

Great Barrier Reef Marine Park Authority

ANNUAL REPORT 1986-87

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Great Barrier Reef
Marine Park Authority
P.O. Box 1379
Townsville, 4810*



Great Barrier Reef Marine Park Authority

**ANNUAL REPORT
1986-87**

COLOUR PHOTOGRAPHS

Great Barrier Reef Wonderland has been built in Townsville as a Bicentennial commemorative project. Part of Wonderland, the Great Barrier Reef Aquarium is an imaginative educational facility which is providing Australian and overseas visitors with new insights into the Reef and its management. Aspects of the Aquarium's development and some of its features are presented in this Annual Report.

Cover

Visitors observe the 'reef on land' from the viewing tunnel. By facing the opposite direction, they can watch reef sharks and other large predators.

Great Barrier Reef Marine Park Authority
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Telephone (077) 81 8811

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Great Barrier Reef
Marine Park Authority
PO Box 1379
TOWNSVILLE QLD 4810

Dear Minister,

In accordance with section 60 of the **Great Barrier Reef Marine Park Act** 1975, I submit the Eleventh Annual Report of the Great Barrier Reef Marine Park Authority on the operations of the Authority for the year that ended 30 June 1987.

Yours sincerely,

A handwritten signature in black ink, reading 'Graeme Kelleher', with a long, sweeping flourish extending to the right.

Graeme Kelleher
Chairman

Senator the Hon Graham Richardson
Minister for the Environment
and the Arts
Parliament House
CANBERRA ACT 2600

THE YEAR IN BRIEF

INCREASED MANAGEMENT THROUGH ZONING

- The Central Section Zoning Plan passed through Federal Parliament in June 1987. When this Plan comes into effect, 60% of the Marine Park will be zoned.
- Management under the Cairns Section Zoning Plan has made the Authority's task of controlling the effects of a rapid and large increase in visitor numbers to the Reef easier.
- Permits issued for tourist operations and facilities in the Cairns Section increased from 39 in 1985-86 to 96 in 1986-87.
- Reefs within day-charter distance from Cairns experienced the greatest increase in pressure of use, necessitating action to collect more detailed and up-to-date site and user information to aid decision making under the four-year-old Zoning Plan and permit system.
- The draft zoning plan for the southern sections (Capricorn and Capricornia) was put to the public for comment from 1 February 1987 to 30 April 1987. An intensive public participation program gained a good response of 327 written representations, some of them from organisations with very large memberships.
- The review of the Capricornia Zoning Plan continued with emphasis on a detailed evaluation of the Replenishment Area zoning at Boulton Reef following its re-opening to fishing on 1 December 1986.

RESEARCH AND MONITORING

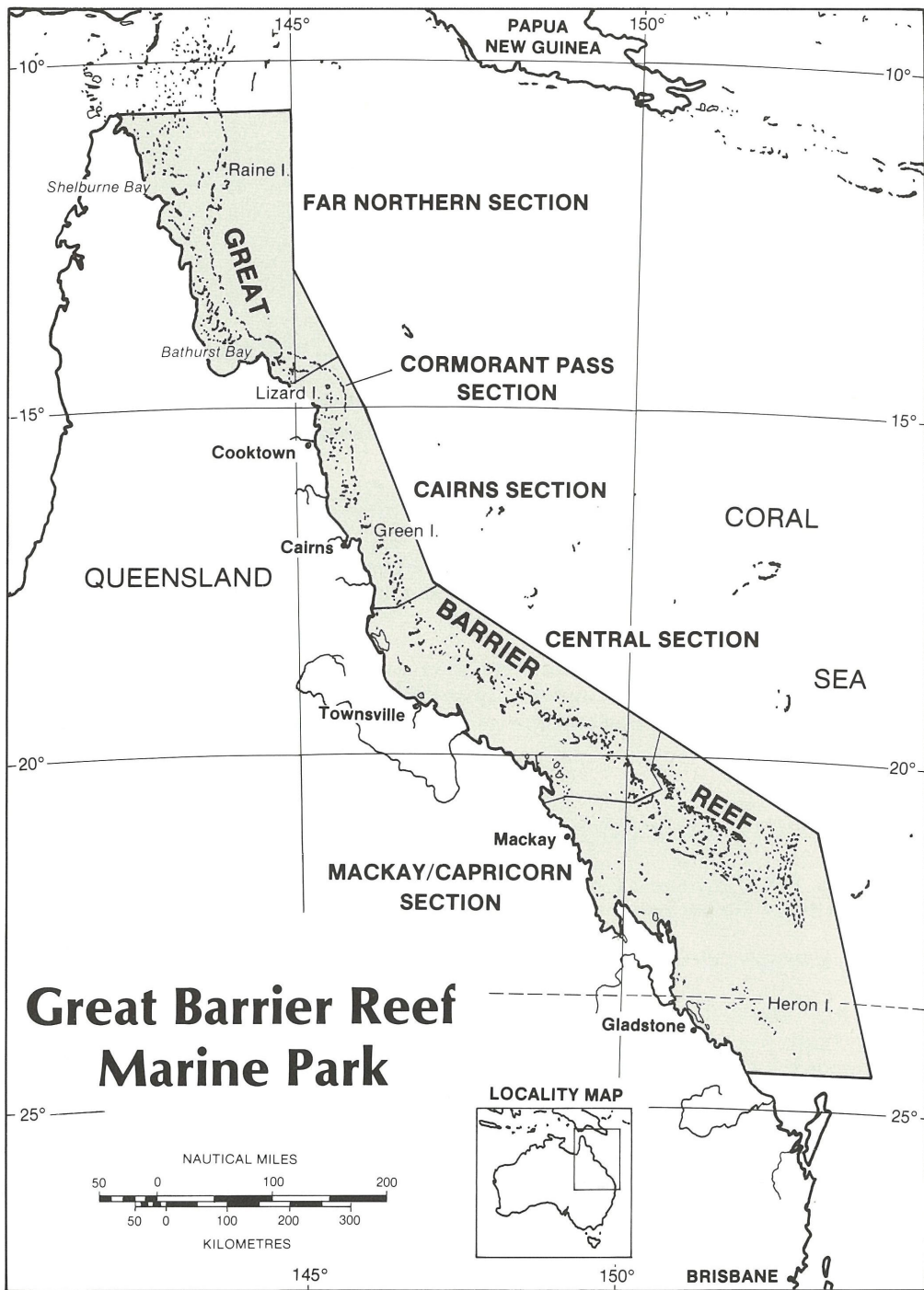
- The Commonwealth granted a further \$764 000 for the continuation of the research program on the crown of thorns starfish.
- Other areas of the research program continued with over 100 projects being managed and supported by a funding program of over \$400 000.

ENHANCING COMMUNITY UNDERSTANDING AND SUPPORT

- Great Barrier Reef Wonderland was opened jointly by the Prime Minister and the Premier of Queensland on 24 June 1987 – on schedule and within budget.
- A video magazine *Reef Report* was included in new audio-visual materials which, together with additional interpretive booklets, brochures and maps, were produced to increase community awareness and understanding of the Reef and the Marine Park. Increased media coverage was also achieved through the press, radio, and television.
- The REEF database was expanded by 500 new entries and now includes 10 000 published items about the Great Barrier Reef. It is available to interested persons throughout the country via the public access system AUSINET.

CORPORATE MANAGEMENT AND SERVICES

- Dr Joe Baker's five-year term as part-time Authority member expired on 30 June 1987. He has been reappointed to 31 December 1987.
- The average staffing level for the year was just under the approved level of 78.
- In the 1986-87 budget, Parliament appropriated \$6 670 000 for the Authority's activities. A further \$1 673 387 were received from other sources, mainly the Queensland Government under cost sharing arrangements for day-to-day management. Expenditure was \$8 225 820 (98.6% of funds available).
- The annual cost of Authority operations per unit area of zoned Marine Park has decreased, at 1986-87 prices, from \$268 per square kilometre in 1981-82 to \$51 per square kilometre in 1986-87.



Great Barrier Reef Marine Park

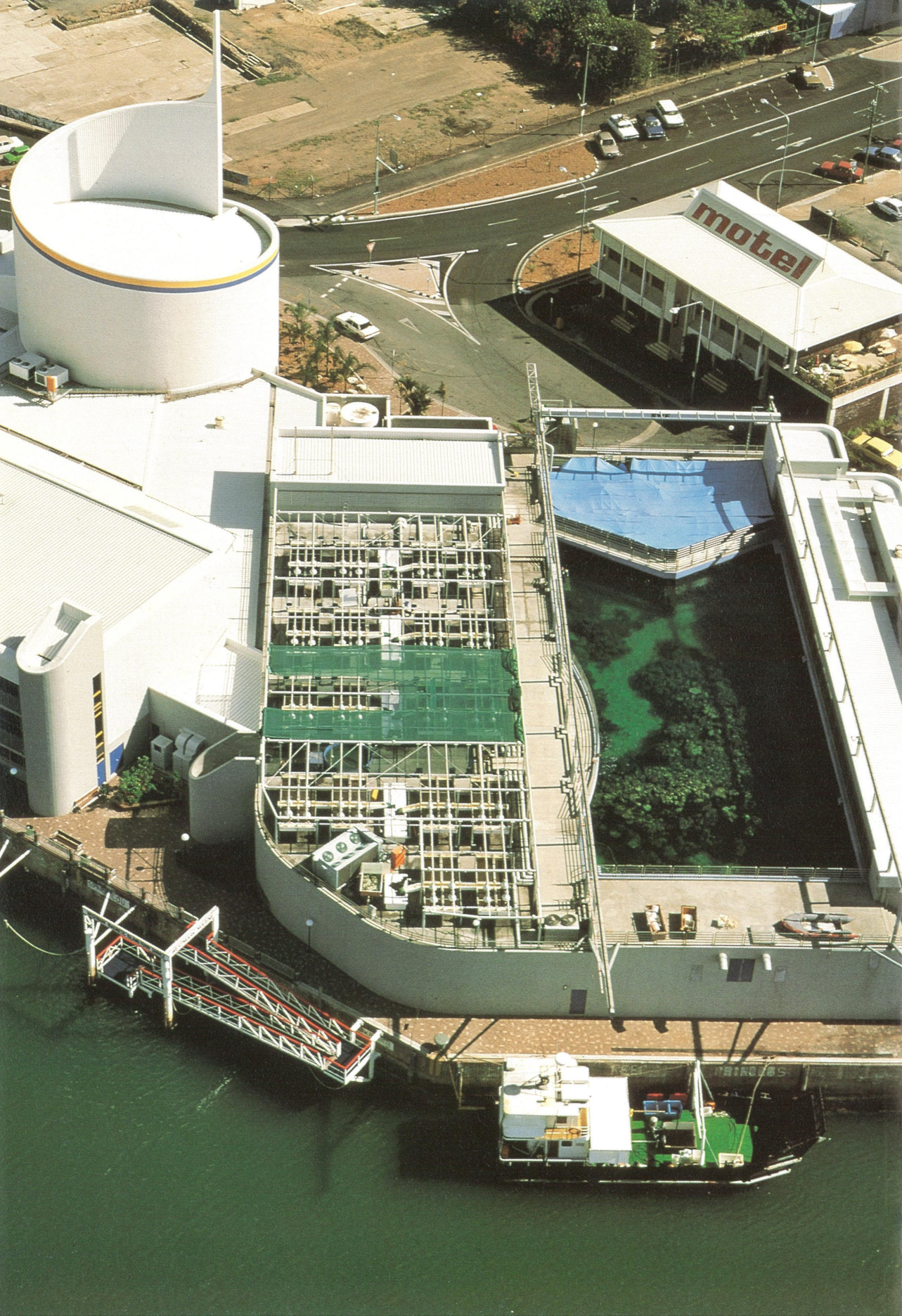


Great Barrier Reef Marine Park Authority

Note: Mackay/Capricorn Section is the amalgamation of the two previous southern sections: Capricorn and Capricornia. The renaming occurred on 24 September 1987.

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FROM THE CHAIRMAN

GREAT BARRIER REEF AQUARIUM

On 24 June 1987 the Prime Minister and the Premier of Queensland jointly opened Great Barrier Reef Wonderland in Townsville. This was the culmination of seven years effort by many people and many parts of the community since I first conceived and put forward the proposal in 1980. The major feature of the project is the Great Barrier Reef Aquarium — by far the world's largest aquarium featuring a living coral reef system. The Authority operates this aquarium, including the very large interpretive area and the theatre, as its principal tool for educating the public about the Great Barrier Reef and the Marine Park.

The reaction of the Prime Minister, the Premier and the public to the completed project has been very enthusiastic. It is essential that a visit to the centre is entertaining and appealing, not only because we wish to reach as many Australians and other people as practicable with our messages about the Great Barrier Reef, but also because the Authority is required to operate the Aquarium at no cost to Government. We are pleased with this requirement because we believe that it will assist us to operate the facility efficiently and creatively. We do hope that the Authority will be allowed to set aside any surplus revenue from the operation of the Aquarium towards future maintenance and upgrading and to the ongoing work of the Authority and that the incentive provided by such arrangements will not be removed by countervailing reductions in funds provided by the Government.

The Aquarium and the whole Wonderland complex are great tourist attractions in themselves. However, we expect and intend them to operate so as to encourage visitors to experience the actual Great Barrier Reef and the Marine Park in a more informed and hence more responsible way. We believe that an understanding of the complex processes that sustain the Great Barrier Reef will lead to increased public support for management designed to ensure that the natural qualities of the Great Barrier Reef will be protected forever.

Opposite: The Great Barrier Reef Wonderland, housing the world's largest coral reef aquarium, Australia's first Omnimax theatre, a branch of the Queensland Museum and a variety of shops, is a unique and imaginative attraction for national and international visitors to Queensland.

ZONING PROGRAM

During the year, the Zoning Plan for the large Central Section of the Marine Park was completed and passed through both Houses of the Commonwealth Parliament. It is expected that the Zoning Plan will come into effect in October 1987. This large Section extends from Dunk Island in the north to just south of the Whitsunday Island group. When the Zoning Plan comes into effect, the zoned area of the Marine Park for which the Authority will be responsible for managing will be increased by 59%. This will have to be achieved with an increase in staffing of only one person. The Queensland marine parks adjacent to the Central Section were zoned concurrently and compatibly under the Queensland Marine Parks Act. This is a significant example of State-Commonwealth cooperation, to the benefit of all Australians.

Two public participation programs were carried out for the development of the zoning plan for the southern sections of the Marine Park, which extend from just south of the Whitsunday Island group to the southern extremity of the Great Barrier Reef Region just north of Bundaberg. The zoning process for these sections initially generated considerable conflict with the commercial fishing industry. The basis for this conflict appeared to be a misconception that the Authority was interested in becoming involved in fisheries management for its own sake. This has never been the case — the Authority involves itself in such management only to the extent necessary to ensure that the ecology of the Great Barrier Reef is protected. In order to avoid such misconceptions in the future, we are developing memoranda of understanding with fish management agencies, which define the functions of the Authority in respect of the responsibilities of such agencies. As with the Central Section, adjacent Queensland marine parks are being zoned concurrently and compatibly with the zoning for these southern sections of the Great Barrier Reef Marine Park.

Many years ago, the Authority proposed, with the support of the Great Barrier Reef Ministerial Council, that the zoning program for the Great Barrier Reef Marine Park should be completed in the Bicentennial year, 1988. This objective was confirmed by the Prime Minister in his policy statement just prior to the recent election. It is expected that the zoning plan for the southern sections will come into effect about the middle of 1988, increasing by 66% the zoned area of the Marine Park.

The completion of the initial zoning phase of the Marine Park does not signal the end of the planning function for the Authority. The rate of change of use of the Marine Park is increasing. The intensity of potential conflict is also increasing. Our experience in the rezoning of the Capricornia Section has shown that the difficulties of planning are similar in the rezoning process to those that exist in the original zoning program. Because of the changes that are occurring and will continue to occur in the use of the Great Barrier Reef Marine Park, the Authority, with the support of the Great Barrier Reef Ministerial Council, is committed to rezoning each section of the Marine Park on a five-year cycle.

COSTS

The annual cost per unit area of zoned Marine Park of carrying out all of the Authority's functions has decreased, at 1986-87 prices, from \$268 per square kilometre in 1981-82 to \$51 per square kilometre in 1986-87. These costs

include all of the functions of the Authority including research and monitoring, planning, education and information, management planning and supervision and administration, as well as the costs of day-to-day management that is carried out by the Queensland National Parks and Wildlife Service which, in carrying out this function, is responsible to the Authority. These improvements in cost-effectiveness have only been possible because of the continued support of most elements of the public, the high degree of cooperation that has been achieved between the Authority and Queensland and Commonwealth Government agencies and by a continued commitment to frugality. The relations between the Authority and the Queensland National Parks and Wildlife Service have become particularly close and productive.

CROWN OF THORNS STARFISH RESEARCH

The past year has been the first full year of operation of the research program on the crown of thorns starfish. Much has been learned about the biology of this animal and its interactions with other parts of the Great Barrier Reef system. In April, the results of the major survey of the Great Barrier Reef that was carried out by the Australian Institute of Marine Science under the Commonwealth Community Employment Program (CCEP) were received. The survey covered 228 of the approximately 2900 reefs of the Great Barrier Reef. About 6% of the reefs in the northern and southern thirds of the Great Barrier Reef were found to be affected by the crown of thorns starfish. About 35% of the reefs in the central third of the Great Barrier Reef were seriously affected and 30% of the reefs in this sector were affected to some extent. These results give no grounds for complacency about this phenomenon. It is essential that the research program is continued at least until it is determined whether or not crown of thorns infestations are caused by or enhanced by human activity and what if any control programs are justified. We cannot predict when this situation may be reached, but the understanding of the phenomenon by the scientific community is increasing rapidly. At its special meeting on 29 May 1987 to consider the results of the CCEP study, the Technical Sub-Committee of the Crown of Thorns Starfish Advisory Review Committee strongly endorsed the Authority's policy that 'until more information is available, direct management intervention in the crown of thorns phenomenon should be limited to tactical control measures designed to protect corals at specific sites of importance for tourism or scientific research'.

A WORLD MODEL

During the year, as in previous years, the Authority received many requests for technical assistance for planning marine resource management programs from countries around the world. The provision of such assistance is not within the functions of the Authority and therefore, such requests are usually refused. However, in exceptional cases, where outside funds are provided and it is believed that the Authority or its personnel would benefit from the experience, assistance can be provided. One such proposal was for the Authority to assist in the establishment of a marine protected area around Ecuador's Galapagos Islands. While these Islands are already listed on the World Heritage List, the surrounding waters have no such protection. It was decided that the Authority's chief planning officer, Mr Richard Kenchington, would assist Ecuador in the preparation of its plans supported by funds provided under UNESCO aid to Ecuador.

All Commonwealth Government agencies are, legitimately, subject to continual efficiency reviews. Alternative ways of achieving national objectives are and should be examined. In this context it is noted that the total amount appropriated for the Authority was \$6 670 000 in 1986-87. We already delegate as many functions as we can to other agencies. Our operation is small in staff numbers and cost, is located near the centre of the Great Barrier Reef, has the support of the majority of Queenslanders and Australians and is regarded as the desirable model by other management resource agencies around the world. This past year has been a very testing and challenging one. The staff of the Authority have responded magnificently.



The Chairman, Gaeme Kelleher, escorts the Prime Minister on an inspection of the Aquarium following the opening ceremony for Great Barrier Reef Wonderland.

GREAT BARRIER REEF MARINE PARK AUTHORITY

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.

ROLE

The Authority is the principal adviser to the Commonwealth Government on the development and care of the Great Barrier Reef Marine Park. Specific functions defined in section 7 of the Act are listed in Appendix A.

The Authority has adopted a statement of its goal and aims that is consistent with the objects, functions and powers specified in the Act. During the year, the Authority re-examined this statement and adopted the following revised version.

GOAL

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

AIMS

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

- To protect the natural qualities of the Reef, whilst providing for reasonable use of the Reef's resources.
- To involve the community meaningfully in the care and development of the Marine Park.
- To achieve competence and fairness in the care and development of the Marine Park through the conduct of research, and the deliberate acquisition, use and dissemination of relevant information from research and other sources.
- To minimise regulation of, and interference in, human activities, consistent with meeting the goal and other aims 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 minimise costs of caring for and developing the Marine Park consistent with meeting the goal and other aims of the Authority.
- To provide for economic development consistent with meeting the goal and other aims of the Authority.
- To adapt the Marine Park and the operations of the Authority to changing circumstances.

MEMBERSHIP

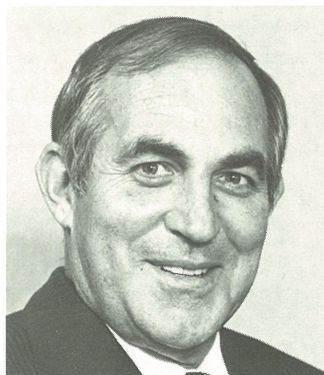
The full-time Chairman (and chief executive) of the Authority is **Mr Graeme Kelleher**, who was reappointed for his second five-year term on 20 December 1984. Mr Kelleher has extensive experience in a wide array of activities concerned with the environment. He was one of the three commissioners on the Ranger 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 an examiner of New Zealand's environment policies for the international Organisation for Economic Co-operation and Development (OECD). He is currently Vice-Chairman, Marine and Coastal of IUCN's Commission on National Parks and Protected Areas (CNPPA).

Sir Sydney Schubert, Co-ordinator-General, Premier's Department, Queensland, is one of the two part-time members. As Co-ordinator-General, Sir Sydney has for many years had primary responsibility for advising the Queensland Government on natural resources development and management, and for implementing the Queensland Government's policies in such areas. Sir Sydney's current five-year term commenced on 1 July 1986.

Dr Joe Baker, OBE, is the other part-time member. Dr Baker is Director of the Australian Institute of Marine Science (AIMS), Townsville. He has had extensive experience in marine scientific research and administration and has been a member of many of Australia's marine scientific advisory bodies. He has been reappointed to 31 December 1987.



Mr Graeme Kelleher



Sir Syd Schubert



Dr Joe Baker

The first appointments to the Authority were made in July 1976 and the first meeting of the three-member Authority was held in August that year.

MEETINGS

During 1986-87, the Authority held the following meetings:

1986		1987	
DATE	LOCATION	DATE	LOCATION
3 July	Townsville	19 February	Townsville
19-20 August	Townsville	17 March	Brisbane
15 October	Bargara	8 April	Townsville
26 November	Yeppoon	24 & 29 April	Brisbane
		17 & 19 June	Cairns

During the course of these meetings, the zoning plan for the southern sections (Capricorn and Capricornia) of the Marine park was drafted and reviewed and the plan for the Central Section was adopted and submitted to the Minister for tabling in Federal Parliament.

Representatives of the Queensland National Parks and Wildlife Service attended several meetings. At the October meeting, the Q.NPWS Director and several of his staff assisted the Authority to review the funding and staffing arrangements for day-to-day management.

THE MINISTER

During the year under review, the **Hon Barry Cohen, MP**, the Minister for Arts, Heritage and Environment, exercised portfolio responsibilities for Great Barrier Reef matters. The Minister convened one meeting of Ministerial Council, held at the Great Barrier Reef Aquarium in Townsville in April 1987.

The Act provides that the Authority *'shall perform its functions in accordance with any general directions given by the Minister not inconsistent with this Act'*. No general directions were given to the Authority during the year.

OFFICE OF THE AUTHORITY

The Authority has 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 carry out essential functions in Canberra.

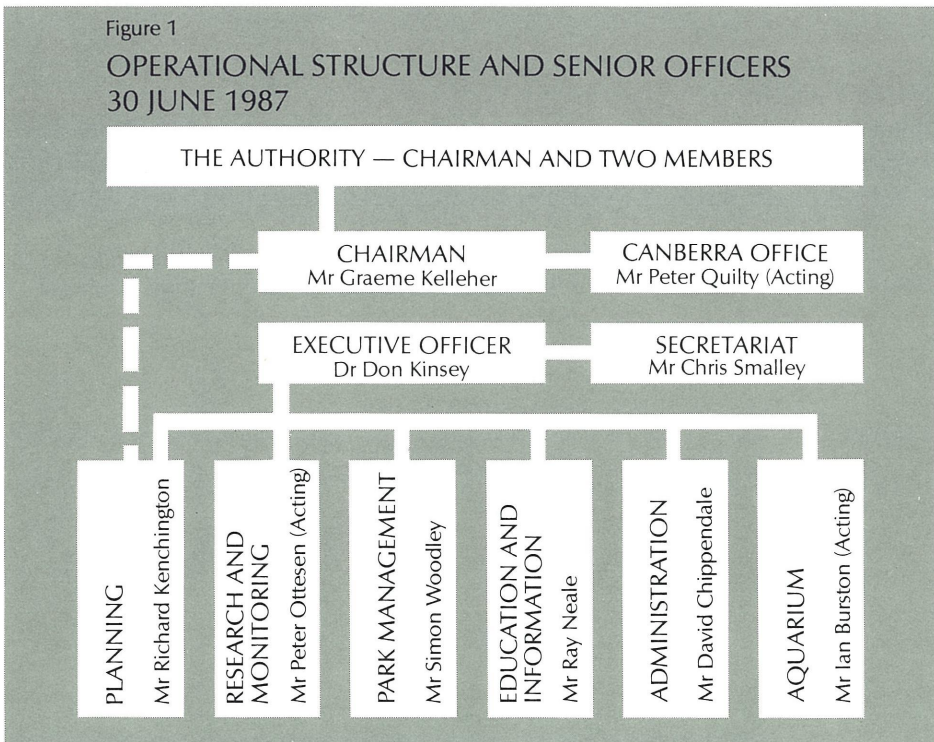
The Canberra office, with a staff of four, serves the Minister, consults with Commonwealth departments whose responsibilities are affected by or affect the Authority's programs, and provides the secretariat for the Great Barrier Reef Ministerial Council.

The Townsville office, with an average staffing level of 72, carries out most of the Authority's operational activities.

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

EXECUTIVE OFFICER

Dr Don Kinsey is the Executive Officer of the Great Barrier Reef Marine Park Authority. He is responsible to the Chairman for the efficient operation of the Townsville office. He is also Secretary to the three-member Great Barrier Reef Marine Park Authority. Staff of Secretariat support him in this role.



GREAT BARRIER REEF MINISTERIAL COUNCIL

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

The twelfth meeting of the Council took place in the theatre of the Great Barrier Reef Aquarium in Townsville on 8 April 1987.

Ministers who attended the meeting were:

- the Hon Barry Cohen, MP, Minister for Arts, Heritage and Environment (Convenor)
- The Hon John Brown, MP, Minister for Sport, Recreation and Tourism
- The Hon Sir Joh Bjelke-Petersen, KCMG, MLA, Premier and Treasurer of Queensland

The Hon Geoff Muntz, MLA, Queensland Minister for Tourism, National Parks and Sport was unable to attend the meeting due to other commitments.

At the meeting, Council:

- noted progress in the development of a management agreement between the Commonwealth and Queensland Governments which will define the detailed arrangements for day-to-day management of the Great Barrier Reef Marine Park, and expressed a desire that the agreement be finalised in the near future
- examined the Three-Year Rolling Program for the management of the Marine Park during the period 1987-88 to 1989-90, and noted in particular that a major review of management strategies would be undertaken
- noted progress on arrangements for the complementary management of lands and waters within the outer boundaries of the Great Barrier Reef Marine Park
- noted progress on the implementation of the Central Section Zoning Plan which was likely [at the time of the meeting] to come into effect July 1987
- noted the program for the zoning of the southern sections of the Marine Park and that 300 public representations had been received during the initial public participation phase in 1986
- strongly endorsed the program that will ensure that the whole Great Barrier Reef Marine Park will be zoned and managed in Australia's Bicentennial year
- reviewed the status of proposed offshore developments in the Marine Park including a floating hotel at John Brewer Reef, offshore from Townsville

- discussed progress on the development of comprehensive Commonwealth legislation which is intended to control such offshore projects all around Australia and the Queensland Off-shore Facilities Act of 1986
- examined the Authority's scientific research and monitoring program and in particular noted the research program on the crown of thorns starfish phenomenon
- noted that the Authority had accepted an invitation from the Ecuadorian Government to assist in the development of management plans for the recently proclaimed Galapagos Islands Marine Reserve
- discussed details of recent legislative initiatives by Queensland relating to the freeholding and development of Great Barrier Reef islands and agreed that previous arrangements for consultation on such issues should continue.

Council took the opportunity to inspect the Wonderland Complex, which at that stage was nearing completion. Ministers commented on the appropriateness of the venue which had been developed as a joint Commonwealth-Queensland Bicentennial Commemorative Project and was soon to be opened jointly by the Prime Minister and the Queensland Premier. They agreed that the project reflected the cooperative roles that both Governments had played in the conservation of the Great Barrier Reef.

Opposite: Divers perform essential daily maintenance, cleaning the acrylic windows, and creating an interesting diversion for Aquarium visitors.



GREAT BARRIER REEF CONSULTATIVE COMMITTEE

The Great Barrier Reef Consultative Committee was established by the Great Barrier Reef Marine Park Act 1975 as an independent advisory body for both the Minister and the Authority. Specific functions defined in section 21 of the Act are listed in Appendix A.

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 consists of members appointed by the Minister for a three-year term and a member of the Authority appointed by the Authority. The current term ends on 3 October 1988 for all members except Mr Kelleher, who as the Authority's appointee, has an indefinite term.

MEMBERSHIP AT 1 JULY 1986

- Professor Kevin Stark (Chairman)
James Cook University of North Queensland
- Dr Robert Bain
Commonwealth Department of Primary Industry
- Mr Dale Bryan
Queensland Commercial Fishermen's State Council
- Mr Paul Eccles
Commonwealth Department of Transport
- Mr Edward Hegerl
Australian Littoral Society and Queensland Conservation Council
- Dr Tor Hundloe
Australian Conservation Foundation
- Mr Graeme Kelleher
Great Barrier Reef Marine Park Authority
- Mr Gordon McKaige
Far North Queensland Promotions Bureau Tourism Task Force
- Mr Andre Maestracci
Hayman Island Resort
- Dr Helene Marsh
James Cook University of North Queensland
- Mr Jim Miller
Queensland Department of Primary Industries

- 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
- Mr Leon Wruck
Heron Island Pty Ltd

During the year, Dr Bain and Mr Bryan resigned as each had ceased his association with the organisation he had been appointed to represent. The Minister appointed:

- Mr Michael Blamey
Commonwealth Department of Primary Industry
- Mr Peter Conaty
Queensland Commercial Fishermen's State Council

on 26 November and 17 October 1986 respectively.

Staff of the Authority's Secretariat provide administrative support for the Consultative Committee. Mr Chris Smalley is the Secretary.

MEETINGS

The Consultative Committee met three times in 1986-87, at Cairns, Yeppoon and in Brisbane. In conjunction with these meetings, members visited islands in the Cairns and Capricorn Sections of the Marine Park.

During the year, the Consultative Committee responded to requests from the Authority for advice concerning:

- zoning of the southern sections (Capricorn and Capricornia)
 - removal of sand from the Marine Park
 - the consideration of mariculture proposals in the Marine Park
- and supplemented its earlier advice on offshore developments.

The Act provides that '*When the Minister is furnished with advice by the Committee, he shall cause particulars of the advice to be given to the Authority*'. No such particulars were provided during the year.

In July and August 1986, a working party of the Committee surveyed user groups of the Cairns Section of the Marine Park to elucidate any problems encountered by users in pursuing their activities in the Cairns Section during the two years since day-to-day management came into effect. The Committee is currently assessing the results of the survey and will consider advising the Minister on this matter.



PLANNING

The Planning Section is responsible for providing a sound basis for the management of the Great Barrier Reef Marine Park. This includes recommending the declaration of sections of the Marine Park; developing and reviewing zoning plans for those sections; and developing and reviewing regulations and other management strategies. Involving the community is an important part of these processes.

On behalf of the Authority, the Planning Section program objectives for 1986-87 were:

- completion of the Central Section Zoning Plan
- preparation of the draft zoning plan for the southern sections (Capricorn and Capricornia) and conduct of the subsequent public participation program
- strategic planning in relation to resource allocation in the Cairns Section
- continued development of and investigation into databases for planning support, mapping and remote sensing.

CENTRAL SECTION

A total of 920 representations were received in the two periods of public participation conducted during the course of development of the Zoning Plan for the Central Section of the Marine Park. The Zoning Plan passed through Federal Parliament in June and it is expected that it will come into operation in October 1987.

This increase in area under protective legislation was incorporated into the Authority's contribution to the revised 'Inventory of Declared Marine and Estuarine Protected Areas of Australian Waters'. The Australian National Parks and Wildlife Service publishes this comprehensive document which lists information concerning all Australian protected waters.

Opposite: Experienced aquarium staff prepare to catch a shark. Quick reflexes and caring hands were needed for the transfer of sharks and other predators from an aquarium on Magnetic Island to their new home at Wonderland.

SOUTHERN SECTIONS

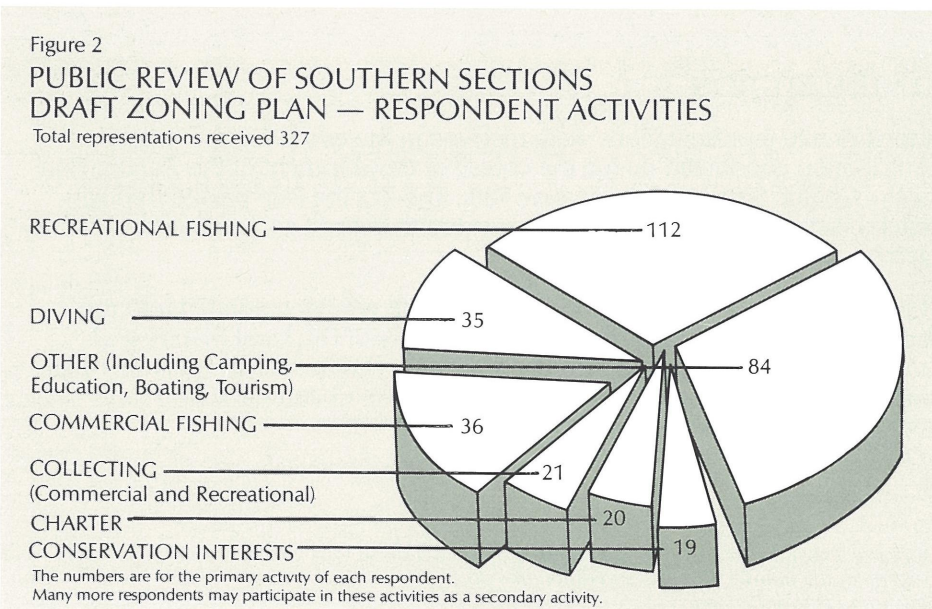
The first phase of public participation in the zoning of the southern sections (Capricorn and Capricornia) was conducted from April to June of 1986; 301 representations were received from interested members of the public and from organisations involved in operations in the area.

On the basis of information received during the program, a draft zoning plan was prepared and then made available for public comment during the period from February to April 1987. As with the first phase of public participation, informative publications were produced to assist respondents with preparation of their comments about the proposed zoning.

A total of 327 representations were received from the public in response to this second call for comments, the majority of which were made on the mail-back brochure. Mail-back brochures had previously been used successfully in the public participation programs conducted during the zoning process for both the Far Northern Section and Central Section. Figure 2 shows the breakdown of respondents by major activity.

Two areas of particular interest to users of the southern sections are the Swain Reefs, important to charter boat operators and commercial fishermen, and the Capricorn and Bunker groups of islands, reefs and shoals, which are extremely popular for camping, diving, boating and recreational fishing. The Capricornia Section Zoning Plan, covering the area of the Capricorn and Bunker Groups, will remain in operation until the new zoning plan, covering both the Capricorn and Capricornia Sections, comes into effect.

Staff of the Planning Section have continued to liaise with relevant Queensland and Commonwealth Government Departments during the finalisation of the zoning plan which is expected to be in operation by mid-1988.



CAIRNS SECTION

Major increases in visitor numbers to the Cairns area and the rapid development of high speed catamaran services for tourist day trips have increased pressure of use since the Cairns Section Zoning Plan was prepared in 1982-83. The Zoning Plan and the permit system have provided the basis for the resolution of issues involved in the allocation of resources to meet the range of demands, but more detailed and up-to-date site and user information and criteria are required to aid the assessment process.

A GBRMPA-Q.NPWS working group has been established to develop and recommend suitable criteria to improve decision making with regard to the use of reefs within day-charter distance from Cairns.

The approach aims, within the framework of the existing Zoning Plan, to identify the types and levels of permitted activities which can be supported at each reef site. The initial study will focus on those reefs from Norman Reef in the north to Scott Reef in the south with the following objectives:

- analyse user pressures and the potential for future use
- identify existing problems and resolutions
- develop sub-regional planning concepts which can be applied to other intensively used areas, eg, reefs off the fast developing centre of Port Douglas.

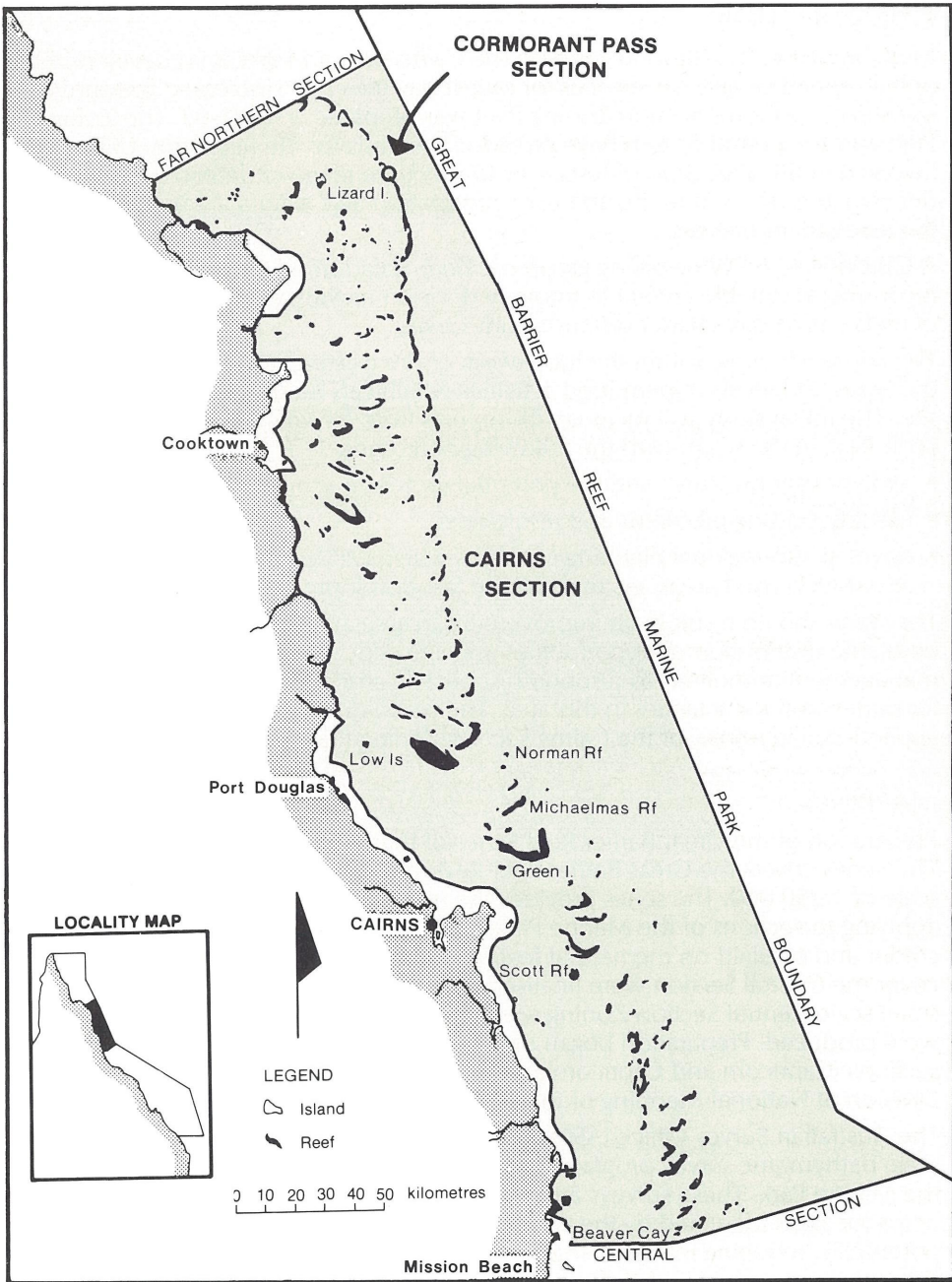
The study should result in an improvement to assessment techniques, ensure an equitable distribution of opportunities and site allocation and allow management authorities to respond responsibly and confidently to applications for permission for activities in this area. The techniques will be refined and applied during review of the Cairns Section Zoning Plan in the future.

MAPPING

Preparation of the Great Barrier Reef Series of maps continued during the year. This series covers the Great Barrier Reef Region with 26 individual mapsheets at a scale of 1:250 000. The series provides the mapping base for all zoning plans applying to sections of the Marine Park, each zone type denoted by a different colour and overlaid on the natural features of the area. The eight maps which cover the Central Section were finalised over the last 12 months. In addition, a small scale Central Section Zoning Map and a map for the Introductory Brochure were produced. Preparation began of ten 1:250 000 scale maps for the southern sections (Capricorn and Capricornia); this will involve assistance from the Division of National Mapping of the Department of Resources and Energy.

The Australian Survey Office (ASO) and the Authority continued with a large scale bathymetric survey program for selected reefs in the southern sections of the Marine Park. These surveys are designed to provide detailed, highly accurate maps for areas identified by the Authority and Q.NPWS staff as currently, or potentially, requiring intensive management.

The Authority cooperated with the Queensland Department of Mapping and Surveying in the production of a new 1:100 000 scale map base of the Reef by making available the ASO-produced LANDSAT image maps for selected areas.



REMOTE SENSING

During the year Authority staff continued both direct and indirect involvement in projects and activities which required application of remote sensing data analysis to the marine environment. This followed the successful development by CSIRO, in collaboration with the Authority and ASO, of the BRIAN (Barrier Reef Image ANalysis) system for mapping and analysing shallow water features and its transfer to the private sector which is now marketing it internationally.

The Townsville office took delivery of a micro-BRIAN remote sensing image analysis microcomputer to be used in the analysis of Coastal Zone Colour Scanner (CZCS) imagery for the crown of thorns research project 'Relationships between *Acanthaster* outbreaks and water mass characteristics in the Great Barrier Reef Region'. A total of 25 images of data acquired over the past ten years were purchased for this analysis from the US National Oceanic and Atmospheric Administration (NOAA) in order to chart seasonal and annual changes in chlorophyll-a, as an indicator of phytoplankton distribution; and in water colour, as an indicator of water turbidity in Great Barrier Reef waters.

Some operational problems in using the system were identified. The transfer of image data from computer tapes to the system proved to be difficult and time consuming necessitating the development of new software for the Authority's main VAX 11/750 computer. This took some time to achieve and seriously affected project timing. The ASO is now assisting by providing image subsets in the required format for analysis. The most cost-effective solution would be the acquisition of a dedicated tape drive unit. This will be investigated for 1987-88.

The system was also used throughout the year by Dr D Kuchler of the CSIRO for the project 'Spectrographic analysis of reef features'.

Authority staff contributed to the compendium report on tropical remote sensing for the Australian Marine Sciences and Technologies Advisory Committee. It is expected that the final report, to be edited by Dr K McCracken of the CSIRO, will be available before the August 1987 ANZAAS meeting.

Mr D van R Claasen attended an international seminar on Remote Sensing Applications in Coastal Zone Management and Environmental Monitoring in Dhaka, Bangladesh, on 18-26 November 1986, at the request of the Economic and Social Commission of Asia and the Pacific (ESCAP) Regional Remote Sensing Program. He presented a paper, written jointly with Dr D Jupp of the CSIRO Division of Water Resources Research, entitled 'Mapping shallow waters — the application of remote sensing techniques in coastal zone management: the Great Barrier Reef Region, Australia' and was a member of a panel assessing the results of three pilot studies applying remote sensing to coastal zone management covering Sri Lanka, India/Bangladesh and Thailand. A report was submitted to ESCAP and the Authority.

The Authority contributed \$20 000 to the Northeast Australian Satellite Imagery System (NASIS) Consortium (\$60 000 is budgeted over three financial years). Other members of the Consortium are CSIRO, the Queensland Department of Mapping and Surveying, AIMS and JCU. The functions of NASIS will be acquisition, processing, storage and dissemination of remotely sensed data. It will greatly assist natural resource science and management.

AUTOMATED DATA PROCESSING

The Authority's mini-computer, a VAX11/750, now supports a number of major database applications. These include financial management, permits, aerial surveillance and contacts/ mailing lists. Expansion of other existing databases and development of new database applications are planned, particularly in the area of natural resource inventories of the Reef and related socio-economic data.

The number of users seeking access to these databases is increasing rapidly, especially from Q.NPWS Head and Regional Offices. An impetus for this increase is the upgrading of data communications between remote user sites and the Townsville mini-computer. Connection to Telecom's Auspac network service has recently been carried out in the Townsville and Canberra offices of the Authority. This service, with some additional communications equipment, will greatly expand remote access as charging is independent of distance.

The expanded services, however, will have severe impacts on the VAX mini-computer performance, as it is already becoming overloaded with in-house applications. Additional computer resources will be required. Investigations as to the most cost-efficient strategy are currently being undertaken.

The Authority's Wang word-processing system was sold and replaced by an AT and T 3B2 microcomputer and is used exclusively by the word-processing staff. Australian-developed networking software, installed on the VAX and 3B2 microcomputer, has allowed the very effective exchange of documents between the two machines.

PARK MANAGEMENT

The Park Management Section aims to achieve cost-effective implementation of zoning plans, regulations and other management strategies in conjunction with Queensland Government agencies and others. The legal and strategic framework for management is provided by the Act, zoning plans and regulations. Under a 1979 agreement between the Commonwealth and Queensland Governments for a complementary approach to the management of the Marine Park, the Authority is responsible for the development of management planning, policy, programs, and objectives, and general oversight of Marine Park management. Queensland National Parks and Wildlife Service (Q.NPWS) is the principal agency responsible to the Authority for day-to-day management of the Marine Park. Other agencies with ancillary responsibilities for day-to-day management are the Queensland Boating and Fisheries Patrol (QBFP), Queensland Water Police, the Australian Federal Police and the Federal Sea Safety and Surveillance Centre.

Important industries such as tourism and fishing, as well as popular recreational activities such as diving and fishing, depend on sound management of the Reef's resources.

The Authority and Q.NPWS set and largely achieved the following broad objectives for the Park Management program in 1986-87:

- consolidate management of the Cairns, Cormorant Pass and Far Northern Sections
- prepare for management of the Central Section
- conduct interim management over the Central and Capricorn Sections
- participate in the review of the Capricornia section
- develop policy in relation to offshore developments
- establish an integrated aerial surveillance system for the whole Marine Park
- complete a review of day-to-day management operations.

The following part of the report focuses on activities by the staff of the Authority rather than detailed day-to-day management operations carried out by Queensland Government agencies on behalf of the Authority.

CAIRNS, CORMORANT PASS AND FAR NORTHERN SECTIONS

The operations of these three sections are combined and coordinated from the Far Northern Region Office of Q.NPWS in Cairns.

Greatly increased numbers of visitors to the Cairns area and the growth in associated services placed heavy pressure on day-to-day management resources. Despite these pressures, some of the more significant management activities undertaken were:

Michaelmas Cay and Reef Management Plan

This first complementary plan for a cay and reef in the Region was finalised during the year by staff of the Authority and Q.NPWS, in consultation with user groups, individuals and relevant authorities. Following release of the plan, management staff presented it to a public meeting of tourist operators in Cairns. Public reaction has generally been favourable, although some tourist operators have requested less restrictive controls on waste discharge and levels of use.

Tourist Operations

Public meetings were held with tourist operators to sort out conflict of use issues for Beaver Cay, Norman Reef and Low Isles.

A study of noise impact and safety factors of seaplanes at Green Island led to restriction of seaplane operations near the beach. A long term solution to the problem of landing passengers at Green Island is still needed and is being pursued by Q.NPWS in consultation with Cairns Port Authority.

Q.NPWS increased user contact, particularly with commercial operators and other agencies, in response to increases in reef tourism and recreation. A major project consisted of five Reef Tourism Seminars at Port Douglas, Cairns and Mission Beach for a total of 200 front line staff.

In January 1987, an office of Q.NPWS was opened in Innisfail and a ranger transferred to that area. A small field base was also established on Flinders Island during 1986.

There was a substantial increase over the previous year in the number of permits issued for tourist operators and facilities — 96 compared with 39. These all involved substantial work by staff of both Q.NPWS and the Authority in assessment, site preparation, liaison with other users and extension work.

Other Management Developments

Public contact for extension, interpretation and enforcement purposes and other management activities was assisted by the acquisition of the 12 metre vessel *Caretta* and the 7 metre vessel *Syrinx*. However resources continued to be insufficient for detailed management of the Far Northern Section. A major problem is developing because of the inability to follow up allegations of infringements by prawn trawlers in the Section, particularly in the Marine National Park 'B' Zone transect near Shelburne Bay.

Shelburne Bay was also the site for a proposal to construct an outloading facility for export of silica sand. The Authority refused permission to proceed with this proposal after having regard to all the considerations available to it and in the light of the Commonwealth Government's decision that the facility would not be allowed to be used for export of silica sand from Shelburne Bay.

The permit conditions for traditional hunting of dugong were eased as a result of studies undertaken for the Authority by researchers at James Cook University and the trial permit system. Q.NPWS staff visited Aboriginal and Islander communities to advise them of the permit amendments which included a lifting of quota limits previously thought necessary.

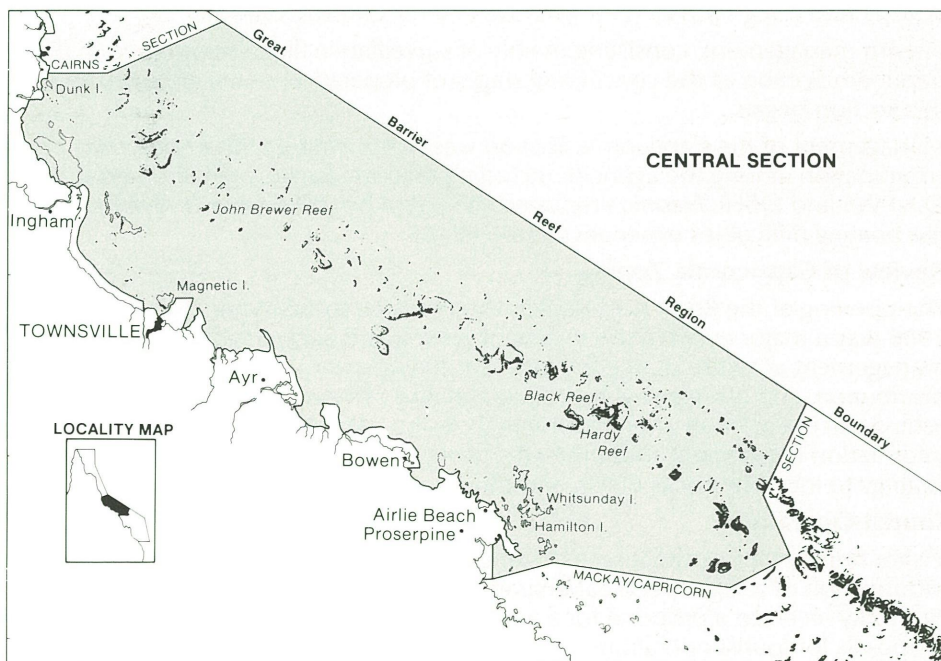
CENTRAL SECTION

Interim management continued in 1986-87 while the Zoning Plan was finalised and tabled in Parliament. Management activities mainly related to control of waste discharge and offshore structures. Continuing preparations for the introduction of the plan included the identification and contact of individuals and organisations likely to require permits.

Tourist Operations

The popular Whitsunday Islands have been the site for much of the management activity in this Section.

- Arrangements for waste discharge from Hamilton Island continued to be unsatisfactory. The Authority gave the operator an extension of time to undertake engineering works while, at the same time, imposing stringent reporting requirements to ensure compliance. This action required close liaison with the Queensland Water Quality Council for a coordinated approach to the problem.
- A helicopter accident at Black Reef in 1985 has resulted in the Authority and others being served with two writs allegedly for negligence giving rise to a breach of duty of care.



- Hardy Reef continued to be the favoured outer-reef site for tourist operations but overcrowding is fast approaching and these operations will need to be coordinated.

Two proposed developments off Townsville required lengthy assessment of their applications for permits.

- The proposal for the floating hotel at John Brewer Reef was the first of its kind to be considered by the Authority and required the development of new types of policy guidelines and permit conditions over the past two years. Construction of the hotel is nearing completion and it is expected to arrive at its destination in December 1987. Over the past year, the proponents, Barrier Reef Holdings Ltd, satisfied the insurance requirements and posted the required substantial bond primarily for protection against removal costs or environmental rehabilitation. Other requirements to be met before the project comes into operation include a resort management plan and an environmental monitoring program.

Proposals were also received to expand the existing *Reef Link* operation's use of John Brewer Reef including a new set of pontoons. The Authority is therefore faced with the need to ensure integration of use at that site.

- The proposal for a resort development, *Magnetic Keys*, at Nelly Bay on Magnetic Island involves reclamation of part of the seabed in the Marine Park to above low water mark which would have the effect of changing the Park boundaries. This would require lengthy legal action. During the past year, the proponent began to redesign the proposal with the aim of avoiding legal difficulties. Work began on the environmental impact assessment of the project.

SOUTHERN SECTIONS (CAPRICORN AND CAPRICORNIA)

Interim management, consisting mainly of surveillance flights, continued in the Capricorn Section as the concluding stages of preparation of the zoning plan for this Section began.

Management of the Capricornia Section was consolidated with improved coordination among the agencies including the introduction of joint patrols by Q.NPWS and QBFP. *Nautilus* replaced the patrol boat *Protector II*, overcoming the boating difficulties experienced in 1985-86.

Review of Capricornia Zoning

The opening of the Boulton Reef Replenishment Area to fishing on 1 December 1986 was a major event in the review of zoning and also a highlight of management activities during the year. Underwater surveys of fish numbers and distribution, and fish tagging, preceded a period of intensive monitoring of fishing catch and effort after the opening. As the data are analysed valuable information is emerging about the effectiveness of using replenishment areas as a strategy to increase stocks of fish and other marine animals.

Tourist Operations

Visitor numbers to Lady Musgrave Island and Reef have increased following the introduction of a high speed catamaran service from Bundaberg in 1985. The Authority received a proposal for a floating hotel at this reef and several other proposals for tourist operations.

Fitzroy Reef is the site for another floating hotel proposal received during the year. The proposal was advertised seeking public comment and preparation of an environmental impact statement was directed by the Minister.

At Heron Island there have been longstanding problems resulting from the increased scouring of sand from the reef flat into the harbour. If left unsolved, this scouring could lead to progressive erosion of the island. The Authority is considering, in conjunction with Queensland Government agencies, a proposal by the resort operator to carry out works to provide a long term solution including dredging the harbour, modifying its shape, undertaking remedial work on the existing bund wall and constructing a jetty.

REGION-WIDE OPERATIONS

Surveillance

The Authority, as the major user of the COASTWATCH surveillance program for the Great Barrier Reef, undertook a comprehensive review of its operation. The result was a recommendation that the operation be integrated with the surveillance activities in the Q.NPWS day-to-day management program. If implemented, this would mean Q.NPWS staff would be observers on surveillance aircraft supplied by COASTWATCH servicing the Region from a date to be determined in 1987-88.

Communications

Progress towards improved communications for management between the Authority and Q.NPWS and other agencies occurred on several fronts.

- Communications software and hardware requirements were determined to allow better access by Q.NPWS day-to-day managers into the Authority's databases. These should be put into operation before the end of 1987.
- Databases of surveillance and permit information were established over the past two years. Improved access to these by both Authority and Q.NPWS staff will lead to greater efficiency in assessing permit applications and in handling other management matters.
- A successful exchange of staff occurred between Q.NPWS Rockhampton office and the Authority's Townsville office. More exchanges are being considered for 1987-88. The application of expertise and experience and the improved understanding of agency responsibilities are the benefits of such exchanges.
- Production began of an in-house newsletter, *Management News*, which aims to give all management staff a summary of developments and issues about every six weeks or so.
- The Management Co-ordinating Committee, consisting of officers of the Authority and Queensland Government agencies with Reef responsibilities, established a working group to report on ways to integrate the day-to-day management operations of Q.NPWS and QBFP in the Marine Park.
- Workshops were held between staff of Q.NPWS and GBRMPA on management issues and programs.

Review of Day-to-Day Management

A comprehensive examination of objectives, achievements and deployment of staff and other resources which began in January 1986 was completed later that year. Recommendations from this review were taken into account when the 3-Year Rolling Program for 1987-88 to 1989-90 was prepared.

Figure 3

ESTIMATED EXPENDITURE ON DAY-TO-DAY MANAGEMENT OF THE GREAT BARRIER REEF MARINE PARK 1986-87 AND 1987-88

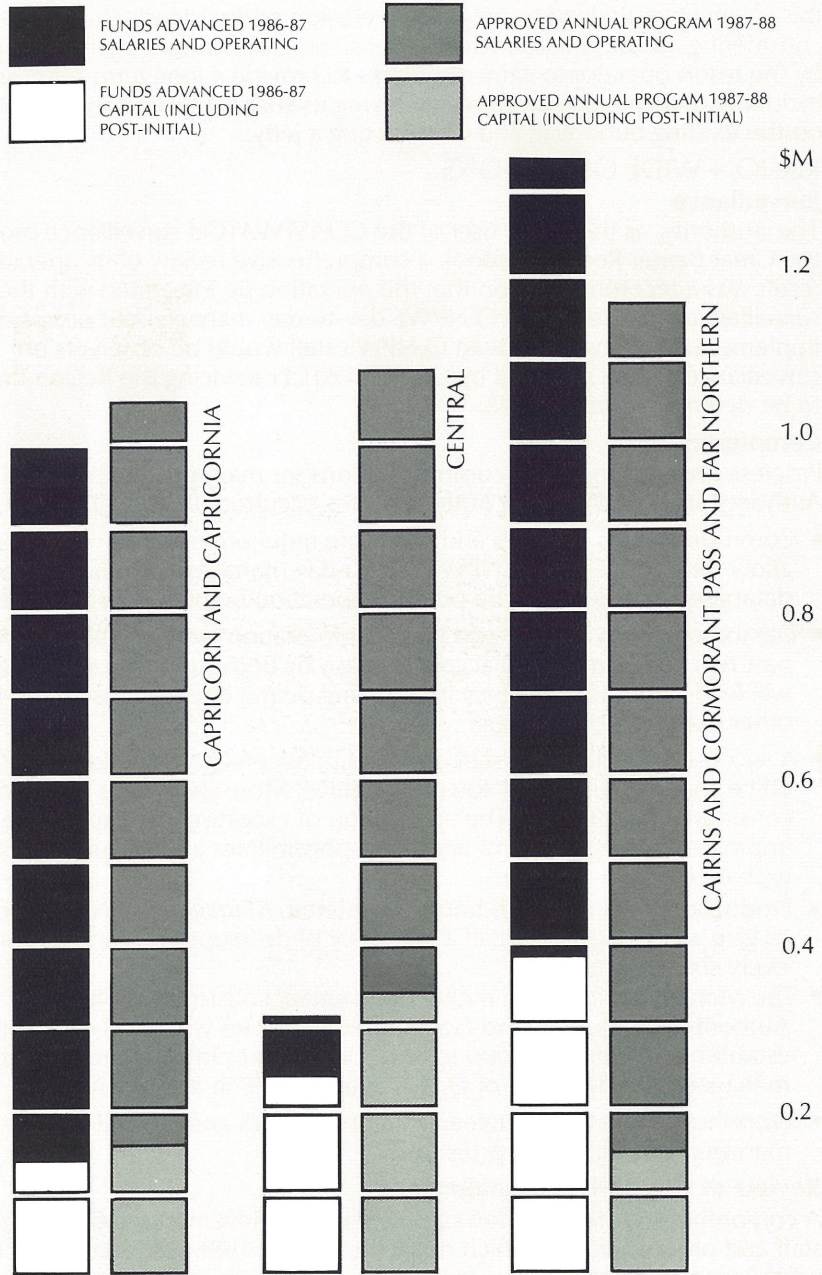


Figure 4

COST SHARING FOR DAY-TO-DAY MANAGEMENT OF THE GREAT BARRIER REEF MARINE PARK 1986-87 AND 1987-88

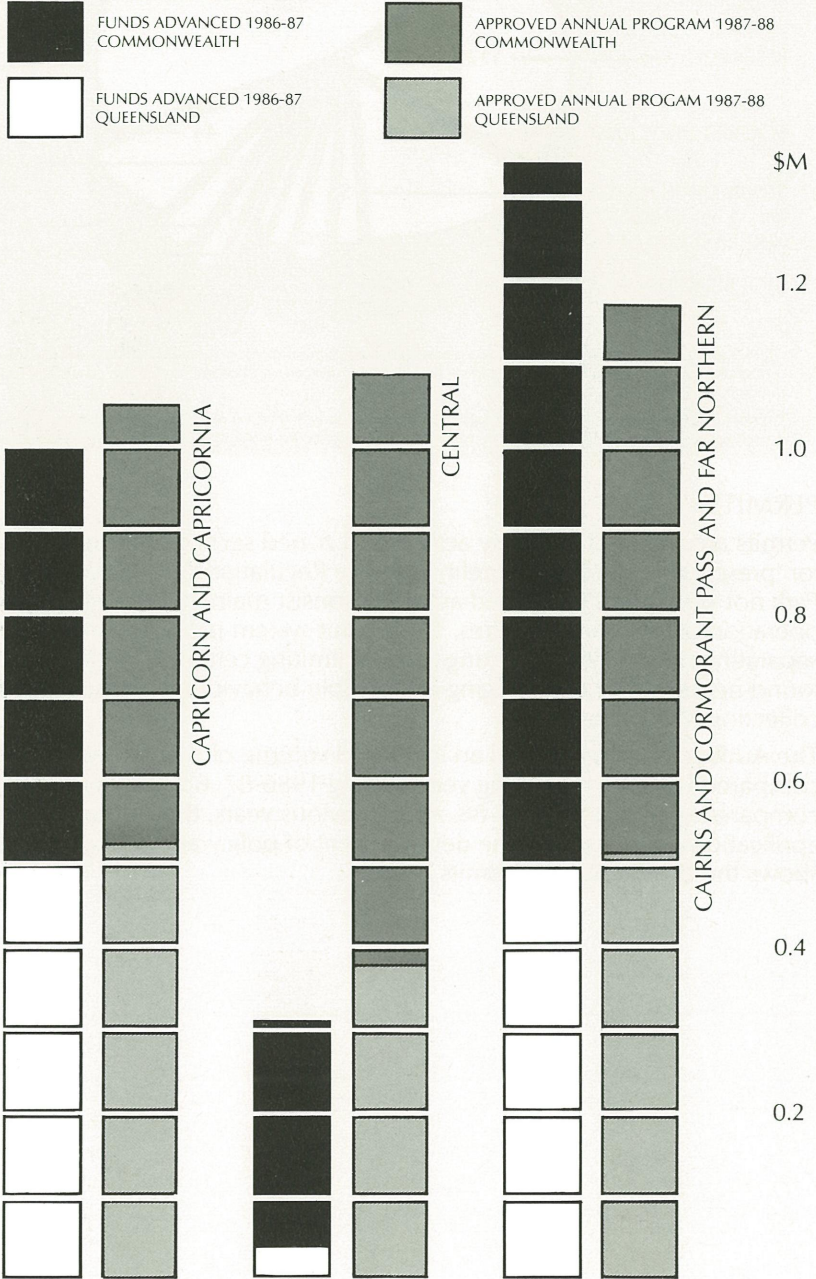
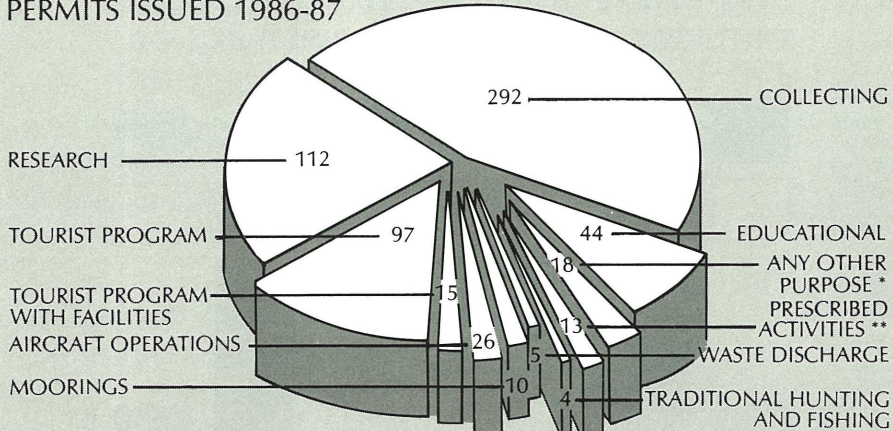


Figure 5
 PERMITS ISSUED 1986-87



* 'Other' includes permits for salvage items and removal from wrecks, construction of platforms for research and other purposes, control and collection of crown of thorns starfish, shell dredging, underwater photography/filming, giant clam mariculture and camping.

** 'Prescribed Activities' are defined in the Regulations and include such things as placing and operating structures on the Reef, operating vessels long-term in one location, various types of engineering works and the demolition of structures and works.

PERMITS

Permits are required for many activities in zoned sections of the Marine Park and for 'prescribed activities', as defined in the Regulations, in sections of the Marine Park not yet zoned. Prescribed activities consist mainly of the establishment and operation of offshore structures. The permit system provides a means of separating potentially conflicting uses; of limiting certain activities when this is found necessary; of encouraging responsible behaviour in reef users; and of collecting data on reef use.

The Authority again handled an increased volume of permit applications compared with the preceding year. During 1986-87, 636 permits were issued, compared with 521 in 1985-86. As in previous years, the Authority considered applications that required the development of policy and procedures. Figure 5 shows the breakdown of permits issued.

POLICY

Several major issues arose during the year as the Authority pursued its management objectives.

Revenue Raising

Increasingly stringent budget outlays together with questions of equity in the use of the Reef's resources led to an examination of options for revenue raising, the benefits and costs, the principles involved (eg, the 'user pays' principle) and possible mechanisms. Options being examined include payment for services such as the provision of rangers on tourist boats, for the exclusive use of reef sites and for the issue of permits. Programs for revenue raising through the sale of publications and admission to the Great Barrier Reef Aquarium are already in place.

Volunteer Programs

Because of the apparent success of volunteer programs which support overseas parks services and some Australian bodies in both the provision of labour and fundraising, a study has begun on the possible introduction of similar programs by the Authority. The experience of organisations with successful programs shows a clear requirement for the provision of sufficient staff and facilities to organise, train and manage the volunteers. The Aquarium is the first area of the Authority's operations in which a volunteer program is likely to be established.

Site Allocation

More tourist operators wanting to use prime sites on the Reef led to an investigation of the issues, principles and possible mechanisms involved in the equitable allocation of reef sites to competing users.

Artificial Reefs

Several applications to locate artificial reefs and wrecks in the Region led to the development of a draft policy paper which discusses concerns such as liability, ownership and responsibility for maintenance. Policies for artificial reefs are expected to be finalised shortly and applied initially in the context of permits for offshore tourist developments.

Coral Sand

The Authority came under increasing pressure to allow the use of coral sand from within the Marine Park for beach replenishment, marine fill and aquariums. However, section 38 of the Great Barrier Reef Marine Park Act prohibits such use as it falls within the definition of operations for the recovery of minerals. The Authority is examining possible sources of sand outside the Marine Park.

Floating Hotels

In response to concern expressed by the Minister and sections of the community over the proliferation of proposals for floating hotels in the Region, the Authority began a review of the policy aspects that should be considered in assessing applications for permits for such developments.

Legislation

The Authority has been closely involved in the development of comprehensive Commonwealth legislation which will control offshore installations all around Australia and is closely following the development of arrangements between this legislation and the Queensland Off-shore Facilities Act of 1986.

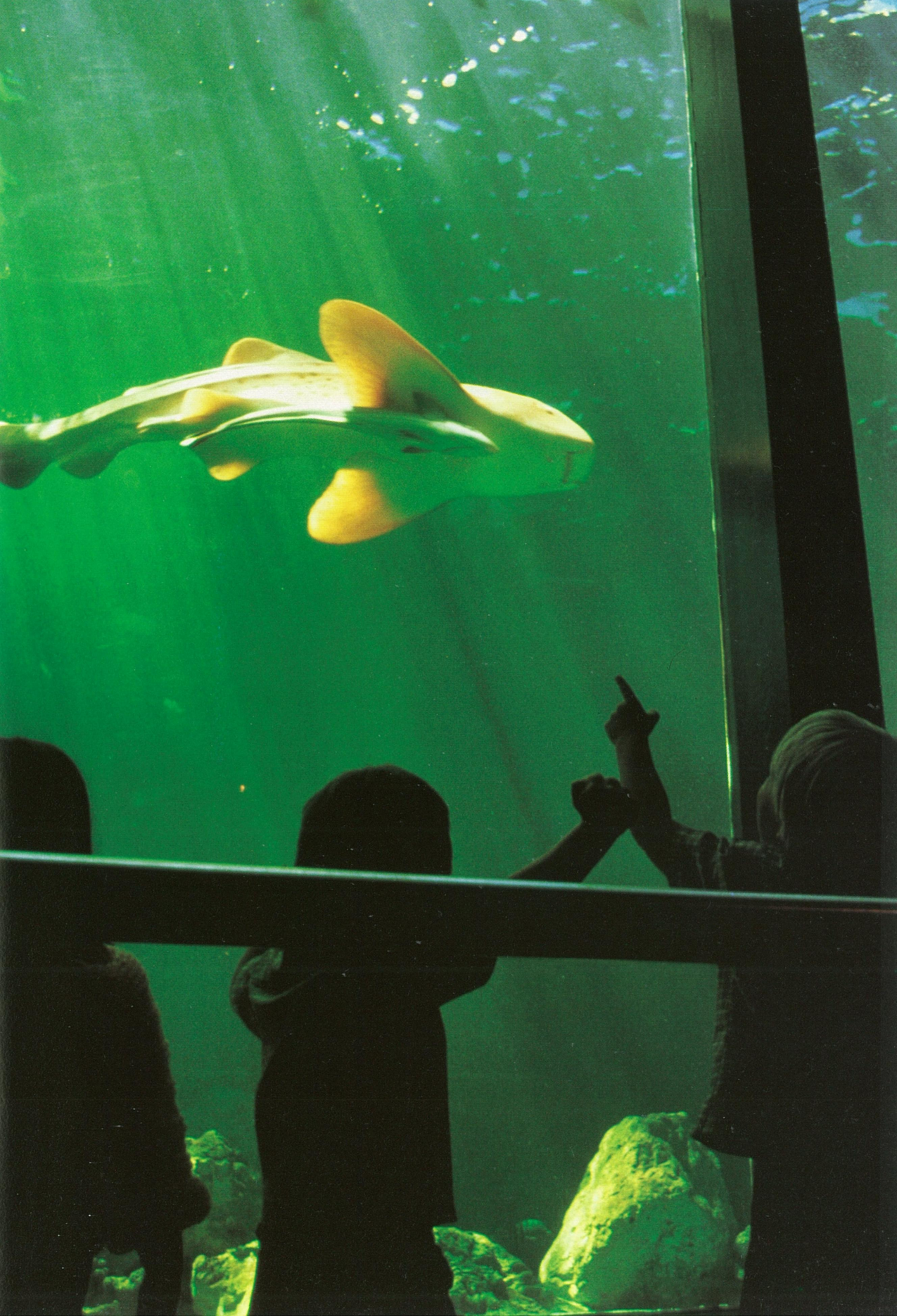
The Commonwealth Sea Installations Bill provides for the application of Commonwealth law beyond the Territorial Sea to offshore structures and is expected to complement the provisions in the Great Barrier Reef Marine Park Act and to regulate aspects of offshore operations not covered by that Act eg, customs, quarantine and taxation. It also provides for the application of State law (eg, with respect to health and safety) as Commonwealth law beyond the Territorial Sea. It is expected to be considered by Parliament during 1987-88.

The Queensland Off-shore Facilities Act provides for the application of relevant Queensland laws to offshore facilities in the adjacent waters of Queensland.

Liability and Duty of Care

What are the implications for the Authority of recent court decisions on liability relating to both negligence and the general duty of care in common law? An examination of the serious issues raised by this question has begun.

Opposite: SHARKS! Needing little explanation, the predator tank captures the imagination of most Aquarium visitors and is a favourite with children.





RESEARCH AND MONITORING

The Research and Monitoring Section obtains and interprets information to assist in the planning, administration and education functions of managing the Marine Park. The Authority is empowered to commission research or undertake research itself: in practice most research is carried out by outside agencies such as universities, government bodies or private consultants under contracts with the Authority. Section staff manage these projects, from the idea stage through to the final report evaluation and dissemination of results. The Section also reviews project applications for Marine Sciences and Technologies Grants based on a criterion of relevance of proposals to the effective management of the Marine Park and the resultant assessments are considered by the grant body, the Australian Marine Sciences and Technologies Advisory Committee (AMSTAC). Monitoring strategies are being developed by the Section so that long term data on the Reef and its use can be collected and changes detected.

Research priorities are defined within the annual research program which is broad based with research being carried out in marine biological and physical sciences, and the social sciences. Many of the projects are multidisciplinary and some are closely integrated to provide maximum benefit and efficiency of research.

In 1986-87, 143 projects were funded and managed; 67 of these were new proposals. Financial support was given to 97 projects and the remainder continued but received no funding during the year. Figure 6 shows the breakdown of projects which were managed during 1986-87 by number of projects and Figure 7 the breakdown in dollar terms. A list of projects is to be found in Appendix E.

The Authority supported 17 projects through the Augmentative Research Support Grants Scheme which promotes graduate research in the Great Barrier Reef Region. There were 33 applications for these grants. The maximum grant offered in 1987 was \$900 and the total funding was \$11 807. The support for these grants is included in Figures 6 and 7.

To ensure that the objectives of research can be met at the minimum possible cost and through use of the best expertise, and also to avoid the possibility of duplication, the Section liaises regularly with other agencies in the region and at the national level. Close working relationships exist with, amongst others,

Opposite: Algal turf scrubber – in this technology developed by Dr Walter Adey of the Smithsonian Institution, the marine algae remove excess nutrients from the Aquarium's water and control oxygen levels and acidity.

Figure 6
**NUMBER OF PROJECTS IN PROGRESS
 BY PROGRAM AREA**

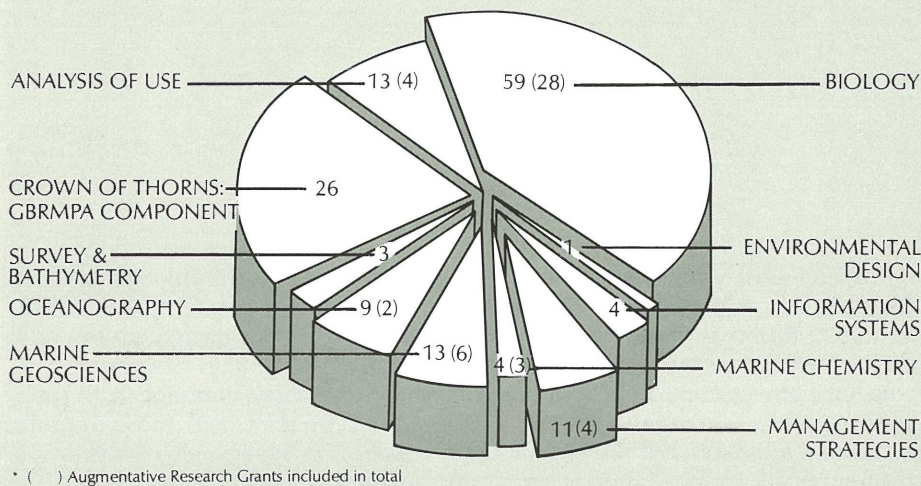
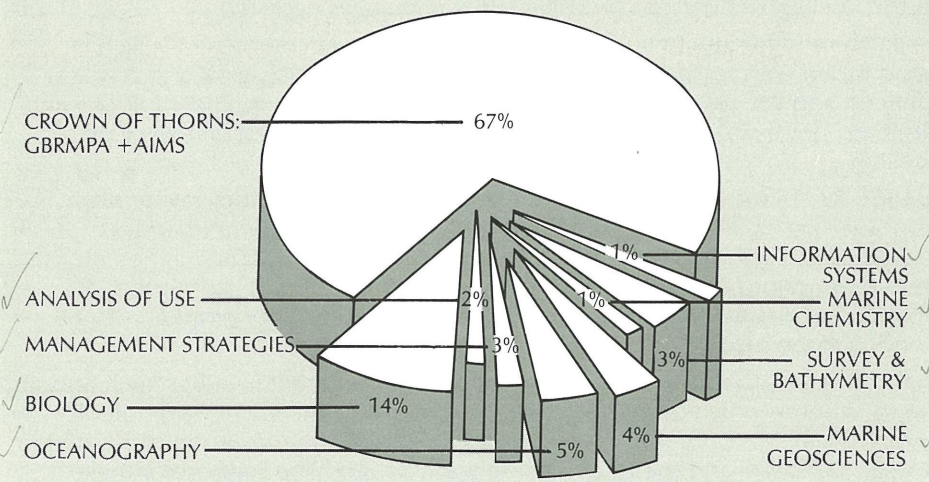


Figure 7
DISTRIBUTION OF FUNDS BY PROGRAM AREA
 (Total expenditure based on cash accounting: \$1 224 978)



Queensland National Parks and Wildlife Service (Q.NPWS), James Cook University of North Queensland (JCUNQ), the Australian Institute of Marine Science (AIMS), the Australian Fisheries Service, CSIRO, the Queensland Department of Primary Industries (Q.DPI) and AMSTAC. This role is assisted by the maintenance of a computer text database (with a published copy) that lists all marine research in the Great Barrier Reef Region. This is a subset of a national database that the Authority helped establish, 'Australian Marine Research in Progress' (AMRIP).

During 1986-87 the major objectives of the Section were to:

- continue the long term investigations of the crown of thorns starfish phenomenon
- pursue further the development of a Reef-wide monitoring program
- initiate a review of information regarding the impacts of trawling.

A Commonwealth grant of \$764 000 allowed the continuation of research into the crown of thorns starfish and this was a major part of the Section's work. The Authority employed a scientific officer to assist with the coordination of this research program.

To better meet its responsibility for monitoring the health of the Reef, the Section appointed a database manager to develop a program to collect, store and disseminate information that can be used for monitoring purposes.

Of the many projects undertaken during 1986-87 a number of the more topical are described below.

CROWN OF THORNS STARFISH

The coral-eating starfish phenomenon continued to be a major issue during the past year. Results from the AIMS surveys in 1985-86 of 228 reefs along the Great Barrier Reef indicated that damage was largely confined to the central third of the Reef. About 35% of 84 reefs surveyed between Lizard Island and Townsville were seriously affected and 30% were affected less seriously. Only about 6% of the reefs surveyed in the north and south showed signs of starfish damage. These surveys were undertaken by AIMS using funds allocated under the Commonwealth Community Employment Program. Outbreaks have continued to occur southwards from Townsville and the last outbreak reported was on Credlin Reef, north-east of Mackay.

The Authority undertook trial control exercises on Grub, John Brewer and Holbourne Island reefs using Army and Navy divers to determine how volunteers might be used to clear starfish. These control programs were expensive and of limited success; considerable logistic support was required, only small areas could be treated and starfish from adjacent areas migrated quickly to repopulate cleared areas. Different types of fences were tested to exclude starfish from cleared areas and one design was successful. A combined approach of clearing starfish using copper sulphate poison and erection of fences should allow the control of starfish in sections of reefs of importance to tourist operations or scientific research.

Any solutions to the problem of starfish outbreaks and the consequent damage to coral reefs lie in research. The Authority was awarded \$764 000 by the Commonwealth in 1986-87 in the second year of a proposed four-year coordinated study on the crown of thorns starfish. Fifty-eight projects were funded: 25 in the Management Research Program which is directed to causes, problems associated with, and control of starfish outbreaks; and 33 in the Ecology Program which is coordinated by AIMS. This program is directed towards understanding the biology and ecology of the starfish and corals that they eat.

The Crown of Thorns Starfish Advisory Review Committee, which advises the Authority on the conduct of the research program, met in May 1987 to consider the findings of the AIMS surveys and examine proposals for research in the coming year. The Authority organised a special session on the crown of thorns

starfish for the Australian and New Zealand Association for the Advancement of Science (ANZAAS) meeting in Townsville in August 1987 to allow the public and scientific community to discuss the results of research. The Authority continued to inform the public about the results of the research program with regular news releases, television interviews and talks. A 40-page booklet and a 28-minute videotape on the starfish were produced.

MONITORING OF THE CAPE TRIBULATION AREA

Work continued on four complementary projects that aim to determine and monitor the coastal biological and geological patterns and processes that operate in the vicinity of Cape Tribulation to assess the effects on the adjacent fringing reefs of sediment runoff from the new road. The biological studies are providing data on coral cover and patterns of recruitment at selected sites over time. Surveys of coral cover were to be undertaken before and after the wet season but, because of high water turbidity due to wind conditions, only surveys before the wet season have been possible.

Changes in sediment deposition are being investigated using sediment traps and by measuring suspended sediment at selected sites within catchments and in the nearshore zone. Hydrodynamic studies will provide information on sediment transport. Other geomorphological work is determining the sedimentary history of the reefs.

FRINGING REEF WORKSHOP

This workshop brought together scientists, tourist operators and park managers so that information on fringing reefs could be shared to stimulate interest in, and to emphasise the importance of these fringing reefs to tourism. There is lack of information about fringing reefs and some of the major management issues facing the Authority relate to their vulnerability to pollution, siltation and tourism.

The following recommendations were made at the workshop: that reef interpretive courses be arranged closer to tourist operators' businesses; that operators should consider the benefits of employing people trained in scientific aspects of the reefs to improve tourist awareness; and that there should be closer working relationships between resorts and research stations with resort operators assisting with monitoring and researchers helping with interpretation of research in progress. Topics ranked as high priority for research included identifying species to be used as indicators for baseline surveys, determining the limits of use that can be tolerated by fringing reefs and understanding more about patterns of use. There was also agreement that extensive monitoring of fringing reefs should be carried out to ensure their health is maintained.

SEAGRASS SURVEYS

The Authority has contributed to surveys being conducted by the Queensland Department of Primary Industries as part of a long term plan to map seagrass areas along the entire north-east coast of Queensland. Seagrass areas are important nursery grounds for many species of fish and prawns and are the major habitat of dugong. Accurate mapping of these areas will allow protection from adverse use and assist in the management of coastal resources. The

1986-87 part of the survey program aimed to locate and quantify the areas of seagrass between Bowen and Bundaberg. Initial results were used in the preparation of zoning plans for the southern sections of the Marine Park.

THE CORAL REEF SPAWNING EXPERIMENT (CORSEX)

This was a multidisciplinary program involving biological and oceanographic projects and was centred around the mass spawning of coral that occurred in late November 1986. The dispersion of coral spawn is important because it indicates the 'invisible' connections that exist between reefs, or sections of reef. Managers will be able to use this information to assist in determining the extent that effects may spread from activities at a reef. The biological study aimed to determine the distribution and survival rates of coral larvae as they were influenced by currents and weather after the mass spawning. The oceanographic study aimed to use this visible feature to test and improve models of water flow on and around reefs. These models can be used to predict circulation patterns, and assist in managing waste water disposal and tracking of oil spills.

DUGONG RESEARCH

Dugongs are important to the Aboriginal and Islander people in the Great Barrier Reef Region as a source of food and as an object of cultural significance. They are an endangered species world wide and the largest numbers of dugongs are now in Australian waters. Because of these facts, the Authority has funded two complementary projects to improve its understanding of the resource. One project aimed to describe the use of dugong by the Aboriginal communities at Hope Vale and Lockhart River in Far North Queensland and the second to investigate dugong biology and population levels. These projects are now completed and provide managers with an information base and recommendations from which to make decisions regarding the use and conservation of these animals.

REEFPLAN

REEFPLAN has been developed jointly by the Federal Department of Transport and the Authority and is a contingency plan to be used in the event of an oil spill in the Marine Park. The plan has now been published and defines the roles of the agencies that will be required to respond in the control, clean-up and monitoring of the effects of a spill. The Authority has the responsibility for coordination of the provision of scientific advice and media liaison. A working group has been established by the Authority to develop a scientific response strategy and regular liaison with the Federal and State authorities that will be involved in responding to a spill.

THE FUTURE

Investigations into the crown of thorns starfish phenomenon, development of a Reef-wide monitoring program and studies on the impact of trawling will continue to be priority research issues in 1987-88. Areas to be considered for increased research effort include the effects of waste discharge, in particular sewage, into Marine Park waters and the effects of fishing by recreational and commercial fishermen.



EDUCATION AND INFORMATION

In keeping with the Authority's goal and aims, the Education and Information Section provides advice, education and information materials and services to help the community better understand the provisions of the Marine Park and appreciate the Great Barrier Reef.

In the past year, the Section reviewed and restated its OBJECTIVES which are to:

- identify and assess the priority of needs for the provision of community education, information and advisory services about the Great Barrier Reef Marine Park and the Authority
- support the work of all Sections of the Authority through the provisions of design and publications assistance
- advise and cooperate with Queensland National Parks and Wildlife Service and other government agencies concerned with the Great Barrier Reef Marine Park to achieve the Authority's goal and aims
- facilitate and coordinate the provision of education and information services by the Authority
- evaluate the cost-effectiveness of achieving the Section's objectives and the Authority's goal and aims on a regular basis
- increase community awareness, understanding of, and support for, Authority policies, programs, and services
- encourage public appreciation of, and responsibility towards, the Great Barrier Reef Marine Park
- encourage and facilitate community cooperation and participation in the planning and management of the Great Barrier Reef Marine Park
- encourage and support community organisations, commercial or otherwise, in providing quality public education, information and interpretation services about the Great Barrier Reef Marine Park and the Authority.

Opposite: Just as seeing is believing, touching is revealing. Gasps of amazement are heard regularly at the touch tank where hands on experiences are the best way to learn.

HIGHLIGHTS OF 1986-87 PROGRAM

In the past year, the Section's objectives were achieved through the following activities.

Public Participation

Successful implementation of zoning and management plans requires the involvement and education of Reef users, and their lasting cooperation, since there is so much reliance placed on self-regulation. In conjunction with other Sections, Education staff were responsible for coordinating the publicity for the Authority's public participation program to develop a zoning plan for the southern sections of the Marine Park. Television and radio advertising; displays in shops, libraries, and councils; direct mailing; and public meetings were among the successful methods used in obtaining active public involvement with the zoning process.

Increased Publicity for the Marine Park

An important activity of the Section is to publicise special events undertaken by the Authority or that occur within the Marine Park. A greater emphasis was placed on obtaining media coverage for these events in 1986-87 and on distributing information to other organisations and individuals. Demand for Authority information materials is still increasing, particularly for film and video materials, photographs, displays, and articles about the Marine Park for newspapers and magazines.

Production of Educational and Information Materials

New audio-visual materials and further interpretive booklets, brochures and maps were produced to increase public awareness and understanding of the Reef and the Marine Park. A new video magazine *Reef Report* was successfully trialled amongst scientific, tourist, government and educational organisations. The costs of production and distribution are to be recovered from users. An audio-visual slide program *Encounters with the Reef* was produced as a kit for Australian secondary schools. In conjunction with the Research and Monitoring Section a 28-minute documentary video and a special feature in the journal *Australian Science Mag* were produced on the crown of thorns starfish. Both these productions will provide additional educational resources for Australian schools and universities. A further two issues of the newsletter *Reeflections* and one issue of *Ebb and Flow* were distributed to interested adults and young people. Four new *Reef Note* topics were added to this information brochure series: 'Captain Cook', 'Trochus Shells', 'Larval Fishes' and the Reef's 'World Heritage Site'.

Assistance to Community Organisations

The Section developed and trialled a new program of assistance to community organisations promoting educational materials or programs about the Reef. The Reef Education Development Program provided financial assistance to several organisations over a range of approved projects:

Australian Bird Study Association: to research and print a special edition of the journal *Corella* about seabirds of the Great Barrier Reef. (\$3150)

Woods Hole Oceanographic Institute, USA: to research and print a special colour Bicentennial edition of the international magazine *Oceanus*, dealing with the Great Barrier Reef. (\$2500)

ABC Television: to assist the production of a 30-minute documentary on managing the Reef for David Smith's *Earthwatch* program. (\$1900)

Jollification Pty Ltd Animated Films: in conjunction with Film Australia to assist final production of the animated cartoon *Neptune's Revenge* about not littering the Reef. (\$3000)

Fibres and Fabrics Association: to meet exhibition costs associated with reef-inspired fibre art display at Perc Tucker Gallery, Townsville. (\$1900)

North Queensland Visitors Bureau (now Magnetic North Tourism Authority): to contribute towards organisational expenses for a North Queensland tourism conference in which the Marine Park and Wonderland Aquarium were promoted. (\$1000)

Extension Services

With the planned introduction of the Central Section Zoning Plan and the formulation of a zoning plan for the southern sections, particular attention has been given to recreational and commercial fishermen. Direct contact was made with individual fishermen and with groups such as the Queensland Commercial Fishermen's Organization and Queensland Sport and Recreational Fishing Council to explain the Marine Park concept and disseminate information about zoning plans and regulations. The Authority contracted an ex-commercial fisherman over the period January to June 1987 to assist with this service.

Information Dissemination

Distribution and marketing of maps, publications, posters, audio-visual materials, brochures and activity leaflets increased markedly over the twelve months. A computerised contact data base was installed to improve mailing efficiency with newsletters and to reduce postal charges. Increasing demand by charter boat operators, resorts, schools and retail shops for Authority publications has demonstrated the increased popularity of these materials. Sale of publications was adopted in many instances as part of the Authority's cost recovery practices. Income from sales in this area more than doubled since 1985-86 and will be necessary to maintain supplies. Liaison with regional staff of Q.NPWS through working groups and project teams has also greatly assisted in the development and dissemination of education and information materials.

FREEDOM OF INFORMATION

The Authority did not receive any requests under the Freedom of Information Act (FOI) during 1986-87.

The Authority has fulfilled its statutory obligation under FOI by updating as required the documentation called for under sections 8 and 9 of the FOI Act, and by regular reporting. Responsibility for granting or denying access to documents rests with the Executive Officer for requests made to the Authority, and with the Secretary of the Great Barrier Reef Consultative Committee for requests made to that body. Responsibility for review of decision rests with the Chairman of the Authority and Committee respectively.

LIBRARY

The library provides an information service, based on published material, to assist the Authority and its staff in the execution of their duties. To fulfil this function the library acquires and controls a collection of material, provides a wide range of reference, bibliographic and current awareness services, and publishes a computer held bibliographic database. Cooperation with other libraries is actively pursued in order to make maximum use of resources.

The library collection includes monographs, periodicals, photographs, slides, films, pamphlets, posters, maps and charts. Although the emphasis is on the Great Barrier Reef, subject coverage is wide and includes collection strength in the areas of tourism and environment, environmental management, national parks and government administration. The library is heavily used and demand for services increases with each increase in Authority staff or addition to Authority activities.

The REEF database, which aims to index all published items about the Great Barrier Reef, is available throughout the country via Australian Consolidated Industries' public access system AUSINET. REEF helps to meet the reference needs of the Authority and its staff, and also assists in the dissemination of information to research workers and other interested members of the public. In 1986-87 over 500 new entries were added to the REEF database which now includes a total of 10 000 items.

There was a reduction in new items purchased for the library and in the number of subscriptions taken. This is a consequence of the reduced purchasing power of the Australian dollar and the reduction in the proportion of staff time available for selection and acquisition. Selected new acquisitions are now notified as holdings records to the Australian Bibliographic Network (ABN) in order to assist resource sharing.

Opposite: Many small display tanks provide visitors with a close look at reef animals with interesting behaviours or unusual characteristics. (Photographer: Ned Kelly)

Humbug fish
Orange-tailed damselfish
Puller fish



AQUARIUM

The Great Barrier Reef Aquarium which opened on 24 June 1987 exists to enhance community understanding, appreciation, experience of and support for the Great Barrier Reef, the Marine Park and the Authority by providing a readily accessible on-shore reef environment and interpretive facilities. It was developed as part of the Great Barrier Reef Wonderland Bicentennial Commemorative project which has these total objectives:

- to establish a national monument on the occasion of the Australian Bicentenary which will offer interpretive and educational services about the Great Barrier Reef for local, national and overseas visitors, and thus contribute to management of the Great Barrier Reef Marine Park
- to recognise and record in an enduring manner the roles of the Queensland and Commonwealth Governments in the conservation of the Great Barrier Reef, and its inscription on the World Heritage List
- to develop Great Barrier Reef Wonderland as a tourist attraction of international status, with an integration of outstanding facilities having wide appeal and involving Government and private sector funding.

The Aquarium features a coral reef system incorporating a walk-through viewing tunnel that provides a reef experience which is both fascinating and realistic, and stimulates the visitor to further explore the Great Barrier Reef.

Great Barrier Reef Wonderland also incorporates a branch of the Queensland Museum concentrating on the natural sciences, history, culture and development of North Queensland and features specialist exhibits relating to the Great Barrier Reef. Both these facilities were funded through Bicentennial grants.

An Omnimax cinema and commercial centre of shops, offices, food outlets and charter boat services were developed with private sector funding. High speed catamarans provide a service to the Great Barrier Reef.

LEAD UP TO OPENING

In September 1985 the Federal Government announced that it had approved additional funding for the Great Barrier Reef Marine Park Authority to enable it to operate the Aquarium as an educational facility about the Great Barrier Reef and

management of the Marine Park and to move its Townsville staff to the office building in the Wonderland complex. Construction of the Aquarium building was completed on schedule at the beginning of December 1986 by Kern Corporation, the company selected as developer for the project.

In December 1986 staff of the Aquarium commenced construction of the foundations of the reef structure in the Aquarium's main tank. This was completed by mid-January 1987 at which time both the reef tank and a large predator tank were filled with seawater. During February, communities of algae were established in shallow trays in the algal turf farm, which is the main water quality control system for both the reef and predator systems.

March saw the commencement of a 12-month program of stocking the reef tank with the hundreds of species of plants and animals found in a typical coral reef. At the same time the transport of sharks and other predators from an aquarium on Magnetic Island commenced with most predators having taken up residence in their new home by the end of April 1987.

The fitting-out of the 2000 square metres of public areas around the two main tanks was commenced in March 1987 by a Melbourne based firm, Acumen Communication Planning and Development Pty Ltd. The design of these areas includes 14 small aquariums containing dangerous or interesting reef animals and numerous interpretive and information displays about the size and age of the Great Barrier Reef, how it was formed, the types of reefs, corals and fish found on the Great Barrier Reef, early exploration, traditional hunting and fishing, present-day uses of the Reef and management by the GBRMPA and Queensland agencies. There is also a 150 seat auditorium showing an audio-visual which introduces the visitor to the various processes which form and maintain coral reef ecosystems and a touch tank which enables visitors to actually touch and feel those creatures which are found on a typical reef flat.

As the Bicentennial grant was not sufficient to fund the fitting-out of the interpretive areas, a fund-raising campaign was conducted by the Great Barrier Reef Wonderland Association Inc, the body established to oversight the Bicentennial elements of the project. Between September and December 1986 over \$1.4 million was pledged to the fund. The vast majority of pledges came from Local Government bodies, local business-houses and larger companies and corporations with branches in the Townsville region.

Great Barrier Reef Wonderland was officially opened by both the Prime Minister and the Premier of Queensland, before a crowd of 700 invited guests and national and international media. In his address Mr Hawke captured the essence of the coral reef aquarium concept: 'Imaginative planning and building, together with wonderful local support, have produced an amazing attraction that will both entertain and educate the public about our special piece of world heritage, the Great Barrier Reef. It is hoped that public understanding of the Reef will facilitate its management and ensure its preservation for future generations.'

THE FUTURE

Since the Aquarium opened there has been an average of 1200 visitors per day. Feedback indicates that the majority of visitors have thoroughly enjoyed their visit.

A number of new displays and exhibit improvements are already on the drawing board. These, together with the ongoing development of the reef and predator displays, will ensure that return visitors will always see something new and interesting.

The Authority is proud to have initiated this project and to have contributed to its development and operation.



Aquarium staff collect specimens to stock the coral reef tank.

ADMINISTRATION

The Administration Section is part of the corporate management and services program, the objective of which is to achieve cost-effective delivery of programs by providing executive management and administrative support and advice to the Minister, the Authority and its staff.

The Section's responsibility covers the following corporate services which are centralised in the interests of efficiency:

- personnel management
- finance management
- general services including property, word processing, stores, travel and registry.

The objective of the sub-program requires continual development of an appropriate infrastructure for operations.

The effectiveness of corporate services is assessed in relation to:

- the extent to which management information is timely and relevant
- responsiveness of service areas
- performance against financial and human resource plans
- staff skill levels, morale and input
- the cost of corporate services in relation to the Authority's budget.

Within the limits of Authority direction and regulation, the Section seeks to meet particular operating needs through informality and simplification of procedures and systems.

PERSONNEL MANAGEMENT

From a structure of 89 positions, 26 were advertised for filling within the approved staffing level (ASL) of 78. The major recruitment effort involved the progressive appointment of 16 staff to the Great Barrier Reef Aquarium in time for its opening on 24 June 1987. This was achieved despite the volume of applications for certain positions. For example, 138 applications were received for two positions of Aquarium Guide (Clerical Assistant, Grade 5).

In 1986-87 the average time between advertising and notification of promotion/appointment was 18 weeks for 26 positions advertised, compared with 18 weeks for 14 positions advertised in 1985-86. This is attributable to administrative requirements, the weight of applications and the necessity for the limited

number of appropriate officers to combine selection work with their mainstream responsibilities.

Suitable ex-staff are now available in Townsville and will be contracted as required to assist selection committees. In conjunction, government streamlining policies will facilitate the removal of administrative excesses which have contributed to the inordinate delays of the past.

The average staffing level for 1986-87 was 77.30. The variation of -0.9% from an ASL of 78 was mainly due to the unexpected loss of some inoperative staff.

Overall expenditure on salaries and related costs was \$2 268 000 which exceeded the estimate of \$2 258 000 by 0.4% due to additional compensation payments. Eight permanent staff (10.3%) left the Authority compared with ten (14.2%) in 1985-86. This greater stability was predicted but the incidence of extended leave plus the ability of staff to gain promotion elsewhere are expected to result in turnover remaining significant.

Figure 8
DISTRIBUTION OF STAFF BY
CLASSIFICATION AND SEX
30 JUNE 1987

	MALE	FEMALE	TOTAL
Below \$16076	1	5	6
\$16076 to \$18429 (to top of CA 4)	1	6	7
\$18430 to \$21083(to top of CLAD 2/3)	4	13	17
\$21084 to \$26367 (to top of CLAD 5)	4	6	10
\$26368 to \$34127 (to top of CLAD 8)	17	11	28
\$34128 to \$42910 (to top of CLAD 11)	16	1*	17
\$49389 and above (SES)	2	0	2
TOTAL	45	42	87

* Officer on Executive Development Scheme

In accordance with his powers under section 27 of the Public Service Act, the Chairman created the following positions during 1986-87:

Aquarium

- Assistant Executive Officer, Clerical Administrative (CLAD) Class 11
- Manager, Interpretive Centre, CLAD Class 9
- Administrative Manager, CLAD Class 8
- Community Relations Officer, CLAD Class 7
- Interpretive Officer, CLAD Class 7

Administrative Officer, CLAD Class 5
Curator, Science Class 4
Assistant Curator, Science Class 3
Biologist, Science Class 2
Senior Aquarist, Senior Technical Officer (Science) Grade 1
Aquarist, Technical Assistant Grade 2
Guides, Clerical Assistant (CA) Grade 5 (4 positions)

Research and Monitoring

Project Manager, CLAD Class 8

Park Management

Finance Officer, CLAD Class 7
Permits Assistant, CA Grade 4

Administration

Stores Supervisor

Education and Information

Education Officer, CLAD Class 7

Due to changes in work value the following positions were reclassified:

Planning

from Senior Project Manager (Planning), CLAD Class 9 to Park Management Officer, CLAD Class 8

Administration

from Staff Clerk, CLAD Class 2/3 to Class 4.

The following positions were abolished:

Administrative Officer, CLAD Class 10, Aquarium
Project Manager, CLAD Class 7, Planning
Purchasing Officer, CLAD Class 2/3, Administration

Figure 9 shows the distribution of staff by program.

Job design, selection criteria and other management practices have always reflected a policy of equal employment opportunity. The Authority's equal employment opportunity plan underwent further review during the year. Figure 8 shows the distribution of staff by salary level and sex.

The Public Service Reform Act requires the development of plans designed to achieve appropriate participation by officers and employees in certain decision making processes of an agency. During the year those concerned with the Authority's industrial democracy plan made suggestions for its improvement and these will be taken into account when the plan is revised.

In line with self-assessed and management initiated personal development requirements, the Authority selects from training opportunities offered by the Public Service Board, management consultants and other bodies. The needs in North Queensland are reflected in the increased training resources available. Authority management was instrumental in the establishment of a regional structure to assess and coordinate training of common interest to Commonwealth offices in the region.

Work related conferences and seminars also contribute to professional development. The Authority also enjoys a number of occasional presentations by

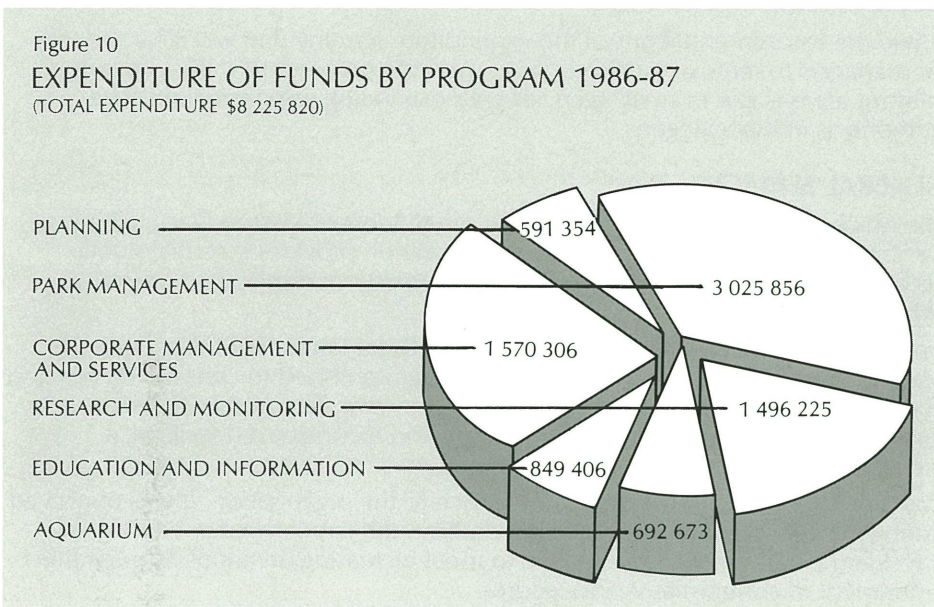
Figure 9
STAFF OF THE AUTHORITY
AT 30 JUNE 1987

(Full time Equivalent)

	PERMANENT	TEMPORARY	TOTAL
OPERATIVE			
Townsville: Executive	4.0	—	4.0
Research and Monitoring	4.8	2.0	6.8
Planning	10.0	—	10.0
Park Management	10.0	—	10.0
Education and Information	13.0	1.0	14.0
Administration	15.0	1.7	16.7
Aquarium	10.0	8.0	18.0
TOTAL TOWNSVILLE	66.8	12.7	79.5
Canberra: Executive	1.5	0.5	2.0
Support	2.0	0.8	2.8
TOTAL CANBERRA	3.5	1.3	4.8
TOTAL	70.3	14.0	84.3
JUNE 1986	61.4	8.8	70.2
INOPERATIVE			
Executive Development	1.0	—	1.0
Leave without pay - Study	2.0	—	2.0
- Public Interest	1.0	—	1.0
- Other	1.0	—	1.0
TOTAL	5.0	—	5.0

visiting and staff experts. During the year 30% of staff were involved on one or more personal development activities.

The continued health and safety of staff is paramount. Measures to prevent repetitive strain injury (RSI) continued and there were no new cases reported during the year. Eyesight testing for screen-based operators continued and staff who SCUBA dive in connection with their duties undergo annual medicals. Prohibitions on smoking in the office were introduced during the year and publicity is given to sporting and recreational activities which encourage healthy lifestyles.



FINANCE MANAGEMENT

In the 1986-87 budget, Parliament appropriated \$6 670 000 for the Authority's activities. Further funds of \$512 646 carried forward from 1985-86 were also available. Under the cost sharing arrangements for day-to-day management of the Marine Park, receipts from the Queensland Government were \$1 040 000. Receipts from other sources including the sale of information materials amounted to \$120 741.

Expenditure for the year was \$8 225 820, 98.6% of funds available. Full details are provided in Appendix F.

The expenditure of funds by program is shown in Figure 10. This figure reflects the allocation of salaries and certain overheads to each program.

Problems with the computerised financial management and accounting system continued during the year and it was unable to produce the suite of management reports intended. The need to extract information and prepare reports manually also affected the timeliness of management information.

Nonetheless, the ability of program managers and the efficacy of central measures enabled good control of expenditure without inhibiting program delivery. This outcome was reflected in the report of the Australian Audit Office which audits Authority operations in depth each year.

As well as the computer problems, finance staff faced extraordinary demands due to changes in the form of financial statements, establishment of the Great Barrier Reef Aquarium and other increases in Authority business. Transactions involving \$1 650 000 of Bicentennial and public donation funds were handled by the Authority on behalf of the Great Barrier Reef Wonderland Association. A deal of overtime was necessary.

While the recommendations of the expenditure scrutiny unit will clear the way for managers to remove inefficient processes, the prospect of staff savings in relevant areas is low in small agencies with expanding responsibilities. The Authority is in that category.

GENERAL SERVICES

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

In 1987-88 the office will be relocated to the Great Barrier Reef Wonderland complex. An accommodation committee was established to consider design and fit out options and met several times during the year. The Authority looks forward to occupying this permanent home and the improved facilities it provides.

Word processing is a most important service to the organisation. It was improved during the year by the acquisition of a dedicated microcomputer. The registry, travel and stores functions were able to meet increasing demands through the refinement of administrative procedures.

In the light of previous experience, arrangements for stocktaking were varied during the year by introducing biennial stocktakes of the library and general assets in alternate years. This system replaces annual stocktakes.

The cost of corporate (administrative) services in 1986-87 represents 11.9% of the Authority's total expenditure. This is not regarded as excessive but comparisons will need to be made with other agencies when program budgeting figures are provided across the Commonwealth.

APPENDIX A

AUTHORITY AND CONSULTATIVE COMMITTEE FUNCTIONS

The functions of the Authority, defined in section 7 of the Act as amended in November 1983 and June 1985, 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;
 - (cd) to provide, and arrange for the provision of, educational advisory and informational services relating to the Marine Park;
 - (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.’
- ‘(1A) For the purposes of this section but without limiting the generality of paragraph (1) (ca), (cb), or (cd), a matter shall be taken to relate to the Marine Park if it relates to:
- (a) the use or management of an area (which may be a Queensland national park or a Queensland marine park) the use or management of which would or might affect the Marine Park; or
 - (b) the use of a place outside the Marine Park for a purpose relating to the Marine Park.

Section 7 of the Act also confirms that the Authority is responsible for the management of the Marine Park:

(1B) The Authority is responsible for the management of the Marine Park.’

The functions of the Consultative 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.’

APPENDIX B

AUTHORITY SENIOR OFFICERS

Townsville Office:

Dr Don Kinsey (Executive Officer)

Richard Kenchington (Assistant Executive Officer, Planning)

Simon Woodley (Assistant Executive Officer, Park Management)

Dr Wendy Craik (Assistant Executive Officer, Research and Monitoring, July 1986 to February 1987)

Peter Ottesen (Acting Assistant Executive Officer, Research and Monitoring, from February 1987)

Ray Neale (Assistant Executive Officer, Education and Information)

Ian Burston (Acting Assistant Executive Officer, Aquarium)

David Chippendale (Assistant Executive Officer, Administration)

Canberra Office:

Peter Quilty (Acting Assistant Executive Officer)



A black-tip reef shark on its way to its new home at the Great Barrier Reef Aquarium.

APPENDIX C

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.

Research Report 1976-1982. Townsville, GBRMPA, 1983.

ISBN 0-642-52345-2.

Polyp. Geraldine Carlin. Townsville, GBRMPA, 1986.

ISBN 0-7244-8717-4.

TECHNICAL MEMORANDUM/REPORT SERIES

(ISSN 0817-6094)/(ISSN 0814-9224)

Research on Fishes of the Great Barrier Reef. Wendy Craik.

Townsville, GBRMPA, 1978. (Technical Memorandum GBRMPA-TM-1). 30p.

Fisheries Factors Affecting Marine Park Management. Wendy Craik.

Townsville, GBRMPA, 1978. (Technical Memorandum GBRMPA-TM-2). 30p.

GBRMPA-TM-3 not issued.

Amateur Fishing on the Great Barrier Reef. Wendy Craik. Townsville,

GBRMPA, 1979. (Technical Memorandum GBRMPA-TM-4). 19p.

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. Jason H. Middleton. Townsville, GBRMPA, August 1983.

(Technical Memorandum GBRMPA-TM-5). 42p.

Age Structure of the Fantome Island Fringing Reef. D P Johnson. Townsville,

GBRMPA, 1985. (Technical Memorandum GBRMPA-TM-6). 26p.

Reef Cover Zonation Classification System for Use with Remotely Sensed Great Barrier Reef Data. D Kuchler, Townsville, GBRMPA, 1986. (Technical

Memorandum GBRMPA-TM-7). 72p. ISBN 0-642-52513-7.

Geomorphological Nomenclature: Reef Cover and Zonation on the Great Barrier Reef. D Kuchler. Townsville, GBRMPA, 1986. (Technical Memorandum

GBRMPA-TM-8). 35p. ISBN 0-642-52521-8.

Reef Cover and Zonation Classification System for use with Remotely Sensed Great Barrier Reef Data: User Guide and Handbook. D Kuchler.

Townsville, GBRMPA, 1987. (Technical Memorandum GBRMPA-TM-9). 32p.

ISBN 0-642-52561-7.

Geomorphological Separability, Landsat MSS and Aerial Photographic Data: Heron Island, Great Barrier Reef. D Kuchler. Townsville, GBRMPA, 1987. (Technical Memorandum GBRMPA-TM-10). 12p. ISBN 0-642-52569-2.

An Atlas of the Skeletal Components of the Crown of Thorns Starfish. P D Walbran. Townsville, GBRMPA, 1987. (Technical Memorandum GBRMPA-TM-11). 42p. ISBN 0-642-52641-9.

Technical Memorandum GBRMPA-TM-12 in preparation.

Aquarium Fishes and their Collection in the Great Barrier Reef Region. Michael Whitehead et al. Townsville, GBRMPA, 1986. (Technical Memorandum GBRMPA-TM-13). 39p.

Management of Dugong: an Endangered Marine Species of Traditional Significance. C L Baldwin. Townsville, GBRMPA, 1985. (Technical Report GBRMPA-TR-1). 24p. ISBN 0-642-52441-6 [Reprinted 1987].

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. [Reprinted 1985].

Workshop on Coral Trout Assessment Techniques held at Heron Island 21 April-4 May, 1979. Townsville, GBRMPA, 1979. (GBRMPA Workshop Series No. 3) 85p. [Reprinted 1985].

Papers and Proceedings 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.

Workshop on Contaminants in Waters of the Great Barrier Reef: Proceedings of a Workshop held at Griffith University, Brisbane, Australia, 26 May 1984. I M Dutton (Ed). Townsville, GBRMPA, 1985. (GBRMPA Workshop Series No. 5) 43p. ISBN 0-642-52401-7.

Workshop on Response to Hazardous Chemical Spills in the Great Barrier Reef Region: Proceedings of a Workshop held in Townsville, 3 August 1984. G J S Craik (Ed). Townsville, GBRMPA, 1985. (GBRMPA Workshop Series No. 6) 107 p. ISBN 0-642-52409-2.

Workshop on the Offshore Effects of Cyclone Winifred. I M Dutton (Ed). Townsville, GBRMPA, 1986. (GBRMPA Workshop Series No. 7). 111p. ISBN 0-642-52529-3.

GBRMPA Workshop Series No. 8 in preparation.

Fringing Reef Workshop. Science, Industry and Management. C L Baldwin (Ed). Townsville, GBRMPA, 1987. (GBRMPA Workshop Series No. 9). 280p. ISBN 0-642-52633-8.

SPECIAL RESEARCH PUBLICATION SERIES (ISSN 0810-6983)

Fisheries of the Great Barrier Reef. Tor Hundloe. Townsville, GBRMPA, 1985. (GBRMPA Special Publication Series (2)). 158p. ISBN 0-642-52417-3.

Guide to the Identification of Seagrasses in the Great Barrier Reef Region. Janet Lanyon. Townsville, GBRMPA, 1986. [Cover title: Seagrasses of the Great Barrier Reef] (GBRMPA Special Publication Series (3)). 54p. ISBN 0-642-52489-0.

RESEARCH PUBLICATIONS

Green Island Economic Study. Economic Associates Australia. Townsville, GBRMPA, June 1983. 68p. ISBN 0-642-52337-1.

Data Review of Reef Related Tourism, 1946-1980. Australian Travel Industry Association (Queensland Board) Townsville, GBRMPA, June 1984. 120p. ISBN 0-642-52353-3.

Australian Marine Research in Progress: Great Barrier Reef Region, 1985-86. Townsville, GBRMPA, 1985-86. 211p. ISSN 0815-0087.

The Application and Potential of Remote Sensing in the Great Barrier Reef Region. David L B Jupp. Townsville, GBRMPA, 1986. 56p. ISBN 0-642-52449-1.

Economic Impacts of Activities on the Great Barrier Reef. S Driml. Townsville, GBRMPA, 1987. 86p. ISBN 0-642-52649-4.

A User-Based Evaluation of the Zoning Plan and Day-to-Day Management in the Capricornia Section of the Great Barrier Reef Marine Park.

Environment Science and Services. Townsville, GBRMPA, 1987. 53p. ISBN 0-642-52657-5.

Great Barrier Reef Tourism. A Review of Visitor Use. S M Driml. Townsville, GBRMPA, 1987. 50p. ISBN 0-642-52689-3.

ANNUAL REPORTS (ISSN 0155-8072)

Annual Report 1981-82

Annual Report 1982-83

Annual Report 1983-84

Annual Report 1984-85

Annual Report 1985-86

POSTERS

Turret Coral. 1984.

Clown Fish and Anemone. 1984.

Snorkelling at Heron Island Reef. 1985.

Reef Walking at North West Reef. 1986.

Gorgonia and Feather Star. 1986.

Aerial of Hardy Reef. 1986.

Capricornia Zoning Map. 1984.

Cairns Zoning Map. 1983.

Portraits of the Reef. [2 prints + notes] Robert Ingpen. Ruskin Press, October 1981.

Dugongs. Reef Heritage Series. 1984. Joint Series GBRMPA and Q.NPWS.

Coral Trout of the Great Barrier Reef. 1985.

ZONING PLAN PUBLICATIONS

Capricornia Section Zoning Plan. Townsville, GBRMPA, August 1980. 30p. + separate map. ISBN 0-642-90275-5.

Cairns Section Zoning Plan and the Cormorant Pass Section Zoning Plan. Townsville, GBRMPA, May 1983. 16p. + maps. ISBN 0-642-52329-0. [another edition, November 1983].

Far Northern Section Zoning Plan. Townsville, GBRMPA, August 1985. 42p. + maps. ISBN 0-642-52433-5.

Central Section Zoning Plan. Townsville, GBRMPA, 1987. 42p. ISBN 0-642-52553-6.

BROCHURES

An Introductory Guide to Life on the Great Barrier Reef. Photography by Len Zell and Bill Wood, GBRMPA, August 1981.

Introducing Capricornia: Capricornia Section, Great Barrier Reef Marine Park. Townsville, GBRMPA, May 1983.

Activities Guide: Capricornia Section, Great Barrier Reef Marine Park. Townsville, GBRMPA, May 1983.

Permits and Collecting: Capricornia Section, Great Barrier Reef Marine Park. Townsville, GBRMPA, May 1983.

Spearfishing: Capricornia Section, Great Barrier Reef Marine Park. Townsville, GBRMPA, June 1983.

Recreational Fishing: Capricornia Section, Great Barrier Reef Marine Park. Townsville, GBRMPA, June 1983.

Diving: Capricornia Section, Great Barrier Reef Marine Park. Townsville, GBRMPA, June 1983.

Boating: Capricornia Section, Great Barrier Reef Marine Park. Townsville, GBRMPA, June 1983.

Commercial Fishing: Capricornia Section, Great Barrier Reef Marine Park. Townsville, GBRMPA, June 1983.

Great Barrier Reef Marine Park: Cairns Section and Cormorant Pass Section: Introduction. Townsville, GBRMPA, November 1983.

Great Barrier Reef Marine Park: Cairns Section and Cormorant Pass Section: Activities Guide 1: Lizard Island Area. Townsville, GBRMPA, November 1983.

Great Barrier Reef Marine Park: Cairns Section: Activities Guide 2: Offshore Cooktown. Townsville, GBRMPA, November 1983.

Great Barrier Reef Marine Park: Cairns Section: Activities Guide 3: Offshore Port Douglas. Townsville, GBRMPA, November 1983.

Great Barrier Reef Marine Park: Cairns Section: Activities Guide 4: Offshore Cairns. Townsville, GBRMPA, November 1983.

Great Barrier Reef Marine Park: Cairns Section: Activities Guide 5: Offshore Innisfail. Townsville, GBRMPA, November 1983.

Great Barrier Reef Marine Park: Far Northern Section: Introduction. Townsville, GBRMPA, February 1986.

Great Barrier Reef Marine Park: Central Section Zoning Information:

Introduction. BRA Q128 and BRA Q129. Townsville, GBRMPA, June 1987.

Coral Reefs: a review of some audio-visual resources. Townsville, GBRMPA, December 1986 (3rd edition). 12p. ISBN 0-642-52481-5.

Coral reefs: a reading list with notes. Townsville, GBRMPA, June 1985 (2nd edition). ISBN 0-642-52473-4.

The Great Barrier Reef: fiction for children. Townsville, GBRMPA, February 1987. ISBN 0-642-52625-7.

SERIAL PUBLICATIONS

Reeflections. (ISSN 0314-6510)

Number 16, November 1985

Number 17, May 1986

Number 18, September 1986

Number 19, February 1987

Ebb and Flow. (ISSN 0729-0403)

Number 6, March 1985

Number 8, June 1987

Reef Notes. (ISSN 0814-9453). Joint Series GBRMPA and Q. NPWS

Crown of Thorns. February 1985

Reef Region Fisheries. February 1985

The Coral Polyp. February 1985

The Soft Touch – another View of Coral. February 1985

Coral Cays. July 1985

Fringing Reefs. July 1985

Turtles. July 1985

Seabirds. July 1985

The Great Barrier Reef. July 1986

The Annual Coral Spawning Event on the Great Barrier

Reef. July 1986

Whales. September 1986

Wrecks of the Reef. May 1987

World Heritage Site. June 1987

Larval Fishes. June 1987

Captain Cook. June 1987

Trochus Shells. June 1987

REEF Current Awareness Bulletin. (ISSN 0813-7897)

1985 Annual. Townsville, GBRMPA, 1987. 480p.

1986 Annual. Townsville, GBRMPA, 1987. 100p.

Reef Report. Video magazine.

Number 1, June 1987.

MAPS

The Great Barrier Reef Marine Park 1: 5 000 000. (A3 size, coloured)

September 1982 (BRA Q5)

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)

Cairns Section, Great Barrier Reef Marine Park Zoning Plans — Zoning Map (2) 1: 300 000. (A3 size, coloured) May 1983 (BRA Q51)

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 Q53)

Cairns Section, Great Barrier Reef Marine Park Zoning Plans — Zoning Map (5) 1: 300 000. (A3 size, coloured) May 1983 (BRA Q54)

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

MAPS — GREAT BARRIER REEF SERIES

Far Northern Section Zoning Plan Maps — Thursday Island 1: 250 000. (A1 size, coloured) August 1985 (BRA Q100)

Far Northern Section Zoning Plan Maps — Ashmore Reef 1: 250 000. (A1 size, coloured) August 1985 (BRA Q101)

Far Northern Section Zoning Plan Maps — Cockburn 1: 250 000. (A1 size, coloured) August 1985 (BRA Q102)

Far Northern Section Zoning Plan Maps — Weymouth Bay 1: 250 000. (A1 size, coloured) August 1985 (BRA Q103)

Far Northern Section Zoning Plan Maps — Tjouw Reef 1: 250 000. (A1 size, coloured) August 1985 (BRA Q104)

Far Northern Section Zoning Plan Maps — Princess Charlotte Bay 1: 250 000. (A1 size, coloured) August 1985 (BRA Q105)

Far Northern Section Zoning Plan Maps — Lizard Island 1: 250 000. (A1 size, coloured) August 1985 (BRA Q106)

Central Section Zoning Information: Guide for Users — Dunk Island 1: 250 000. (A1 size, coloured) 1987 (BRA Q109)

Central Section Zoning Information: Guide for Users — Hinchinbrook Island 1: 250 000. (A1 size, coloured) [1987] (BRA Q110)

Central Section Zoning Information: Guide for Users — Broadhurst Reef 1: 250 000. (A1 size, coloured) [1987] (BRA Q111)

Central Section Zoning Information: Guide for Users — Cleveland Bay 1: 250 000. (A1 size, coloured) [1987] (BRA Q112)

Central Section Zoning Information: Guide for Users — Hardy Reef 1: 250 000 (A1 size size, coloured) [1987] (BRA Q113)

Central Section Zoning Information: Guide for Users — White Tip Reef 1: 250 000. (A1 size, coloured) [1987] (BRA Q114)

Central Section Zoning Information: Guide for Users — Whitsunday Group 1: 250 000. (A1 size, coloured) [1987] (BRA Q115)

Central Section Zoning Information: Guide for Users — Hydrographers Passage 1: 250 000. (A1 size, coloured) [1987] (BRA Q116)

OTHER PUBLICATIONS

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 1985. Australian Institute of Marine Science; CSIRO Central Information, Library and Editorial Section; Great Barrier Reef Marine Park Authority and Victorian Institute of Marine Sciences. (CILES/CSIRO), 1985.

Plant Life of the Great Barrier Reef and Adjacent Shores. A B Cribb and J W Cribb. University of Queensland Press. St. Lucia, Queensland, 1985.

Poetry in Pictures: the Great Barrier Reef. Mark O'Connor and Neville Coleman. Hale & Iremonger, Sydney, 1985.

The Crown of Thorns Starfish. A special feature of *Australian Science Mag.* Leon Zann and Elaine Eager (Eds). Joint publication with Darling Downs Institute Press, Toowoomba, 1987.

AUDIO-VISUAL PRODUCTIONS

Encounters with the Reef: structure and evolution of the Great Barrier Reef. 50 slides and audio cassette. Townsville, GBRMPA, 1987.

The Crown of Thorns Story. Video, 25 minutes. Townsville, GBRMPA, 1987.

A Day on the Great Barrier Reef. Video, 8 minutes. Townsville, GBRMPA, 1987.

APPENDIX D

STAFF PAPERS PUBLISHED/PRESENTED IN 1986-87

(Asterisks* identify collaborators from other institutions.)

Baldwin Claudia. **User involvement in conservation of endangered species.** Endangered Species: social, scientific, economic and legal aspects in Australia and the South Pacific. Proceedings of a conference held at the University of Sydney, 1984 : 206-212. Total Environment Centre, 1986.

Claasen D van R and R Kenchington. **Managing coral reefs: operational benefits of remote sensing in marine park planning.** Proceedings of the 10th Canadian Symposium on Remote Sensing : 489-496. Edmonton, Alberta, Canada, 1987.

Claasen D van R (Editor). **The application of digital remote sensing techniques in coral reef, oceanographic and estuarine studies.** UNESCO Reports in Marine Science (42), 1986.

Claasen D van R and D L Jupp*. **Mapping shallow waters — the application of remote sensing techniques in coastal zone management: the Great Barrier Reef, Australia.** Paper presented to the regional seminar on the Application of Remote Sensing Techniques to Coastal Zone Management and Environmental Monitoring, Dhaka, Bangladesh, 18-26 November, 1986.

Claasen D van R and D A Kuchler*. **Planning the incorporation of remote sensing in marine projects** in D van R Claasen (Ed), 1986 : 3-13.

Claasen D van R, L D Zell, D L Jupp* and J Bolton*. **Preliminary mapping of benthic vegetation and water colour with satellite data** in D van R Claasen (Ed), 1986 : 58-63.

Craik W. **Monitoring in the Great Barrier Reef Marine Park.** Proceedings of Oceans '86 (vol 3 Monitoring Strategies Symposium : 785-790), Marine Technology Society, Washington DC.

Craik Wendy. **Research on marine mammals sponsored by the Great Barrier Reef Marine Park Authority.** Report of CSIRO Marine Mammal Workshop (CSIRO Division of Wildlife and Rangelands Research Technical Memorandum No 26) : 38-41, 1986.

Dutton I M. **Environmental management of the proposed floating hotel at John Brewer Reef.** Proceedings of the First Australasian Port, Harbour and Offshore Engineering Conference 1986. [also published in *Maritime Studies* (32) : 16-21, 1987.]

Dutton Ian. **The floating hotel at John Brewer Reef.** *Engineers Australia* 58 (21) : 35-38, 1986.

Harriott V J and D A Fisk*. **A comparison of settlement plate types for experiments on the recruitment of scleractinian corals.** *Marine Ecology Progress Series* 37 : 201-208, 1987.

Jokiel P L* and J L Morrissey. **Influence of size on primary production in the reef coral *Pocillopora damicornis* and the macroalga *Acanthophora spicifera*.** *Marine Biology* 91 : 15-25, 1986.

Kelleher G. **The Commonwealth's role in the environment: the Great Barrier Reef.** Educating for the Environment. Proceedings of a seminar and workshops 6-7 May 1985, Belconnen, ACT. Canberra, AGPS, 1986.

Kelleher G. **The Great Barrier Reef: a world heritage site.** Educating for the Environment. Proceedings of a seminar and workshops 6-7 May 1985, Belconnen, ACT. Canberra, AGPS, 1986.

Kelleher G. **Managing the Great Barrier Reef.** Educating for the Environment. Proceedings of a seminar and workshops 6-7 May 1985, Belconnen, ACT. Canberra, AGPS, 1986.

Kelleher G and B Jennison. **Implementing the National Conservation Strategy for Australia.** Paper presented to the Queensland Division of the Institution of Engineers (Australia), July 1986.

Kelleher G. **The environmental education of professional engineers.** Paper presented to the 3rd National Environmental Education Seminar, Canberra, February 1987.

Kelleher G, J C Day and B Jennison, **Aerial surveillance — the part it plays in managing the Great Barrier Reef.** Paper presented to the Standing Advisory Committee on Coastal Protection and Surveillance, Cairns, March 1987.

Kenchington Richard. **The Great Barrier Reef Marine Park.** Proceedings of the National Conference on Coastal Management. Coffs Harbour, 7-9 October, 1986.

Kenchington R A. **The workshop exercise: image analysis of John Brewer Reef, Great Barrier Reef, Australia** in D van R Claasen (Ed), 1986 : 104-108.

Kenchington R A and D van R Claasen. **A regional planning approach to marine resource management: the Great Barrier Reef Marine Park, Australia.** Proceedings of the International Marine Protected Areas Seminar, June 1-12, 1986. Sanctuary Program Division, NOAA/NOS, Washington DC, 1986.

Kinsey D W. **Status of the fringing reefs in the Cape Tribulation area.** Paper presented to the Heritage Commission — Commonwealth of Australia, Townsville, July 1986.

Kinsey D W. **The floating hotel project.** Paper presented to the Institution of Engineers, Australia, Townsville, August 1986.

Kinsey D W. **Responses of coral reefs to increased sedimentation and domestic sewage.** Paper presented to the Symposium on Marine Science in the Western Pacific, Townsville, 1-6 December 1986.

Kuchler D A*, D L Jupp*, D van R Claasen and W Bour* **Coral reef remote sensing applications.** *Geocarto International* 4 : 3-15, 1986.

Peterson M N and I M Dutton. **Planners at sea: planning the Great Barrier Reef Marine Park.** Paper presented to the 4th Annual Conference of the Local Government Town Planners Association, Townsville, July-August 1986.

Sambell Craig. **Zoning the reef.** *The Cruising Skipper* (20) : 60-64, 1987.

Sambell Craig. **Great Barrier Reef Marine Park.** *Cruising Helmsman* : 38-42, April 1987.

APPENDIX E

RESEARCH IN PROGRESS 1986-87

Detailed descriptions of projects are available on the database **Australian Marine Research in Progress** (AMRIP) on CSIRONET. A special printed edition for the Great Barrier Reef Region is published by the Authority each year.

- * Project completed during 1986-87
- + Augmentative Research Grant

ANALYSIS OF USE

The objectives of research in this field are to define resource utilisation of the Great Barrier Reef Region and to enable management to record the intensity, variability and periodicity of use of the Marine Park. The research includes collection of socio-economic data as well as evaluation of methods of investigation of usage.

186, 254 Traditional uses of marine resources by Aboriginal Communities on the east coast of Cape York Peninsula: Stages 1 and 2

PROJECT LEADER: Mr A Smith (Sir George Fisher Centre for Tropical Marine Studies, Departments of Marine Biology and Behavioural Sciences, James Cook University)

190 Application of Recreational Opportunity Spectrum to a Marine Park+

PROJECT LEADER: Ms K Means (Australian Environmental Studies, Griffith University)
SUPERVISORS: Dr T Hundloe, Dr R Rickson (Australian Environmental Studies, Griffith University)

199 *Troll fishery study

PROJECT LEADERS: Mr R Pearson, Dr G Goeden (Fisheries Research, Qld Department of Primary Industries)

255 Shell collecting in the Great Barrier Reef Region

PROJECT LEADER: Ms B Barnett (consultant)

256 *History of the Great Barrier Reef

PROJECT LEADER: Ms M Guilfoyle (History, James Cook University)

257 Traditional Fisheries Workshop

PROJECT LEADER: Dr L Zann (GBRMPA)

258 *Seaplanes at Green Island

PROJECT LEADER: Dr A L Brown (Australian Environmental Studies, Griffith University)

259 *A study of mobility and fishing strategies for the Queensland east coast prawn fishery+

PROJECT LEADER: Ms Y Beurteaux (Geography, James Cook University)
SUPERVISOR: Dr S Bandaranaike

260 The economic characteristics and significance of the Great Barrier Reef Region shell trade+

PROJECT LEADER: Miss K Herbert (Australian Environmental Studies, Griffith University)
SUPERVISORS: Dr T Hundloe, Mr J Ware

261 *The effect of noise on selected seabird populations on the Great Barrier Reef+

PROJECT LEADER: Mr R Mathers (Australian Environmental Studies, Griffith University)
SUPERVISORS: Dr A L Brown, Dr K Hulsman

283 A preliminary review of the effects of trawling in the Great Barrier Reef Region

PROJECT LEADERS: Dr I Poiner and Dr K Sainsbury (CSIRO Cleveland Marine Laboratory)

284 Attitudes of tourists to North Queensland with emphasis on the Great Barrier Reef

PROJECT LEADERS: Dr T Hundloe, Mr F Vanclay (Australian Environmental Studies, Griffith University)

304 Norman Reef amenity study

PROJECT LEADER: Dr P Pearce (Behavioural Sciences, James Cook University)

BIOLOGY

Biological research is undertaken to increase the understanding that we have of the ecosystems of the Great Barrier Reef Region and involves studies on many aspects of the reef environment. Work undertaken involves bird, dugong and turtle research as well as the obvious fields of fish and coral investigations. The Authority has a mandate to protect the health of the Reef and biological research is fundamental to this task. Much of the work is new and research has had to be carried out to determine methods of survey suitable for the task at hand and to assess the suitability of existing techniques.

64 *Biology and management of trochus

PROJECT LEADERS: Mr R Pearson, Mr W Nash (Fisheries Research, Qld Department of Primary Industries)

121 *An illustrated key to the parrotfishes of the Great Barrier Reef

PROJECT LEADER: Dr J H Choat (Marine Biology, James Cook University)

124 The effects of fuel oil, oil emulsifier, and lower salinity upon the common Indo-Pacific reef coral *Acropora formosa*

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

143 *An investigation into the relationship between breeding and feeding of seabirds around reef environments+

PROJECT LEADER: Mr G Smith (Australian Environmental Studies, Griffith University)
SUPERVISORS: Dr C Catterall, Dr K Hulsman

146,224 *Evaluation of biological and economic aspects of coral collecting in the Great Barrier Reef Region

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

163,225 Methods for the re-establishment of hard corals in denuded reef systems

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

165 Coral reef metabolism and calcification

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

166 *Provision of demographic data and recommendations for management guidelines for the collection of aquarium fish in the Great Barrier Reef Marine Park

PROJECT LEADER: Assoc Prof P Sale (Biological Sciences, University of Sydney)

177 Analysis of fish tagging data

PROJECT LEADER: Mr R Giddins (consultant)

181 *Detrital fluxes of Carbon and Nitrogen on a coral reef+

PROJECT LEADER: Mr R Johnstone (Biological Sciences, University of Sydney)
SUPERVISOR: Assoc Prof A Larkum

182 *Functional morphology and nutrition of the dugong in relation to its seagrass diet+

PROJECT LEADER: Ms J Lanyon (Zoology, James Cook and Monash Universities)
SUPERVISORS: Dr G C Sanson, Dr H Marsh

200 Demersal reef fish study

PROJECT LEADERS: Mr R Pearson, Dr G Goeden (Fisheries Research, Qld Department of Primary Industries)

201 Giant clam study

PROJECT LEADERS: Mr R Pearson (Fisheries Research, Qld Department of Primary Industries), Dr J Munro (James Cook University and International Centre for Living Aquatic Resource Management)

202 Red spot king prawn by-catch study

PROJECT LEADERS: Mr R Pearson, Mr M Dredge (Fisheries Research, Qld Department of Primary Industries)

204 Manta tow handbook

PROJECT LEADER: Mr G Bull (consultant), GBRMPA

211 *Pathology of crown of thorns starfish

PROJECT LEADERS: Dr D C Sutton, Dr J Lucas (Marine Biology, James Cook University)

212 *Recensus of reef fish at Sumilon Reef, Central Philippines

PROJECT LEADER: Dr G Russ (Zoology, University of Sydney)

213 The role of crustose coralline algae in coral reef ecosystems+

PROJECT LEADER: Mr J Chisholm (Botany, James Cook University)
SUPERVISORS: Dr I Price (Botany, James Cook University), Dr B Chalker (Australian Institute of Marine Science)

214 Analysis of mollusc benthic community structure in Capricornia Group coral reef lagoon sediments+

PROJECT LEADER: Mr B Long (Zoology, University of Queensland)
SUPERVISOR: Dr T Hailstone

215 Sexual and asexual reproduction: an electrophoretic examination of the brood planulae of scleractinian corals+

PROJECT LEADER: Ms J Resing (Zoology, Duke University, USA; Australian Institute of Marine Science)
SUPERVISORS: Dr S Wainwright (Duke University), Dr J Stoddart (Australian Institute of Marine Science)

- 216 Movements and behaviour of coral trout at Heron Island+**
PROJECT LEADER: Ms M Samoilys (Zoology, University of Queensland)
SUPERVISORS: Dr T Hailstone, Dr K Warburton (Zoology, University of Queensland)
- 237 Biological basis for managing populations of dugongs and other marine mammals in the Great Barrier Reef Marine Park**
PROJECT LEADER: Dr H Marsh (Zoology, James Cook University)
- 238 Monitoring and mapping of coral spawn slicks using remote sensing techniques (Pilot Study)**
PROJECT LEADERS: Dr J T Baker, Mr J Oliver, Ms B Willis (Biological Sciences, James Cook University), Dr D Kuchler (CSIRO)
- 239 *Central Section seagrass survey**
PROJECT LEADER: Dr R Coles (Qld Department of Primary Industries)
- 241 *Investigation of giant clam mortality – Lizard Island**
PROJECT LEADERS: Prof R S F Campbell, Dr J Glazebrook (Tropical Veterinary Science, James Cook University), Dr M W Shinwari
- 242 *Seagrass Guide**
PROJECT LEADER: Ms J Lanyon (Monash University)
- 243 *Survey of coral and coral trout in Capricorn and Capricornia Sections (including supplementary survey)**
PROJECT LEADERS: Drs A M and A L Ayling (Sea Research)
- 244 *6th International Congress of Parasitology Workshop, August 1986**
PROJECT LEADER: Dr R Lester (University of Queensland)
- 245 *Monitoring Swain Reefs**
PROJECT LEADER: Dr A M Ayling (Sea Research)
- 246 *Vegetation patterns of the southern inshore islands of the Great Barrier Reef+**
PROJECT LEADER: Mr P Brennan (Geography, University of Queensland)
SUPERVISORS: Dr G Hill (University of Queensland), Dr J Davie (Q.NPWS)
- 247 *A computer simulation of the effects of *Acanthaster planci* on coral community structure+**
PROJECT LEADER: Ms O Crimp (Australian Environmental Studies, Griffith University)
SUPERVISORS: Dr P Doherty, Dr R Braddock
- 248 Shearwater census and distribution for North West Island+**
PROJECT LEADER: Miss M Donohoe (Geography, University of Queensland)
SUPERVISOR: Dr G Hill
- 249 *Development and dispersal potential of coral larvae+**
PROJECT LEADER: Mr A Heyward (Marine Biology, James Cook University)
SUPERVISORS: Dr J D Collins, Assoc Prof M Pichon
- 250 The effect of potential pollutants on the growth of tropical hydroids+**
PROJECT LEADER: Mr R Ireland (Marine Biology, James Cook University)
SUPERVISORS: Dr C G Alexander, Dr G Denton
- 251 *Microbial degradation of petroleum products in coastal Great Barrier Reef waters+**
PROJECT LEADER: Miss R Larsen (Botany, James Cook University)
SUPERVISORS: Dr D C Sutton, Dr W Shipton, Dr J Luong-Van
- 252 *An examination of the feeding biology of gastropods that prey on scleractinian corals+**
PROJECT LEADER: Mr A Page (Zoology, University of Queensland)
SUPERVISOR: Dr R Willan
- 253 *Movement of *Strombus luhuanus* with particular reference to its ability to recolonise harvested areas+**
PROJECT LEADER: Mr M Ritchie (Australian Environmental Studies, Griffith University)
SUPERVISORS: Dr C Catterall, Ms J Boderio (Griffith University), Dr I Poiner (CSIRO)
- 290 Seagrass habitat survey – southern sections of the Marine Park**
PROJECT LEADER: Dr R Coles (Qld Department of Primary Industries)
- 291 Coral Spawning Experiment (CORSPLEX)**
PROJECT LEADER: Ms B Willis et al (James Cook University)
- 292 Reef survey of coral trout – report production**
PROJECT LEADER: Dr A M Ayling (Sea Research)
- 294 Population dynamics of green turtles**
PROJECT LEADER: Dr C Limpus (Q.NPWS)
- 295 Trawling impact – red spot prawn**
PROJECT LEADER: Mr M Dredge (Qld Department of Primary Industries)
- 296 Baseline survey – Hayman I and Hamilton I fringing reefs**
PROJECT LEADERS: Mr R van Woessik, Mr A Steven
- 297 *Proposal to map a major recruitment of *Tridacna gigas* juveniles at Lizard Island**
PROJECT LEADER: Dr R Braley
- 298 Coral Trout Workshop**
PROJECT LEADERS: GBRMPA, Q.NPWS
- 299 Norman Reef environmental study**
PROJECT LEADER: Dr A M Ayling (Sea Research)

305 Spawning, recruitment and juvenile ecology of coral reef fishes at Lizard Island, northern Great Barrier Reef+

PROJECT LEADER: Mr M Meekan (Australian Environmental Studies, Griffith University)
SUPERVISOR: Dr P J Doherty

306 Studies on the spatial and temporal abundance of fish larvae in the waters around Lizard Island, northern Great Barrier Reef+

PROJECT LEADER: Ms M Milicich (Australian Environmental Studies, Griffith University)
SUPERVISOR: Dr P J Doherty

307 The influence of algal cover on recruitment in reef fishes+

PROJECT LEADER: Mr K Clements (Marine Biology, James Cook University)
SUPERVISOR: Prof J H Choat

308 The population biology and ecology of fungiid corals in Alma Bay, Magnetic Island+

PROJECT LEADER: Mr R Paterson (Marine Biology, James Cook University)
SUPERVISOR: Dr J D Collins

309 Aspects of the growth and development of giant clams+

PROJECT LEADER: Mr C Shelley (Zoology, James Cook University)
SUPERVISORS: Assoc Prof J Lucas, Dr J Munro

310 A survey of the fish fauna of fringing 'high island' coral reefs in the southern sections of the Marine Park+

PROJECT LEADER: Mr A Steven (Marine Biology, James Cook University)
SUPERVISOR: Prof J H Choat

311 Identification and life history : features of juvenile baitfish in Cape Bowling Green fishing grounds+

PROJECT LEADER: Mr S Thorrold (Marine Biology, James Cook University)
SUPERVISOR: Prof J H Choat

313 Seasonal changes in the macro-algal vegetation and the associated mobile invertebrates on a fringing coral reef+

PROJECT LEADER: Ms V Vakamoce (Marine Biology, James Cook University)
SUPERVISORS: Dr I Price, Dr C G Alexander

315 A comparison of live and dead coral regions with regard to recolonisation of damaged reef areas+

PROJECT LEADER: Mr N Khandekar (Organic Chemistry, University of Melbourne)
SUPERVISOR: Dr R B Johns

316 Diseases in reef bivalves: particularly *Perkinsus* sp (Protozoa) in giant clams (*Tridacnidae*)+

PROJECT LEADER: Ms C L Goggin (Parasitology, University of Queensland)
SUPERVISORS: Dr R J Lester, Mr P Hunnam

318 Soil seed stores in islands of the Great Keppel Group+

PROJECT LEADERS: Mr S Underhill, Ms L Armstrong (Botany, University of Queensland)
SUPERVISORS: Dr D Lamb, Dr J Davie

319 The role of post-recruitment processes in affecting adult population size of the Humbug Damselfish at One Tree Reef+

PROJECT LEADER: Mr G Forrester (Zoology, University of Sydney)
SUPERVISOR: Assoc Prof P Sale

320 The demography of *Pomacentrus molluccensis* on the southern Great Barrier Reef+

PROJECT LEADER: Mr B Mapstone (Zoology, University of Sydney)
SUPERVISOR: Assoc Prof P Sale

ENVIRONMENTAL DESIGN

These studies are used to specify development strategies for the utilisation of the resources of the Marine Park that are compatible with the conservation of the Reef and its resources. Work to date has concentrated on offshore structures and developments.

266 *Checklist of the effects of offshore developments

PROJECT LEADER: Ms M Olson (Consultant)

INFORMATION SYSTEMS

These systems are used for the collection, storage and, most importantly the dissemination of information. Data includes reef-related physical and biological information, geographical data, information on research in progress as well as permits and representations data.

117 Australian Marine Research in Progress (AMRIP)

PROJECT LEADERS: Australian Institute of Marine Science, Great Barrier Reef Marine Park Authority, Victorian Institute of Marine Sciences, Information Resources Unit (CSIRO)

267 *Evaluation of Central Section public participation program

PROJECT LEADERS: Dr P Pearce, Ms G Moscardo, Mr G Ward (Behavioural Sciences, James Cook University)

268 Marine Research and Management Information System (MARAMIS)

PROJECT LEADER: Dr W Craik (GBRMPA)

301 6th International Coral Reef Symposium

PROJECT LEADER: Dr P J Davies (Chairman, Organising Committee)

MANAGEMENT STRATEGIES

The program aims to evaluate the effectiveness of current and alternate strategies for the management of the Marine Park consistent with conservation of the resources of the area. Studies include risk analysis of activities that occur in the park such as shipping as well as reviews of the zoning plans to determine whether objectives are being met.

217 *Reef walking capability assessment

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

218 *Shipping risk analysis

PROJECT LEADERS: Prof K Stark, Dr M K James (Civil and Systems Engineering, James Cook University), Mr T Janssen (Det Norske Veritas)

262 *Workshop on offshore effects of cyclone Winifred

PROJECT LEADER: Dr W Craik (GBRMPA)

263 The recreational usage of private boats in the Whitsunday Islands+

PROJECT LEADER: Ms W Goodburn (Geography, University of Sydney)

SUPERVISOR: Mr B O'Rourke

264 The Great Barrier Reef Marine Park: an appropriate management tool for the Australian Fishing Zone?+

PROJECT LEADER: Mr L Kriwoken (Centre for Environmental Studies, University of Tasmania)

SUPERVISORS: Dr P Hay, Dr B Davis

265 Planning study of the Capricornia Section, Great Barrier Reef Marine Park+

PROJECT LEADER: Ms D J Rosier (Regional and Town Planning, University of Queensland)

SUPERVISORS: Prof J Kozlowski, Dr G Hill

287 *Fringing Reefs Workshop

PROJECT LEADER: Ms C Baldwin (GBRMPA)

288 Fringing reef studies including fish study

PROJECT LEADERS: Mr S Domm (Q.NPWS), Mr R van Woesik, Mr A Steven

289 Review of research

PROJECT LEADER: Ms K Watson (Consultant)

133, 293 Monitoring Replenishment Areas: Stages 1 and 2

PROJECT LEADER: Mr K Beinssen (Q.NPWS)

312 Toward the development of a spatio – temporal atlas of the high island fringing reefs for the southern sections of the Marine Park+

PROJECT LEADER: Mr R van Woesik (James Cook University)

MARINE CHEMISTRY

Chemical analysis of the Great Barrier Reef environment is necessary to determine the background concentrations and distributions of possible contaminants of the environment. This allows the assessment of impacts of pollutants such as organochlorine pesticides.

160 Analysis of soils from coral islands in the Capricornia Section of the Great Barrier Reef Marine Park+

PROJECT LEADERS: Chemistry students (Capricornia Institute of Advanced Education)

SUPERVISORS: Dr G Pegg, Dr J Hughes

236 *Particulate matter as an indicator of terrigenous and anthropogenic inputs to corals of the Great Barrier Reef+

PROJECT LEADER: Mr B Currie (Organic Chemistry, University of Melbourne)

SUPERVISOR: Dr R B Johns

282 *Investigation of the presence of chlorinated hydrocarbon residues in Great Barrier Reef birds+

PROJECT LEADER: Mr N Waldron (Australian Environmental Studies, Griffith University)

SUPERVISOR: Dr D W Connell

300 Waste water disposal guidelines

PROJECT LEADERS: Dr P Bell, Dr P Greenfield (Griffith University), Dr D Connell (University of Queensland)

MARINE GEOSCIENCES

There is a need for understanding of the processes which formed the Great Barrier Reef so that contemporary development and degradation can be placed in perspective. The research includes analysis of sediments, growth rates of reefs and study of the processes of degradation of senile reefs.

151 Biologic reef destruction – products, rates and causes

PROJECT LEADERS: Dr P A Hutchings (Australian Museum), Dr P J Davies (Bureau of Mineral Resources), Mr W Kiene (Geology, Australian National University)

152 Coastal processes forming and maintaining the coral cays of the Great Barrier Reef and their implications for Marine Park management

PROJECT LEADER: Dr M Gourlay (Civil Engineering, University of Queensland)

153 Stratigraphy of lagoon sediments and reef margins – Lady Musgrave Island

PROJECT LEADER: Assoc Prof C V G Phipps (Geology and Geophysics, University of Sydney)

155 *Role of *Acanthaster planci* in reef degradational processes - a preliminary study

PROJECT LEADER: Assoc Prof R Henderson (Geology, James Cook University)

156 *Modern sediment dispersal at the Burdekin River mouth (Pilot Study)

PROJECT LEADERS: Prof R M Carter, Dr D Johnson and Ms A Way (Geology, James Cook University)

193 Sedimentary setting of fringing reef at Donovan Point

PROJECT LEADERS: Dr D Johnson, Prof R M Carter (Geology, James Cook University)

195 *Terrigenous sedimentation and change on Low Isles since 1929+

PROJECT LEADER: Ms C Rasmussen (Geography, James Cook University)

SUPERVISOR: Assoc Prof D Hopley

196 Past, present and future changes in the Cairns urban coastline+

PROJECT LEADER: Ms J Spriggs (Geography, James Cook University)

SUPERVISOR: Assoc Prof D Hopley

232 Coral recruitment on fringing reefs near Cape Tribulation

PROJECT LEADER: Mr D Fisk (Reef Research and Information Services)

233 Monitoring of Cape Tribulation fringing reefs

PROJECT LEADER: Dr A M Ayling (Sea Research)

234 Effects of disturbed rainforest catchments on adjacent fringing reefs - Cape Tribulation++

PROJECT LEADERS: Assoc Prof D Hopley, Mr D Hoyal and Mr B Partain (James Cook University)

235 Townsville's urban coastline - past, present and future changes+

PROJECT LEADER: Ms J Spriggs (Geography, James Cook University)

SUPERVISOR: Assoc Prof D Hopley

314 The burrowing activities of *Callianassa* sp: geological and ecological implications+

PROJECT LEADER: Mr P Walbran (Geology, James Cook University)

SUPERVISOR: Assoc Prof R A Henderson

OCEANOGRAPHY

Studies of wave patterns, tides and currents in the Region allow better understanding of the processes by which larvae and pollutants are dispersed throughout the Region. Modelling work will allow better prediction of dispersal and the inter-connectivity of reefs.

119 Circulation and sediment movement on and around North Queensland bayhead fringing reefs

PROJECT LEADERS: Assoc Prof D Hopley (Sir George Fisher Centre for Tropical Marine Studies, James Cook University), Mr K Parnell (University of Auckland)

150 Flow modelling in the central Great Barrier Reef Region - a collaborative research project

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

191b Installation of tide gauges: collaborative research

PROJECT LEADERS: Dr J C Andrews (Australian Institute of Marine Science), Dr L Bode (Civil and Systems Engineering, James Cook University), Mr T Savory (Bureau of Meteorology)

229 Establishment of remote weather stations on the Great Barrier Reef

PROJECT LEADER: Dr J C Andrews (Australian Institute of Marine Science)

230 Influence of coral reefs on wave attenuation and circulation

PROJECT LEADER: Dr I Young (RMC Duntroon)

231 Vertical and cross-shelf velocity structure of the tides of the central Great Barrier Reef+

PROJECT LEADER: Mr C Steinberg (Earth Sciences, Flinders University)

SUPERVISORS: Prof G W Lennon (Flinders University), Dr J C Andrews (Australian Institute of Marine Science)

302 Physical oceanography review

PROJECT LEADERS: Prof G Pickard, Dr J C Andrews (Australian Institute of Marine Science)

303 Coral spawning experiment (CORSPLEX)

PROJECT LEADER: Dr E Wolanski (Australian Institute of Marine Science)

317 A LANDSAT approach to modelling sediment movement to determine the extent of influence on the Whitsunday fringing reefs+

PROJECT LEADER: Mr A Hoffenberg (Geography, University of Queensland)

SUPERVISOR: Prof K Lyons

SURVEY AND BATHYMETRY

The objective of these projects is to provide detailed charts and maps of the Great Barrier Reef Region and to establish the ability of remote sensing to assist in classifying the area. Work has taken place using both aerial and satellite survey methods.

198 Spectrographic analysis of reef features

PROJECT LEADERS: Dr D Jupp (CSIRO, Division of Water and Land Resources), Dr D Kuchler (CSIRO, Davies Laboratories)

285 The Northeast Australian Satellite Imagery System (NASIS)

PROJECT LEADERS: JCU, AIMS, GBRMPA, CSIRO, Qld Department of Mapping and Surveying

286 *Australian Survey Office Reef Survey

PROJECT LEADER: Australian Survey Office

CROWN OF THORNS STARFISH

This is the program of research funded following recommendations of the Crown of Thorns Starfish Advisory Committee (COTSAC) in its report of January 1985.

210 Role of *Acanthaster planci* in reef degradational processes: historical perspective and current influence

PROJECT LEADER: Assoc Prof R Henderson (Geology, James Cook University)

269 *Survey of crown of thorns starfish in Capricorn and Capricornia Sections

PROJECT LEADERS: Drs A M and A L Ayling (Sea Research)

270 Survey of crown of thorns starfish predators on or in the vicinity of reefs of the Great Barrier Reef

PROJECT LEADERS: Assoc Prof R Endean, Dr A Cameron and Dr H McCallum (Zoology, University of Queensland)

271 The relationships between crown of thorns starfish outbreaks and water mass characteristics in the Great Barrier Reef

PROJECT LEADERS: Mr D van R Claasen, Dr L Zann (GBRMPA) and Ms E Coumbis (Consultant)

272 Potential human causes of *Acanthaster planci* aggregations in the South Pacific

PROJECT LEADERS: Dr L Zann (GBRMPA), Ms G Brodie (University of South Pacific, Fiji), Ms K Weaver and Mr G Andrews (Consultants)

273 Socio-economic consequences of major populations of crown of thorns starfish

PROJECT LEADER: Dr T Hundloe (Australian Environmental Studies, Griffith University)

274 Biological and economic risk analysis study to contribute to assessment of the need for control of crown of thorns starfish

PROJECT LEADERS: Dr T Hundloe, Dr J Parslow (Australian Environmental Studies, Griffith University)

275 Oral history of human use and experience of crown of thorns starfish on the Great Barrier Reef

PROJECT LEADERS: Dr A Chase, M Finnane, Ms R Ganter (Australian Environmental Studies, Griffith University)

276 Studies of diseases of the crown of thorns starfish

PROJECT LEADER: Prof R S F Campbell and Dr J Glazebrook (Tropical Veterinary Science, James Cook University)

277 Identification of bacterial populations associated with crown of thorns starfish and assessment of their role in the ecology of this starfish

PROJECT LEADER: Dr D C Sutton (Sir George Fisher Centre, James Cook University)

278, 333 Trial controls of crown of thorns starfish on the Great Barrier Reef

PROJECT LEADERS: Dr L Zann, Ms K Weaver (GBRMPA)

279 *A review of crown of thorns starfish control programs in Japan

PROJECT LEADER: Ms L Worland (Australian Environmental Studies, Griffith University)

280 Population dynamics of crown of thorns starfish on Suva Barrier Reef

PROJECT LEADERS: Mr J Brodie (University of the South Pacific, Fiji), Dr L Zann (GBRMPA)

281 Monitoring juvenile crown of thorns starfish on the Great Barrier Reef (pilot study)

PROJECT LEADER: Mr R Bell (Consultant)

321 Chemical pathways

PROJECT LEADER: Dr R B Johns (Organic Chemistry, University of Melbourne)

322 Mainland runoff hypothesis (land use)

PROJECT LEADERS: Assoc Prof D Hopley, Dr P Valentine, Ms C Rasmussen (Sir George Fisher Centre, James Cook University)

323 Artificial barriers for crown of thorns starfish management

PROJECT LEADER: Marine Bio-logic

324 Crown of thorns starfish sighting survey

PROJECT LEADERS: Dr L Zann, Mr B Miller Smith (GBRMPA), Marine Bio-logic

325 Crown of thorns starfish video

PROJECT LEADER: Dr L Zann (GBRMPA)

326 Crown of thorns starfish booklet

PROJECT LEADER: Dr L Zann (GBRMPA)

327 Use of near infra red photography for monitoring effects of *A. planci* outbreaks

PROJECT LEADER: Assoc Prof D Hopley (Sir George Fisher Centre, James Cook University)

328 Fish predator study – gut contents

PROJECT LEADERS: Prof J H Choat, Mr R Birdsey (Marine Biology, James Cook University), Mr P Matthew

329 Consequences of commercial fishing (analysis of catch)

PROJECT LEADERS: Prof J H Choat, Mr A Steven (Marine Biology, James Cook University)

330 Abundance and distribution patterns of *Acanthaster planci* on the Great Barrier Reef

PROJECT LEADER: Dr A M Ayling (Sea Research)

331 Information base and pilot study for an interdisciplinary study of Green Island

PROJECT LEADERS: Prof J H Choat, Mr I Baxter (Marine Biology, James Cook University)

332 Coral Spawning Experiment (CORSPLEX): relevance to crown of thorns starfish

PROJECT LEADER: Dr E Wolanski (Australian Institute of Marine Science)

APPENDIX F

FINANCIAL STATEMENTS

GREAT BARRIER REEF MARINE PARK AUTHORITY Financial Statements for the Year Ended 30 June 1987

In our opinion, the accompanying Statement of Activity, Statement of Assets and Liabilities, Statement of Capital Accumulation and Statement of Sources and Applications of Funds, have been prepared in accordance with the 'Guidelines for the Form and Standard of Financial Statements of Commonwealth Undertakings' approved by the Minister for Finance, as amended from time to time, and:

- (a) show fairly the operations of the Authority for the financial year ended 30 June 1987 and the financial position as at 30 June 1987; and
- (b) at the date of this certificate there are reasonable grounds to believe that the Authority will be able to pay its debts as and when they fall due.

GRAEME KELLEHER
Chairman
4 November 1987

DONALD W KINSEY
Executive Officer
4 November 1987

STATEMENT OF ACTIVITY for the year ended 30 June 1987
GENERAL OPERATIONS

	Note	1986-87 \$	1985-86 \$
REVENUE			
Parliamentary appropriations			
— Operational		5 300 000	4 884 000
— Capital		120 000	120 000
— Commonwealth contribution to day-to-day management	2(a)(b),8	1 250 000	1 380 000
		6 670 000	6 384 000
Payments from Queensland for day-to-day management	2(a)(c)	975 000	750 000
Interest		73 997	31 057
Miscellaneous revenue		63 004	36 150
Recovered assets	3	8 017	9 412
		7 790 018	7 210 619
Less			
Transfer to Great Barrier Reef Aquarium		653 787	—
Transfer to Capital Accumulation	4	592 534	538 318
Total operating revenue		6 543 697	6 672 301
EXPENSES			
Current expenses			
Expenses of the Authority	5(a)	63 260	65 458
Expenses of the Great Barrier Reef Consultative Committee	6	24 793	21 469
Executive and Secretariat		123 641	110 971
Salaries and allowances	5(b)	2 031 609	2 037 264
Research and Monitoring		1 334 781	1 252 570
Planning		248 725	227 523
Park Management		107 337	63 172
Payments to Queensland for day-to-day management	2	2 133 084	1 701 359
Education/Information		454 110	345 107
Administration		382 661	520 554
Great Barrier Reef Aquarium		—	120 579
Total operating expenses		6 904 001	6 466 026
Excess of current expenses over operating revenue	7	360 304	(206 275)
Profit on disposal of fixed assets		2 897	(27 755)
Provisions and other unfunded charges			
Depreciation of fixed assets		282 739	212 296
Long service leave		37 905	35 653
Annual leave		54 796	23 184
Leave fares		10 557	(538)
Unfunded liability transferred to Capital Accumulation		743 404	92 075

PROFIT AND LOSS STATEMENT for the year ended 30 June 1987
GREAT BARRIER REEF AQUARIUM

	Note	1986-87 \$
REVENUE		
Establishment funds transferred from General Operations		653 787
Admission fees		57 240
Other income		4 677
Recovered assets	3	13 332
		<u>729 036</u>
Shop sales		5 356
Cost of goods sold	8	3 337
Gross profit from shop trading		<u>2 019</u>
Less Transfer to Capital Accumulation	4	263 683
Total revenue & gross profit from shop trading		<u>467 372</u>
EXPENSES		
Current Expenses		
Salaries and allowances		91 059
Contract Services		
— aquarium operations		21 436
— plant operations and maintenance		25 506
— security		22 677
— cleaning		3 914
— ticket sales		2 448
— shop management		4 240
— other contracts		974
Electricity		74 259
Insurance		2 222
Marketing		61 282
Repairs and maintenance		
— plant and equipment		2 009
Requisites		521
Recruitment		28 668
Travel and subsistence		12 546
Rates		15 595
Sundry expenses		26 648
Depreciation of fixed assets	1(c)	38 063
Long service leave		16 535
Annual leave		10 563
Leave fares		1 562
Total expenses		<u>462 727</u>
Net result from commercial activities (Transferred to Statement of Capital Accumulation)		<u>4 645</u>

STATEMENT OF ASSETS AND LIABILITIES as at 30 June 1987

		General Operations	
	Note	1986-87 \$	1985-86 \$
ASSETS			
Current Assets			
Cash at bank		112 525	512 646
Cash on hand		—	—
Stock on hand		—	—
Advances and prepayments		20 126	25 905
Unexpended capital grants for day-to-day management	9	91 884	56 899
Debtors		80 650	15 507
Total Current Assets		305 185	610 957
Fixed Assets			
	14		
Furniture, Fittings & displays		78 625	86 265
Office machines		105 335	44 790
Audio visual & photographic		68 026	49 214
Marine & diving		263 864	80 224
Computer hardware		395 947	386 507
Computer software		245 390	168 544
Scientific and technical		106 863	99 725
Vehicles and mobile plant		108 392	100 213
Other plant and equipment		46 699	16 876
Construction work in progress		—	96 176
Aquarium contents		—	—
Improvements to leasehold property			
— Aquarium building		—	—
— Fixtures and Fittings		125 478	148 314
— Work in progress		350	—
Total Fixed Assets		1 544 969	1 276 848
Total Assets		1 850 154	1 887 805
LIABILITIES			
Current Liabilities			
Creditors		126 782	118 555
Accrued expenses		31 511	26 657
Provision for long service leave	1(g)	30 538	6 929
Provision for annual leave		260 702	237 864
Provision for leave fares		30 895	23 678
Total Current Liabilities		480 428	413 683
Non-Current Liabilities			
Provision for long service leave	1(g)	292 841	333 891
Total Non-Current Liabilities		292 841	333 891
Total Liabilities		773 269	747 574
SURPLUS OF ASSETS OVER LIABILITIES		1 076 885	1 140 231
Financed by ACCUMULATED CAPITAL (from Statement of Capital Accumulation)			

Great Barrier Reef Aquarium	Total	
1986-87 \$	1986-87 \$	1985-86 \$
3 229	115 754	512 646
1 813	1 813	—
50 894	50 894	—
44 548	64 674	25 905
—	91 884	56 899
303 552	384 202	15 507
<u>404 036</u>	<u>709 221</u>	<u>610 957</u>
207 925	286 550	86 265
7 730	113 065	44 790
217 232	285 258	49 214
4 800	268 664	80 224
7 924	403 871	386 507
—	245 390	168 544
14 790	121 653	99 725
—	108 392	100 213
488 401	535 100	16 876
—	—	96 176
277 577	277 577	—
7 238 833	7 238 833	—
—	125 478	148 314
50 537	50 887	—
<u>8 515 749</u>	<u>10 060 718</u>	<u>1 276 848</u>
<u>8 919 785</u>	<u>10 769 939</u>	<u>1 887 805</u>
327 792	454 574	118 555
15 370	46 881	26 657
—	30 538	6 929
42 521	303 223	237 864
4 902	35 797	23 678
<u>390 585</u>	<u>871 013</u>	<u>413 683</u>
71 880	364 721	333 891
<u>71 880</u>	<u>364 721</u>	<u>333 891</u>
462 465	1 235 734	747 574
<u>8 457 320</u>	<u>9 534 205</u>	<u>1 140 231</u>

STATEMENT OF CAPITAL ACCUMULATION for the year ended 30 June 1987

	Note	1986-87 \$	1985-86 \$
Balance from previous years		1 140 231	693 988
Funds used for capital works and services	4		
— General Operations		592 534	538 318
— Great Barrier Reef Aquarium		263 683	—
Bicentennial funds used for capital purposes		7 176 516	—
Donations used for capital purposes		1 100 000	—
Transfer of Unfunded Liability from Statement of Activity			
— General Operations		(743 404)	(92 075)
Transfer of Net Result from Profit and Loss Statement			
— Great Barrier Reef Aquarium		4 645	—
Accumulated Capital as at 30 June 1987		<u>9 534 205</u>	<u>1 140 231</u>
Net Assets from Statement of Assets and Liabilities		<u>9 534 205</u>	<u>1 140 231</u>

STATEMENT OF SOURCES AND APPLICATIONS OF FUNDS
for the year ended 30 June 1987

	Note	1986-87 \$	1985-86 \$
SOURCES OF FUNDS			
Funds from Operations	15		
General Operations:			
Inflow of funds from operations		6 535 680	6 662 889
Less outflow of funds from operations		6 904 001	6 466 026
		<u>(368 321)</u>	<u>196 863</u>
Great Barrier Reef Aquarium:			
Inflow of funds from operations		454 040	—
Less outflow of funds from operations		396 005	—
		<u>58 035</u>	<u>—</u>
Transferred from Revenue to Capital Accumulation			
General Operations		592 534	538 318
Great Barrier Reef Aquarium		263 683	—
		<u>856 217</u>	<u>538 318</u>
Reduction in Assets			
Current Assets			
Cash at bank		396 892	(267 044)
Fixed Assets			
Proceeds from sales of fixed assets		4 953	44 890
		<u>4 953</u>	<u>44 890</u>
Increase in Liabilities			
Current Liabilities			
Creditors		336 019	49 512
Accruals		20 224	—
		<u>356 243</u>	<u>49 512</u>
Total sources of funds		<u>1 304 019</u>	<u>562 539</u>
APPLICATIONS OF FUNDS			
Increase in Assets			
Current Assets			
Cash on hand		1 813	—
Stock on hand		50 894	—
Advances and prepayments		38 769	(13 385)
Unexpended grants day-to-day management		34 985	11 501
Debtors		368 695	(321)
		<u>495 156</u>	<u>(2 205)</u>
Fixed Assets			
Furniture, fittings & display equipment		3 270	22 914
Office machines		79 916	15 019
Audio-visual & photographic equipment		39 194	20 901
Marine and diving equipment		159 482	18 896
Computer equipment		122 003	204 073
Computer software		56 168	100 272
Scientific & technical equipment		26 275	57 393
Vehicles and mobile plant		35 751	14 236
Other plant and equipment		34 115	5 656
Aquarium contents		24 996	—
Construction work in progress		—	71 976
Improvements to leasehold property			
— Aquarium building		227 343	—
— Fixtures and fittings		—	31 309
— Work in progress		350	—
		<u>808 863</u>	<u>562 645</u>
Reduction in Liabilities			
Current Liabilities			
Accrued salary expenses		—	2 099
Total applications of funds		<u>1 304 019</u>	<u>562 539</u>

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 1987

1. ACCOUNTING POLICIES

The following accounting policies have been adopted in the preparation of the accounts.

(a) Accounts Format

The accounts of the Authority have been prepared in accordance with:

- the 'Guidelines for the Form and Standard of Financial Statements of Commonwealth Undertakings', as applicable to 'Other Undertakings', issued by the Department of Finance in February 1985; and
- accounting standards issued by Australian accounting bodies (where applicable).

(b) Historical Cost Convention

These accounts have been prepared on the basis of the historical cost convention and except where stated do not show the current cost of specific assets and the impact of such costs on operating results.

(c) Depreciation of Fixed Assets

Capitalisation occurs on all items which cost more than \$400. Fixed assets are depreciated by the straight line method over their estimated useful lives.

Great Barrier Reef Aquarium —

The Great Barrier Reef Aquarium building was funded as a Commonwealth-State Bicentennial project, through the Great Barrier Reef Wonderland Association Incorporated. The Aquarium is sub-leased by the Authority from the Association for a minimum period of 75 years. Under the terms of the sub-lease agreement the Authority is responsible for the replacement of the Aquarium building as necessary and for all expenses and revenue in relation to its operation. Consequently, the value of the Aquarium building has been taken up as an asset in the Authority's accounts and is being amortised over 25 years, which is the estimated useful life of the building.

Establishment costs associated with the Great Barrier Reef Aquarium were funded through the Great Barrier Reef Wonderland Association (from the Bicentennial grant and public donations) and the Authority (from appropriation and revenue). Such establishment costs have been capitalised and will be written off over an appropriate period.

The base stock of marine life, sand, coral and water in the Great Barrier Reef Aquarium has been included under fixed assets as a non-depreciable item. Additions to these stocks are added to the value of the base stock at cost. Future stock replacement costs will be treated as operating expenses.

The base stock of audio-visual displays at the Great Barrier Reef Aquarium has been included under fixed assets as a non-depreciable item. Additions to these stocks are added to the value of the base stock at cost. Future stock replacement costs will be treated as operating expenses.

(d) Advances to Consultants

Under the terms of certain contracts with consultants, payments are made in advance. Except for expenditure on assets which, under the terms of the contract become the property of the Authority from the date of acquisition, such advances are fully expensed in the year of payment. Where ownership of assets vests in the Authority on the completion of a contract, such assets are brought on charge by the Authority at that time, at their written down value and depreciated over their remaining useful life (refer Note 3 for details of recovered assets in 1986-87).

(e) Day-to-day Management Advances

Except for expenditure on those assets under the initial capital works program where ownership vests in the Authority, advances to the Queensland National Parks and Wildlife Service for day-to-day management are fully expensed in the year of payment (refer Note 2 for details of the day-to-day management item).

(f) Stock on Hand

Goods for resale have been valued at the lower of cost or net realisable value.

(g) Provision for Long Service Leave

Provision has been made for pro-rata entitlements of all staff who have at least five years eligible service at balance date.

The current liability represents the estimated value of long service leave that is proposed to be taken by staff during the succeeding year.

(h) Superannuation

As staff of the Authority are employed under the Public Service Act it has no obligation in respect of employer contributions to the Commonwealth Superannuation Scheme.

2. DAY-TO-DAY MANAGEMENT OF THE GREAT BARRIER REEF MARINE PARK

- (a) 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 (Q.NPWS) 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; assets purchased under this program, except for immovable assets situated on property owned by the Queensland Government, are owned by the Authority
 - other capital costs (ie, the post-initial program) of day-to-day management of the Great Barrier Reef Marine Park to be shared equally between the two Governments; assets purchased under this program are owned by Q.NPWS
 - the Commonwealth and Queensland to meet in equal shares the recurrent costs for day-to-day management in relation to the Great Barrier Reef Marine Park (which may include Queensland national parks or Queensland marine parks, the use or management of which would or might affect the Great Barrier Reef Marine Park)
 - expenditure on day-to-day management to be in accordance with an annually agreed program
 - the Authority to administer funds provided by the Commonwealth and Queensland for these purposes.
- (b) The Commonwealth appropriation for day-to-day management was based on:

	1987	1986
	\$	\$
(i) Recurrent and Post-Initial Capital Programs	1 040 000	1 076 000
(ii) Initial Capital Works	210 000	304 000
	1 250 000	1 380 000

- (c) The total Queensland contribution to day-to-day management was \$1 040 000. \$975 000 was paid to the Authority for disbursement in accordance with the Great Barrier Reef Marine Park Act 1975. Exigencies early in the financial year were met by a direct payment of \$65 000 from the Queensland Premier's Department to Q.NPWS. Note 7 refers to the actual Commonwealth contribution in 1986-87.
- (d) Financial statements for day-to-day management which have been prepared by Q.NPWS and audited by the Queensland Auditor-General are at Note 16.

3. RECOVERED ASSETS

Refer Note 1(d) for details of accounting policy on recovered assets.

The written down value of recovered assets brought on charge by the Authority during 1986-87 was \$8 017.

An adjustment has been made to capitalise some initial design costs for the interpretive facilities in the Great Barrier Reef Aquarium which were expensed in the 1985-86 year. These costs were \$13 332.

4. TRANSFER TO CAPITAL ACCUMULATION

The funds transferred direct from Revenue to the Capital Accumulation Account represent capital expenditure.

5. EMOLUMENTS PAID TO AUTHORITY MEMBERS

- (a) The item 'Expenses of the Authority' includes remuneration of \$7 201 paid to a part-time member in accordance with the Remuneration Tribunal Determination.
- (b) The item 'Salaries and allowances' includes remuneration totalling \$65 114 paid to the full-time Chairman of the Authority in accordance with the Remuneration Tribunal Determination.

6. EXPENSES OF GREAT BARRIER REEF CONSULTATIVE COMMITTEE

This item includes sitting fees totalling \$7 503 paid to part-time members in accordance with the Remuneration Tribunal Determination.

7. EXCESS OF CURRENT EXPENSES OVER OPERATING REVENUE

The \$360 304 excess of current expenses over operating revenue in 1986-87 was funded from \$512 646 cash at bank carried forward from 1985-86. \$368 800 was applied to day-to-day management (initial capital) bringing the Commonwealth contribution to day-to-day management to \$1 618 800.

8. COST OF GOODS SOLD

This item represents the cost of goods sold through the Great Barrier Reef Aquarium Shop as follows:

	1986-87
	\$
Opening Stock	—
Purchases	54 231
Closing Stock	50 894
	<u>3 337</u>

9. UNEXPECTED CAPITAL GRANTS FOR DAY-TO-DAY MANAGEMENT

This item represents unexpended initial capital works funds held by the Q.NPWS as at 30 June 1987. Note 2(a) refers to ownership of assets purchased under this program.

10. CAPITAL COMMITMENTS

In 1986-87 the Great Barrier Reef Aquarium entered into a contract for an additional air conditioning system at a cost of \$117 696. As at 30 June 1987, an amount of \$36 000 was owing under the contract and has been included in Aquarium creditors. The balance of the work under the contract (\$81 676) will be completed during 1987-88. Expenditure on this project is to be reimbursed from Bicentennial funds.

11. CONTINGENT LIABILITIES

The Authority is unaware of any contingent liability existing as at 30 June 1987.

12. RESOURCES PROVIDED FREE OF CHARGE TO THE AUTHORITY

The following resources were provided free of charge to the Authority and accordingly are not reflected as expenses in the Statement of Activity:

- (a) Commonwealth Work Experience Program - \$12 465. Staff employed by the Authority under this scheme are paid for by the Department of Employment and Industrial Relations.
- (b) Training For Aboriginals Program - \$2 102. Staff employed by the Authority under this scheme are paid for by the Department of Employment and Industrial Relations.
- (c) External audit services - \$31 000. The Auditor-General audits the accounts of the Authority without charge.
- (d) Coastal Surveillance - \$389 289. The share of these costs attributable to the Great Barrier Reef Region was met by the Department of Arts, Heritage and Environment. The Authority receives free of charge reports from aerial surveillance services within the Great Barrier Reef Region.
- (e) Source materials for many Great Barrier Reef Aquarium displays were made available at no cost to the Authority. It is considered impractical to assign a value to them.

13. LEASES

- (a) The aggregate amount of operating leases contracted for and outstanding as at 30 June 1987 is \$3 368 377. These leases are for a photocopier (\$831) and office accommodation (\$3 367 546). The discharge of these lease commitments will be:

	\$
Within one year	477 397
In the second year	346 318
Within a three to five year period	967 083
Later than five years	1 577 579
	<u>3 368 377</u>

- (b) The Authority sub-leases the Aquarium building from the Great Barrier Reef Wonderland Association Incorporated for a nominal amount payable if demanded.

14. FIXED ASSETS

Details of accumulated depreciation are:

	Fixed Assets at Cost	Accumulated Depreciation	Net Written Down Value
	\$	\$	\$
Furniture, fittings & displays	331 204	44 653	286 551
Office machines	164 553	51 489	113 064
Audio-visual & photographic	324 109	38 851	285 258
Marine & diving equipment	370 314	101 651	268 663
Computer hardware	644 232	240 360	403 872
Computer software	281 646	36 256	245 390
Scientific & technical	170 632	48 978	121 654
Vehicles & mobile plant	170 199	61 808	108 391
Other plant & equipment	549 382	14 282	535 100
Aquarium contents	277 577	—	277 577
Improvements to leasehold property			
— Aquarium building	7 267 215	28 382	7 238 833
— Fixtures & fittings	198 902	73 424	125 478
— Work in progress	50 887	—	50 887
	<u>10 800 852</u>	<u>740 134</u>	<u>10 060 718</u>

The detailed breakup of fixed assets between the Authority's General Operations and the Great Barrier Reef Aquarium is as follows:

	GENERAL OPERATIONS			
	Cost		Accumulated Depreciation	
	1986-87 \$	1985-86 \$	1986-87 \$	1985-86 \$
Furniture, fittings & displays	121 368	118 599	42 743	32 334
Office machines	156 206	79 279	50 871	34 489
Audiovisual & photographic	105 990	76 294	37 964	27 080
Marine & diving	365 189	155 435	101 325	75 211
Computer hardware	635 851	513 848	239 904	127 341
Computer software	281 645	179 482	36 255	10 938
Scientific & technical	154 153	126 520	47 290	26 795
Vehicles & mobile plant	170 199	133 873	61 807	33 660
Other plant & equipment	57 185	23 580	10 486	6 704
Construction work in progress	—	96 176	—	—
Aquarium contents	—	—	—	—
Improvements to leasehold property				
— Aquarium building	—	—	—	—
— Fixtures & fittings	198 902	198 902	73 424	50 588
— Work in Progress	350	—	—	—
	<u>2 247 038</u>	<u>1 701 988</u>	<u>702 069</u>	<u>425 140</u>

GENERAL OPERATIONS		GREAT BARRIER REEF AQUARIUM		
Written Down Value		Cost	Accumulated Depreciation	Written Down Value
1986-87	1985-86	1986-87	1986-87	1986-87
\$	\$	\$	\$	\$
78 625	86 265	209 835	1 910	207 925
105 335	44 790	8 348	618	7 730
68 026	49 214	218 119	887	217 232
263 864	80 224	5 125	325	4 800
395 947	386 507	8 380	456	7 924
245 390	168 544	—	—	—
106 863	99 725	16 478	1 688	14 790
108 392	100 213	—	—	—
46 699	16 876	492 197	3 796	488 401
—	96 176	—	—	—
—	—	277 577	—	277 577
—	—	7 267 215	28 382	7 238 833
125 478	148 314	—	—	—
350	—	50 537	—	50 537
<u>1 544 969</u>	<u>1 276 848</u>	<u>8 553 811</u>	<u>38 062</u>	<u>8 515 749</u>

15. RECONCILIATION OF NET FUNDS FROM OPERATIONS

Net Funds from operations is reconciled with amounts transferred from the Statement of Activity, General Operations and Profit and Loss Statement, Great Barrier Reef Aquarium to Capital Accumulation as follows:

	General Operations		Aquarium	
	1986-87	1985-86	1986-87	1985-86
	\$	\$	\$	\$
Net flow from Operations	(368 321)	196 863	58 035	—
Add — Income				
Recovered assets	8 017	9 412	13 332	—
Profit on disposal of fixed assets	2 897	(27 775)	—	—
	(357 407)	178 520	71 367	—
Less — Expenses				
Depreciation of fixed assets	282 739	212 296	38 063	—
Long service leave	37 905	35 653	16 534	—
Annual leave	54 796	23 184	10 563	—
Leave fares	10 557	(538)	1 562	—
	385 997	270 595	66 722	—
Transfer to Capital Accumulation	(743 404)	(92 075)	4 645	—

16.

NATIONAL PARKS AND WILDLIFE SERVICE
GREAT BARRIER REEF MARINE PARK
STATEMENT OF RECEIPTS AND PAYMENTS
FOR THE YEAR ENDED 30TH JUNE, 1987

1985-86		1986-87	
\$	\$	\$	\$
	The balance at 1st July comprised —		
73,279	Recurrent Costs	(48,287)	
137,694	Capital Works and Services	47,795	
12,300	Disposal of Motor Vehicles	—	
		<u> </u>	(492)
	Receipts for the year were —		
1,433,072	For Recurrent Costs	1,890,000	
352,893	For Capital Works and Services	768,800	
5,850	Disposal of Motor Vehicles	21,400	
	Transfer of funds to Capital Works and Services Balance from Recurrent Costs Balance	28,752	
	Reimbursement of Recurrent Expenditure over advanced to Department of Housing and Construction	5,551	
	Reimbursement of Capital Expenditure over advanced to Department of Housing & Construction	524	
1,791,815	Total Receipts (Note 1)	<u>2,715,027</u>	
	From which the following payments were made —		
825,852	Salaries, Wages, Superannuation and Payroll Tax	821,686	
728,786	Operating Costs (Note 2)	1,016,895	
442,792	Capital Works and Services (Note 3)	753,987	
18,150	To GBRMPA for vehicles sold	10,700	
	To Qld. Treasury Department for vehicles sold	10,700	
	Transfer of funds from Recurrent Cost Balance to Capital Works and Services Balance	28,752	
2,015,580	Total Payments	<u>2,642,720</u>	
* 223,765	Resulting in an excess of receipts over payments of		72,307
	Leaving a balance at 30th June comprising —		
(48,287)	Recurrent Costs	(20,069)	
47,795	Capital Works and Services	91,884	
		<u> </u>	<u>\$71,815</u>
\$ (492)			
* Excess payments			

NOTES TO AND FORMING PART OF THE ACCOUNTS

(A) Statement of Accounting Policies

(a) Basis of Accounts

The accounts have been prepared on a cash basis, consistent with the basis applied in the previous financial year.

(B) Statement of Significant Items Outside the Ambit of the Statement

1. Current Assets/Liabilities

Current assets and liabilities stood at a normal level at the beginning and end of the year.

2. Contingent Assets/Liabilities

There were no known contingent assets or liabilities of a significant nature at 30th June, 1987.

3. Statement of Capital Assets (At Cost) as at 30th June, 1987.

	Funded by Commonwealth (cumulative from 1st July, 1981)		Funded by Queensland (cumulative from 1st July, 1981)	
	1985-86 \$	1986-87 \$	1985-86 \$	1986-87 \$
Vessels and associated equipment	232,647	437,355	25,678	81,519
Vehicles *	116,576	162,244	17,997	39,097
Diving equipment	42,339	52,362	—	—
Audio-visual and interpretation equipment	76,635	114,332	6,716	8,526
Air compressor	5,646	5,646	2,150	2,150
Plant and equipment	110,885	318,162	17,799	28,330
Monitoring facilities	9,669	9,669	—	—
Accommodation, storage shed, and workshop - Heron Island	224,655	226,547	—	1,892
Interpretive building - Heron Island	166,324	168,088	—	—
Office accommodation - Cairns	116,893	116,893	—	—
Flinders Island - base equipment	29,025	43,257	—	—
Office accommodation - Innisfail	—	8,061	—	—
Quarantine Station - Townsville	—	95,650	—	—
	<u>1,131,294</u>	<u>1,758,266</u>	<u>70,340</u>	<u>161,514</u>

* The cumulative figures for Commonwealth funded vehicles in 1985-86 have been reduced by \$8,539. This represents the cost price of vehicles disposed of during that year.

* The cumulative figures for joint Commonwealth/State funded vehicles in 1986-87 have been reduced by \$13,651 each. This represents the cost price of vehicles disposed of during that year.

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

(C) Explanatory notes

	1985-86 \$	1986-87 \$
Note 1. Receipts during the year were provided from the following sources:		
Commonwealth Government:		
Recurrent Cost 50%	716,536	945,000
Capital Works and Services:		
Initial Program 100%	285,965	578,800
Post-Initial Program 50%	33,464	95,000
	<u>1,035,965</u>	<u>1,618,800</u>
Queensland Government:		
Recurrent Cost 50%	716,536	945,000
Capital Works and Services:		
Post-Initial Program 50%	33,464	95,000
	<u>750,000</u>	<u>1,040,000</u>
Reimbursement from Department of Housing and Construction for over advanced funds:		
Commonwealth funded - Capital	—	524
Commonwealth funded - Recurrent	—	2,775
State funded - Recurrent	—	2,776
	<u>—</u>	<u>6,075</u>
Disposal of Motor Vehicles:		
Funded 100% by Commonwealth	5,850	—
Funded 50% by Commonwealth	—	10,700
Funded 50% by State	—	10,700
Transfer of funds to Capital Works and Services Balance from Recurrent Costs Balance	—	28,752
Total receipts	<u>1,791,815</u>	<u>2,715,027</u>
	1985-86 \$	1986-87 \$

Note 2. Operating Costs

Air travel and fares	42,239	45,952
Travel allowance	54,643	71,612
Vessel charter	71,580	52,222
Air surveillance and charter	142,435	190,873
Vessel running expenses	37,935	67,915
Motor vehicle running expenses	36,397	33,749
Office supplies	16,722	13,173
Appointment expenses	—	7,881
Rates, services and rental	63,234	73,845
Photocopy and printing	3,824	23,760
Library	7,997	12,150
Conferences and training	1,397	3,195
General operating expenses	33,996	43,875
Photographic materials and processing	12,171	14,617
Furniture and fittings	24,807	15,493
Professional fees	5,383	20,654
Uniforms	1,670	222
Building maintenance	7,009	16,130
Day labour	68,761	133,467
Equipment maintenance and running	9,491	11,834
Communications expenses	36,304	56,938
Material and project requisites	50,791	107,338
	<u>728,786</u>	<u>1,016,895</u>

Note 3. Capital Works and Services

— Initial Program		
Vessels and associated equipment	91,467	148,868
Vehicles	13,247	33,108
Diving equipment	3,281	10,023
Audio-visual and interpretation equipment	14,351	35,887
Plant and equipment	26,995	196,746
Interpretive building - Heron Island	161,593	1,764
Office accommodation - Cairns	23,249	—
Flinders Island - base equipment	29,025	14,232
Office accommodation - Innisfail	—	8,061
Quarantine Station - Townsville	—	95,650
	<u>363,208</u>	<u>544,339</u>
— Post-Initial Program		
Vessels and associated equipment	32,703	111,681
Vehicles	18,269	69,502
Plant and equipment	28,612	24,681
Boatshed - Heron Island	—	3,784
	<u>79,584</u>	<u>209,648</u>
Total Capital Expenditure	<u>442,792</u>	<u>753,987</u>

CERTIFICATE OF THE QUEENSLAND NATIONAL PARKS AND WILDLIFE SERVICE

We have prepared the foregoing annual financial statement of the Queensland National Parks and Wildlife Service in relation to the Great Barrier Reef Marine Park as required by Part III Section (d) of a Basis of Agreement between the Commonwealth and Queensland Governments (1979) and certify as follows —

- (a) the foregoing financial statements and appended notes to and forming part thereof are in agreement with the accounts and records of the Service;
- (b) the receipt and expenditure of monies were in accordance with the approved programs and in accordance with draft agreements executed between the Commonwealth and Queensland Governments with regard to day-to-day management and control and ownership of assets; and
- (c) in our opinion —
 - (i) the prescribed requirements in respect of the establishment and keeping of accounts have been complied with in all material respects; and
 - (ii) the foregoing annual financial statements have been drawn up so as to present a true and fair view, on a basis consistent with that applied in the financial year last preceding, of the transactions of the Queensland National Parks and Wildlife Service in relation to the Great Barrier Reef Marine Park for the period 1st July, 1986 to 30th June, 1987 and of the financial position as at the close of that year.

J. G. Hows
Accountant
Queensland National Parks and
Wildlife Service

H. A. Bonney
Acting Director
Queensland National Parks and
Wildlife Service

CERTIFICATE OF THE AUDITOR-GENERAL OF QUEENSLAND

I have examined the accounts of the Queensland National Parks and Wildlife Service in relation to the Great Barrier Reef Marine Park as required by Part III Section (d) of a Basis of Agreement between the Commonwealth and Queensland Governments (1979) and certify as follows —

- (a) I have received all the information and explanations which I have required;
- (b) the foregoing Statement of Receipts and Payments and appended notes are in the form required by the prescribed requirements and are in agreement with those accounts; and
- (c) in my opinion —
 - (i) the prescribed requirements in respect of the establishment and keeping of the accounts have been complied with in all material respects; and
 - (ii) the foregoing statements have been drawn up so as to present a true and fair view, on a basis consistent with that applied in the financial year last preceding, of the transactions of the Queensland National Parks and Wildlife Service in relation to the Great Barrier Reef Marine Park for the period 1st July, 1986 to 30th June, 1987 and the financial position as at 30th June, 1987.

V. C. Doyle
Auditor-General of Queensland

APPENDIX G

AUDITOR-GENERAL'S REPORT

4 December 1987

The Honourable the Minister for
Arts, Sport, the Environment, Tourism and Territories
Parliament House
CANBERRA ACT 2600

Dear Minister

GREAT BARRIER REEF MARINE PARK AUTHORITY AUDIT 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 audit report its financial statements for the year ended 30 June 1987. These comprise a Statement of Activity, Statement of Assets and Liabilities, Statement of Capital Accumulation, Statement of Sources and Applications of Funds, accompanying notes to and forming part of the financial statements, and the certificate of the Chairman and the Executive Officer.

The financial statements have been prepared in accordance with the policies outlined in Note 1 to the statements and in accordance with the Guidelines for the Form and Standard of Financial Statements of Commonwealth Undertakings approved by the Minister for Finance. The statements are in the form approved by the Minister for Finance pursuant to sub-section 60(1) of the Act. A copy of the financial statements is enclosed for your information.

These statements have been audited in conformance with the Australian Audit Office Auditing Standards.

In accordance with sub-section 60(2) of the Act, 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 finalisation of formal agreement between the Commonwealth and Queensland governments for day-to-day management and control and ownership of assets, the receipt 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 sincerely



P. L. Lidbetter
First Assistant Auditor-General

