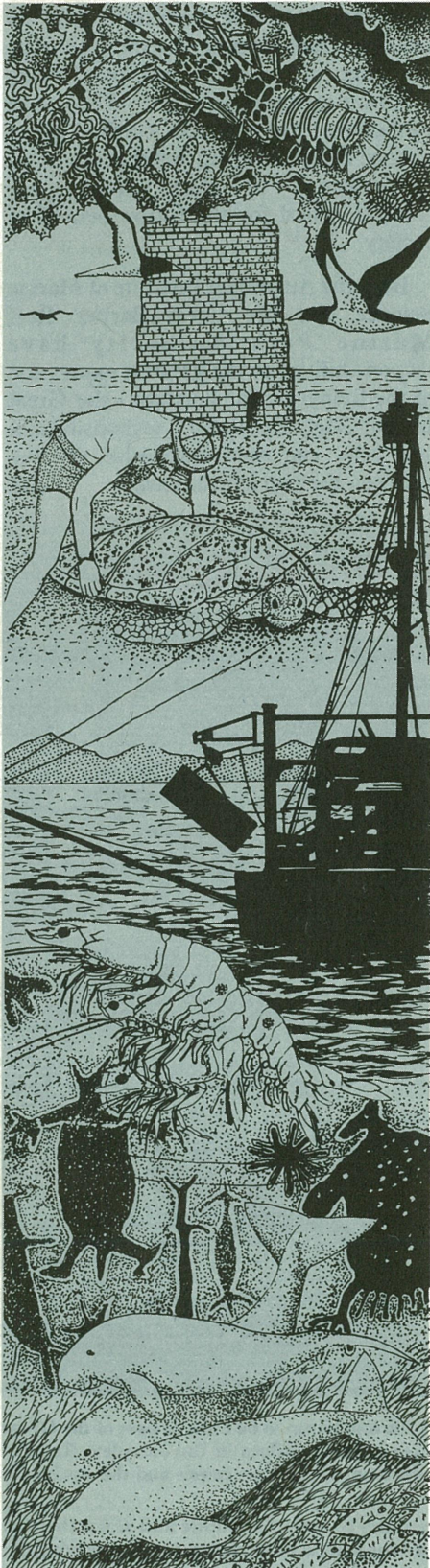


Reflections

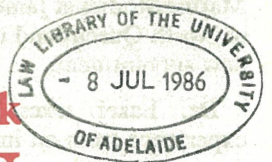
GREAT BARRIER REEF MARINE PARK AUTHORITY

May 1986

Free Issue No. 17



Great Barrier Reef Marine Park FAR NORTHERN SECTION ZONING PLAN



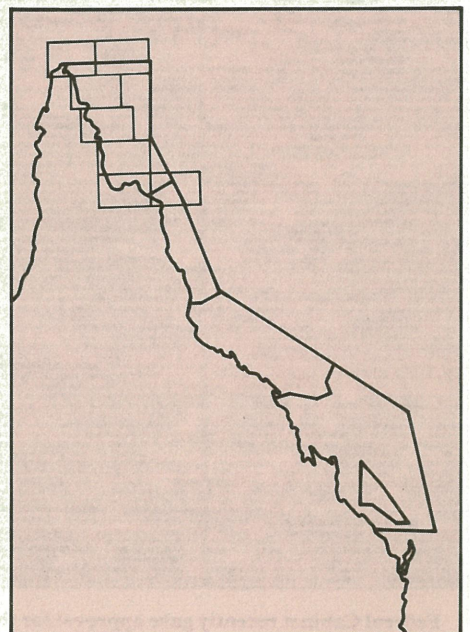
The Zoning Plan for the Far Northern Section of the Marine Park was presented to the Commonwealth Parliament by Mr Barry Cohen, Minister for Arts, Heritage and Environment on 12th September 1985. In tabling the plan, Mr Cohen said, 'The Zoning Plan I have just tabled provides the basis for managing human use and enjoyment of the park so that activities do not conflict with each other, and the natural qualities of the reef are conserved.'

'A draft Zoning Plan was prepared for this Section following a three-month period for the receipt of public representations. The draft Zoning Plan was then released for a further period of public review ending on 29 July 1984. The Plan was subsequently revised, where appropriate, taking account of the representations received. One hundred and seventy seven representations were made in relation to the draft Zoning Plan, many of them by organisations representing large numbers of people.'

'A new concept in zoning has been introduced in the Far Northern Section with the provision of designated shipping areas. These areas allow shipping to pass through zones where otherwise it would not be permitted, without compromising the conservation value of the zone. Another innovation in this plan is the provision for the protection from fishing activity of a wide band of reefs and waters stretching from the coast to the outer barrier. This cross-shelf transect will allow the study of variation between communities in various reef environments free from the complicating factors of latitudinal variation or the impact of fishing. I assure honourable members that the Zoning Plan also makes provision for extensive fishing grounds, within the

Section, and by the protection of nursery grounds for the continuing survival of the significant fishing industry in the area. The tabling of this Zoning Plan is but the first step in the establishment of management arrangements for the Far Northern Section. Regulations to give effect to the plan are being developed. The Plan will come into operation on a date to be specified by public notice.'

The Zoning Plan lay before Parliament for 15 sitting days and no motion was passed to disallow it. The Plan came into effect on 1st February, 1986.



A striking feature of the new Zoning Plan is the high quality maps. They are 1 : 250 000 scale and have been designed to complement existing maps produced by other mapping agencies.

New AIMS Director

Alan Dartnall
Australian Institute of Marine Science

Dr. J.T. Baker O.B.E. is the new Director of the Australian Institute of Marine Science. He took up his appointment on 11 November 1985. Dr. Baker has been a member of the Great Barrier Reef Marine Park Authority since 1976 and was Director of the Sir George Fisher Centre for Tropical Marine Studies at James Cook University of North Queensland until accepting this new appointment.

Dr. Baker takes to his new job experience from an impressive career in research, research management and consultancy. His services to marine science were recognised and honoured when he became an Officer of the Order of the British Empire in 1982.

The new director of AIMS is strongly committed to interaction and collaboration among the practitioners of marine science and to the extrapolation of the results of research for the benefit of society. He takes up the reins of an institution, which, whilst a young recruit to the national marine research centres of


the world, has established an international reputation during its first decade, particularly in mangrove research and coral reef ecology.

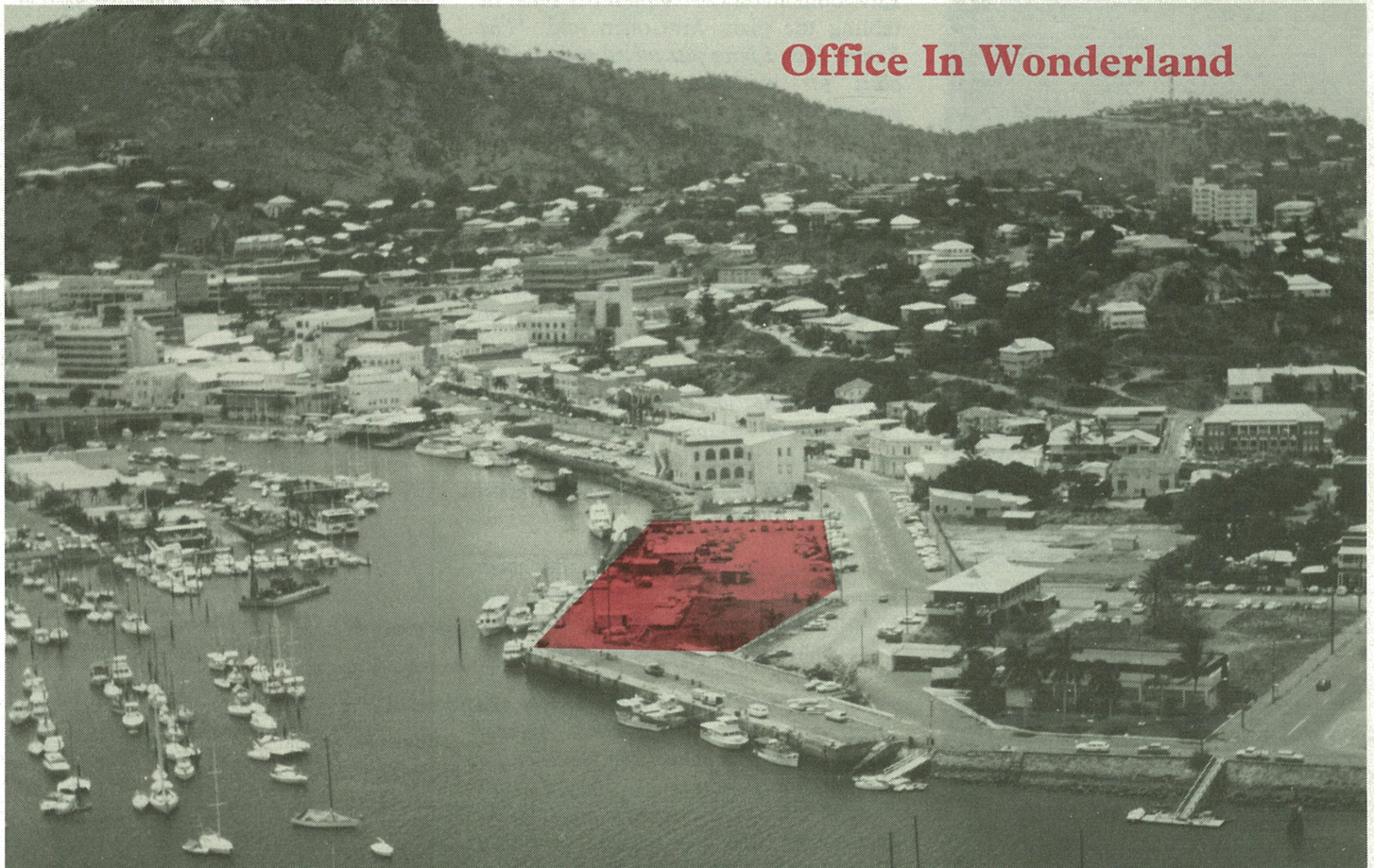
The Institute is acutely aware of the need for research into the Great Barrier Reef ecosystems. Dr. Baker will in his new post be encouraging the transfer of research results to facilitate the development of management practices and the political decision-making process.

It is now likely that some aspects of the Institute's research horizons will extend beyond the Great Barrier Reef to blue water and to the tropical Pacific, as well as other parts of tropical Australia. Recent research has shown that massive corals contain records of past weather conditions for as long as 1000 years. This work has global implications and there is an international responsibility to ensure that those implications are realised. The nations of ASEAN have recognised the importance of AIMS research techniques to the management of their mangrove resources. The Institute is actively ensuring the transfer of such important information to the ASEAN nations by conducting workshops and developing data base and communication systems

under the ASEAN-Australia Cooperative Program in Marine Science.

Dr. Baker has devoted much of his career to encouraging collaboration amongst the national and international science community. His own research on biologically active substances from marine organisms required extensive interactions. The functions of the Australian Institute of Marine Science are not only to carry out marine research but to cooperatively encourage, and facilitate marine science by other people or institutions. As the Institute enters its second decade its new Director faces the challenge of ensuring that the marine science community of Australia cooperates to produce further good science whilst ensuring that the important implications of that science are communicated for the future benefit of society.

Both the Australian Institute of Marine Science and the Great Barrier Reef Marine Park Authority have responsibilities to the greatest expression of the living marine heritage - the Great Barrier Reef. Dr. Baker's responsibilities and roles can only emphasize the ties between the two institutions. 



Office In Wonderland

Federal Cabinet recently gave approval for the Great Barrier Reef Marine Park Authority to operate the aquarium to be built as part of the Great Barrier Reef Wonderland complex on the banks of Ross Creek in Townsville. The Authority will also have its offices in the complex. Regular 'Reflections' readers know that this aquarium will offer exceptional opportunities to see coral reef communities and processes and the Authority intends to ensure the highest possible standards in its presentation.

The aquarium and its associated interpretive area will provide Authority staff with an ideal opportunity to meet the public and assist them in understanding and appreciating coral reefs. Only with this basis of understanding and appreciation can the public be expected to acknowledge the desirability of management of the Marine Park.

Recent Developments

REEF Database

What has 9,000 references but doesn't need to apply for a job? What is the quickest way to get a bibliography on any aspect of the Great Barrier Reef? To its many users, the immediate answer to these questions is the REEF database.

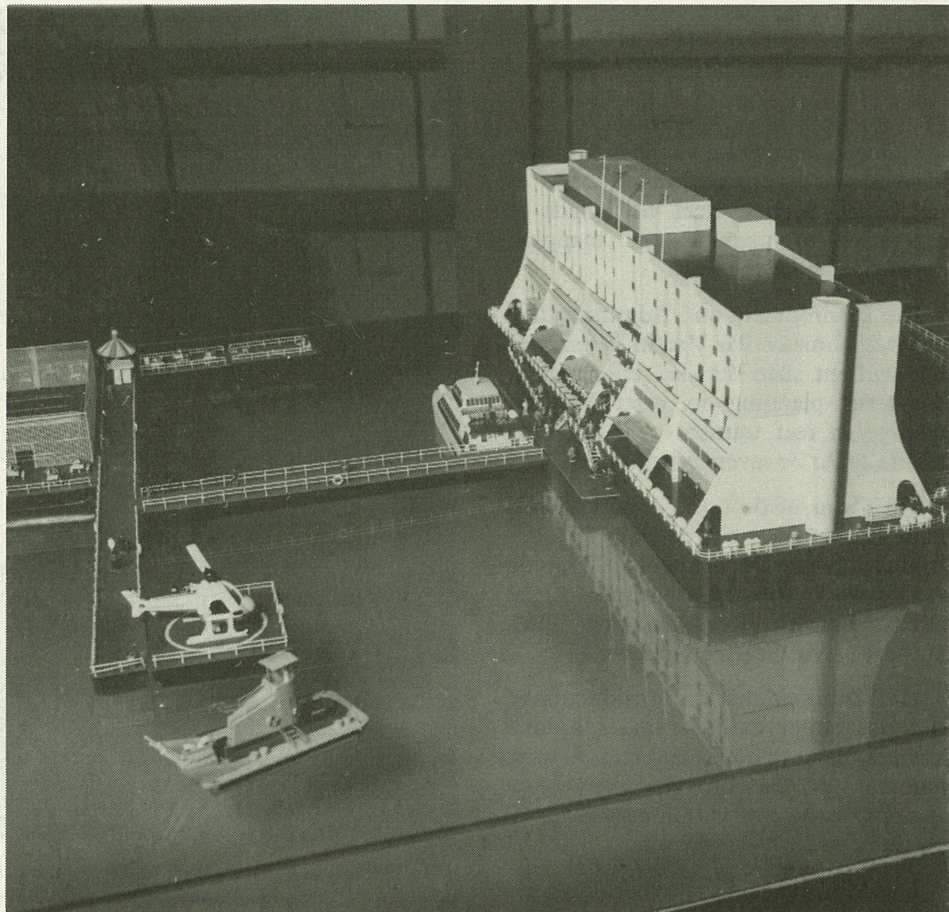
REEF is a computerised list of references to books, papers, magazine articles, maps, charts, films, and all sorts of published material about the Great Barrier Reef. It includes subjects as diverse as history and zoology, tourism and psychology and sources range from children's readers to technical journals.

REEF was started by GBRMPA with the help of CSIRO in 1980. Since then, references to newly published material have been added every month and used to produce a list - the 'REEF Current Awareness Bulletin.' This bulletin is distributed to coral reef enthusiasts not only in Queensland but also in other parts of Australia and throughout the world. It is now distributed by the International Society for Reef Studies to its members.

As well as the recently published material, older references have been added - our oldest is Captain Cook's journal. The aim is for REEF to be comprehensive and this ideal is being approached.

REEF is now entering a new era as one of the databases available on the AUSINET system. This will not change the existing services but will mean that if you have access to a computer terminal and if you or your institution are registered AUSINET users you can access REEF directly for your own searches. If you want to know more about this, your librarian will probably be able to help or you can contact the REEF editor at GBRMPA or ACI Computer Services Division in Brisbane or Melbourne.

A final plea from the REEF editor. If you are aware of a publication that you think should be in REEF and isn't, please let the editor know. Even database editors are human, make mistakes and enjoy feedback.



You may have seen press articles about a proposal to build a floating hotel at John Brewer Reef, within the Central Section of the Marine Park. Perhaps you thought what a marvellous holiday you could have there, or wondered about the possible costs, but did you pause to consider the problems involved in such a project?

DOWN TO THE SEA IN A HOTEL

GBRMPA has been discussing some of these problems with Reef Link Resorts Pty. Ltd., the firm which is planning to run the floating hotel. The Authority's overriding concern with this, as with other offshore developments, is to ensure they do not conflict with the principle of sustainable use. Environmental damage must be minimal and not threaten the long term survival of the Reef area. This is also in the interests of the resort managers who will naturally want to offer their guests the best possible Reef experience. Floating hotels have the potential to give many people a Reef experience without increasing the pressure on the islands of the Reef.

Safety is a matter of importance to everyone and is being attended to at all levels from the moorings that hold the hotel, to safety equipment and emergency power. The construction must be able to withstand the weather and sea conditions, which can sometimes be extreme in these latitudes. For this reason the building standards must be those recognised internationally as suitable for off-shore structures.

Pollution problems have been given considerable thought. No sewage or garbage is to be released onto the Reef. Fresh water will be provided by a desalination plant and the brine by-product from this must be carefully

disposed of in deep water. Fuel transport and transfer will have to be undertaken in ways that will prevent accidental spillage.

As well as these obvious sources of change, there is the possibility of more subtle influences. All the underwater parts of the structure will quickly become home water structures because no toxic paints, anti-fouling to sea creatures of one sort or another. This or other such chemicals are to be used.

It is possible that underwater noise may have an effect on some fish and the lights of the hotel at night may cause behaviour changes in birds or fishes. Shading, erosion or sedimentation may also change the local animal or plant communities. Such changes will not necessarily damage the Reef but need to be carefully monitored to ensure they do not exceed acceptable levels.

A resort management plan and operating standards are being developed prior to any work being carried out on John Brewer Reef. The plan will take into account not only the matters mentioned so far but a host of other details ranging from staff working conditions to an environmental education program for visitors. If all the problems are overcome, this should be a fascinating venture, neither ship nor building, clearly well afloat but definitely not all at sea!



Central Section Mapping

A Queensland State Cabinet Minister believes that improved tourist access to the Great Barrier Reef has made it imperative to upgrade our mapping knowledge about the reef.

The Environment and Administrative Services Minister, Mr Martin Tenni, said that without such detailed information, long-term planning to cater for the upsurge in reef tourism over the next decade could be severely hampered.

Mr Tenni made these remarks while handing over the latest batch of 53 maps produced by the Department of Mapping and Surveying to the Chairman of the Great Barrier Reef Marine Park Authority, Mr Graeme Kelleher.

Mr Tenni said that the introduction of fast passenger catamarans, seaplane services, floating hotels and reef-viewing "submarines" has brought many more sections of the reef within easy reach of tourists.

The Minister said that while emphasis had rightly been placed in recent years on upgrading navigational charts of the reef, a high priority was now needed on obtaining more detailed mapping information about the reef structures and coral cays for planning and management purposes.

The new maps, which cover 11 reefs, including John Brewer and the Slashers, 100 km north-east of Townsville, will be used for planning and management purposes by the Authority for the Central Section of the Great Barrier Reef Marine Park.

Mr Tenni said that the State Government's off-shore mapping programme had introduced new skills to Queensland's traditional land based mapping industry.

'The advent of modern mapping technology, such as satellite position fixing equipment and automatic logging equipment to record depth sounding, has allowed Queensland's map makers to tackle this large and expensive project efficiently,' he said.

The Townsville reef mapping project was started in November 1981 and has involved the mapping of some 25 reefs.

It complements the production of 1:250,000 scale maps covering the whole GBR Region. These maps use Satellite imagery produced by the Australian Survey Office. This technology was developed by the CSIRO on contract to the Authority.



On Friday, 22 November, 1985, Queensland Premier and Treasurer, Sir Joh Bjelke-Petersen, turned the first sod to commence construction of the \$20 million Great Barrier Reef Wonderland in Townsville.

'This project will bring the magnificent attractions of the Reef closer to the people,' the Premier said.

'The facility will significantly boost tourism in Townsville and the north'.

The Premier said the Wonderland complex was an Australian Bicentenary project and as such had been allocated \$3.5 million in funding by the Queensland Government to match a similar Commonwealth grant.

'The employment opportunities Wonderland will create both during construction and after its completion make it one of the State's outstanding projects,' the Premier said.

'Its substantial benefits to the economy and the incentives it will give to many small businesses in Townsville have been carefully assessed and will repay the investment involved.'

The Premier said the Great Barrier Reef Wonderland figures prominently on the impressive list of multi-million dollar tourist construction and developmental projects at key locations throughout the state.

The Authority was represented at the ceremony by its Chairman, Mr Graeme Kelleher, who originated the project in 1980.

Marine Mammal Identification

There are few more exhilarating experiences than to be in a boat at sea surrounded by leaping dolphins or to observe the sounding of a stately whale. After the first excitement, most people ask, what sort was it? To help answer this question, the Zoology Department of James Cook University has produced a double sided poster

which is a key to marine mammals of the Great Barrier Reef.

Scientific advisers for the key were Dr. Helene Marsh and Dr. Peter Arnold and the artwork was done by Geoff Kelly. The segment reproduced here shows only one of the nineteen species illustrated. Copies of the poster may be obtained free from the Great Barrier Reef Marine Park Authority or from the Zoology Department, James Cook University.



* **HUMPBACK WHALE** *Megaptera novaeangliae*

Close Encounters

in Great Barrier Reef Waters

A project is currently underway in the Systems Engineering Department of James Cook University to determine the risks associated with shipping using the inner route of the Great Barrier Reef. (The inner route runs from Torres Strait in the north to Capricorn Channel in the south and is between the Queensland coast and the outer reef.)

The shipping channels south of Cairns are in relatively open waters, but north of Cairns the inner route is confined by reefs and islands lying, in many cases, within a nautical mile of the shipping channels.

Any shipping traffic creates the potential for an accident which could lead to an environmentally hazardous material polluting the sea. The aim of this project is to determine which areas pose most risk to shipping, and thus, which areas are most threatened by that traffic.

The project is being developed in two parts. The first part is a computer simulation of navigation processes in these waters. It includes such elements as shipping patterns, navigation aids, and the meteorological conditions of the area. The simulation of the navigation process also takes into account the navigators' tasks of fixing position and recognising turning points and obstacles. Small errors inherent in these tasks, for example in the accuracy of reading a compass, result in uncertainty about the ship's position and the closeness of obstacles. In good weather conditions, these errors pose little threat to navigation, but in times of poor visibility, the inaccuracies have more significance. Mechanical and electrical failures on board ships will also be included in the simulation as will human errors in misinterpreting information (mistaking a land mark etc.). By combining all these factors, the model will predict the likely geographical distribution of encounters and their characteristics (visibility, ship speed, ship type, etc.). An encounter can be described as any situation which may be potentially dangerous to the ship, the threat coming from either a reef or another vessel.

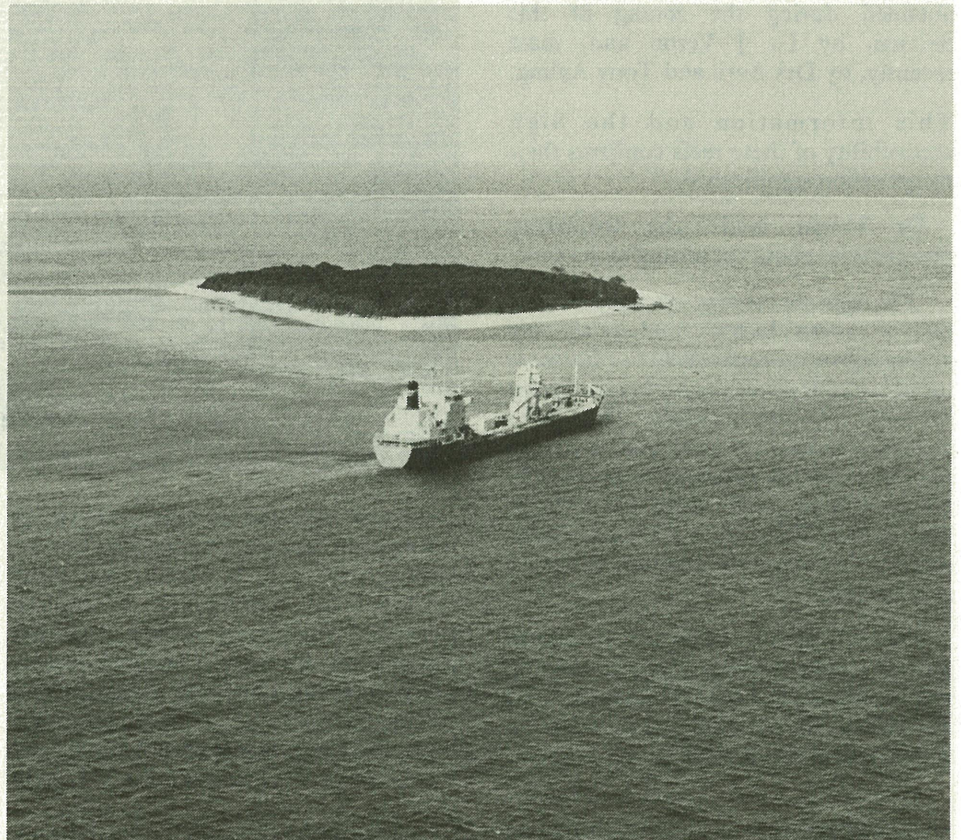
The second part of the project concerns the result of encounters, that is, whether

the encounter leads to a collision or grounding. This involves modelling the navigator's decision processes in taking any avoiding action and also incorporates influences from the prevailing meteorological conditions.

Results from this study will include a prediction of the geographical distribution of accidents, highlighting the areas most threatening to shipping along the inner route, and the major causes contributing to shipping accidents in these waters. Such information would be

useful in preparing contingency plans for an accident resulting in pollution within the area of the Great Barrier Reef Marine Park. The model could also be used to test options for reducing the risk in areas where the current risk levels are thought to be unacceptable.

The project has received much co-operation from members of the Queensland and Torres Strait Pilot Service, via discussions on navigation in the area. Funding for the project has been provided by the Great Barrier Reef Marine Park Authority, Det Norske Veritas, and a Special Research Grant from James Cook University. Funding for the current financial year has also been obtained from the Marine Sciences and Technologies Grants Scheme.



The 'TNT Alltrans' went aground on the reef surrounding Lady Musgrave Island in the early hours of March 25, 1985. The modern, 35,000 tonne (dw) bulk carrier was en route from Gladstone to New Zealand with a cargo of alumina. Damage to the ship's bottom was extensive but there were no injuries or loss of fuel or cargo. After several salvage attempts the 'TNT Alltrans' was finally floated off late on 26 March and left for repairs in Newcastle several days later.

A combined GBRMPA/Q.NPWS team surveyed the site in early April. Fortunately the area of the stranding was mainly sand, with only scattered large coral bommies and isolated patches of branching coral. Consequently damage was localized. Corals within a 90m x 40m area had been crushed by the vessel and many colonies within 50m on either side were partially or wholly dead, probably killed by sediment stirred up by the vessel and salvage tugs.

Fewer coral-associated fish and more herbivorous fish species were present in the area of the impact than in a control area some distance away. The recovery of the area is being monitored by Q.NPWS.



Research

In late 1984, a new road linking Cape Tribulation and Bloomfield was opened to the public. The road was the subject of considerable controversy. A major concern expressed by groups opposed to the construction of the road was its potential to adversely affect adjacent fringing reefs.

The fringing reefs adjacent to the new road lie within the Cairns — Cormorant Pass Section of the Great Barrier Reef Marine Park. Little is known of the geology, geomorphology or ecology of these reefs but some information was obtained during the zoning of this Section, by Dr J Veron and, most recently, by Drs Avril and Tony Ayling.

This information and the high accessibility of these reefs confirms their conservation significance.

Dr Veron made the following observations about the setting of the reefs:

'The reefs are the most extensive fringing reefs of eastern Australia and are the only extensive fringing reefs which are adjacent to rainforest. It is unusual to find reefs adjacent to areas of high rainfall. They have developed because the water shed is close to the coast and the rainforest is drained by numerous local small creeks, not a major river system. They also exist because wave action is too strong for extensive mangrove development.'

The reefs adjacent to the new road form part of a discontinuous chain of fringing reefs between the Daintree and Bloomfield Rivers. Figure I outlines the spatial extent of the reefs.

The Aylings have identified two main reefal structures — a shallow reef slope and a deeper fringing reef.

On the shallow reef slopes, hard coral cover is estimated at 15-30% while on the deeper fringing reefs, hard coral cover is 50-75%, a figure much higher than that reported on most 'outer' reefs.

There has been little study to date of the geomorphological and sedimentation processes of these reefs, although it has been observed that the inshore waters along this coast line are commonly turbid.

Cape Tribulation Fringing Reefs:

Research and Monitoring Program

Ian Dutton, Project Manager
Great Barrier Reef Marine Park Authority



Inshore sediment deposition is uncommon because of strong wave action, although offshore sediments are easily resuspended during the prolonged periods of easterly weather which characterise this area. A research project designed to document the geological and sedimentation history of the fringing reefs is in progress. It is intended that this, and related monitoring studies should help to define natural sediment sources and levels so that only human induced changes can be identified.

A zoning plan has been prepared in respect of the Cairns — Cormorant Pass Section of the Marine Park which adjoins the Daintree-Bloomfield area. Under the Zoning Plan, the inshore fringing reefs from just north of the Daintree River to Cape Tribulation are zoned 'Marine National Park A'. This zoning prohibits collecting, but allows for general recreational activities, including limited line fishing.

The reefs north of Cape Tribulation to the Bloomfield River are zoned 'Marine National Park B'. This zoning is based on a 'look but don't take' philosophy so that the area may remain in a relatively undisturbed state. It is one of the highest levels of protection afforded under the gradient of zones used by the Authority.

The overall objective of the research and monitoring program is to determine what effect (if any) the Cape Tribulation to Bloomfield Road has had or is having on the adjacent fringing reefs. To this end, a project 'mix' was considered most appropriate. The program was defined in close consultation with coral reef scientists from James Cook University and the Australian Institute of Marine Science.

Four complementary projects have been developed — two research projects and two monitoring projects, each addressing an element of the overall program objective. Details are outlined in the table.

A feature of the program is the co-ordination and co-operation necessary between researchers. For example, the recruitment monitoring project is to be extensively assisted in the field by consultants (Sea Research) engaged in the major project (which requires considerable field work).

Information gained from this study should serve a range of ancillary functions:

- it should lead to a better understanding of fringing reef ecosystems, particularly in the mainland coast context;
- it should improve knowledge of the differences and similarities between fringing reef and other communities in terms of species compositions, growth, recruitment and response to perturbation; and

- it will provide a basis for comparison of survey techniques and results under a range of field conditions and over a range of survey scales not previously assessed.

The Cape Tribulation to Bloomfield Road poses a management dilemma unprecedented in the history of the Great Barrier Reef Marine Park. Resolution of that dilemma requires rigorous scientific study leading to identification of what (if any) management action is appropriate.

The research and monitoring program developed by the Great Barrier Reef Marine Park Authority in consultation with the coral reef scientific community has been purpose-designed to meet those needs. It should also offer ancillary benefits in the form of improved survey methods, greater understanding of fringing reef dynamics and input of information to a broader evaluation of the state of the Marine Park.

CAPE TRIBULATION RESEARCH AND MONITORING PROJECTS

RESEARCH

(a) **Effects of disturbed rainforest catchments on adjacent fringing reefs - Cape Tribulation area**

OBJECTIVES:

- to evaluate the impact of unsealed roads and related earthworks on fringing reefs in the Cape Tribulation area.
- to measure changes caused by the roadworks, both within catchments and in the nearshore zone.

RESEARCHERS:

Assoc Prof. D. Hopley,
Mr. P. Holthus (JCU)

METHOD:

Literature Review
Monitoring of:

- rainfall
 - stream level and sediment level
 - catchment characteristics
 - reef flat hydrodynamics
 - inshore sediment levels
- Calibration with other studies.

DURATION: 3 years

(b) **Sedimentary setting of fringing reefs Donovan Point**

OBJECTIVES:

- to document geological sediment facies.
- delineate shallow stratigraphy of peri-reef sediments.
- Core and recover datable material from reef and off-reef deposits.

RESEARCHERS:

Dr. D. P. Johnson
Prof. R. M. Carter, Mr. J. Hills (JCU)

METHOD:

Literature Review
Sidescan sonar mapping
Seismic mapping
Coring and sediment sampling
Radiocarbon dating of core material

DURATION: 1 year

MONITORING

(a) **Monitoring Coral Recruitment -Cape Tribulation Fringing Reefs**

OBJECTIVES:

- to determine whether these are significant variations in coral recruitment between selected sites.
- to assess whether runoff from the new road has affected recruitment rates.

RESEARCHERS:

Dr. V. Harriott
Mr. D. Fisk

METHOD:

Placement of sets of settlement plates at each monitoring site. Each plate covered by *Platygyra* and a small colony of *Acropora palifera* and 6 monthly analysis.

Survey of permanent grids.

DURATION: 3 years

(b) **Monitoring Cape Tribulation Fringing Reefs**

OBJECTIVES:

To determine whether the Cape Tribulation to Bloomfield Road is having/has had an effect on coral, fish and invertebrate fauna of the adjacent fringing reefs.

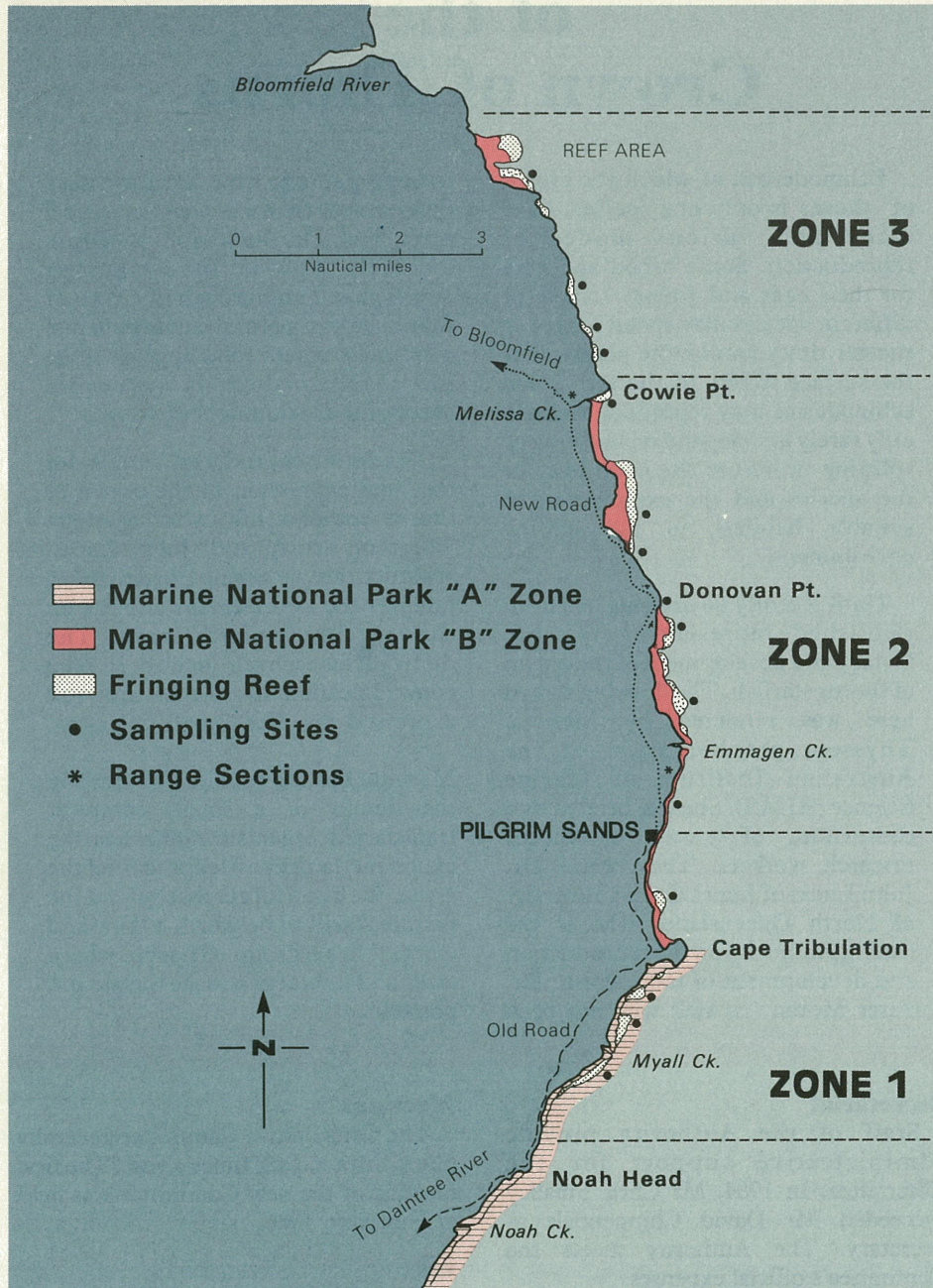
RESEARCHERS:

Dr. A.M. Ayling
Dr. A.L. Ayling (Sea Research)

METHOD:

Initial survey and stratification of sites
6 monthly surveys of fixed sites
line transect surveys
stereo photography
measurement of large colonies
50 x 20 m coral trout counts
incidental observations
overall data analysis

DURATION: 3 years



Appointments to the Great Barrier Reef Consultative Committee

Membership

On 3 October, 1985 the Minister for Arts, Heritage and Environment, Mr Barry Cohen, announced the new membership of the Great Barrier Reef Consultative Committee.

The Committee now comprises seven members nominated by the Commonwealth Government, seven members nominated by the Queensland Government and a member, Mr Graeme Kelleher, appointed directly by the Authority. Apart from Mr Kelleher the fourteen other members have been appointed for three years with effect from 4 October, 1985. All but four sat on the Committee previously.

The four new members of the Committee are:

Mr Andre Maestracci,
Dr Helene Marsh,
Mr Jim Miller,
Mr Leon Wruck.

They replace:

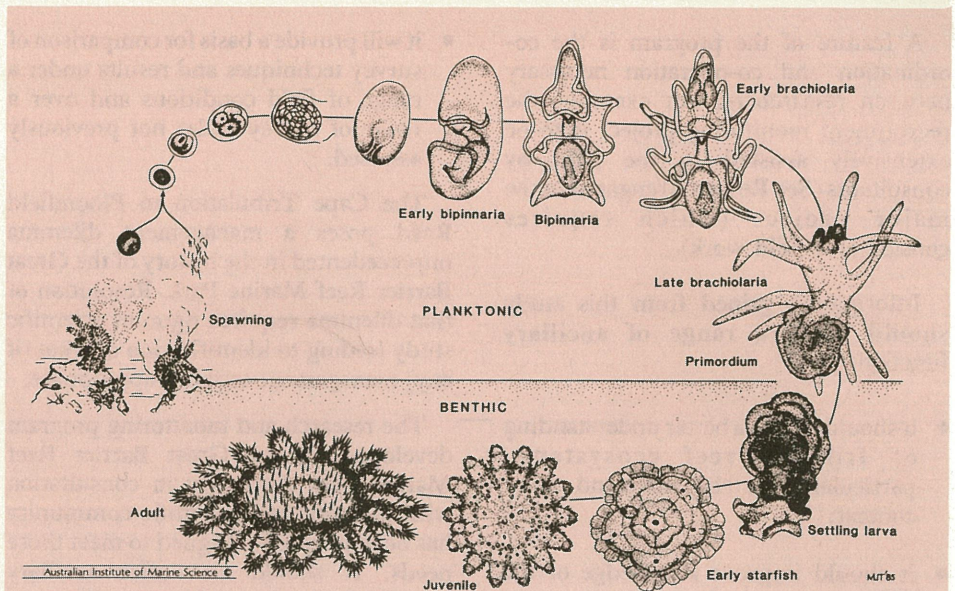
- Mr Ernie Grant, representing the Queensland Department of Harbours and Marine;
- Mr Jock Izatt of the Queensland Game Fishing Association;
- Mr Pat King, Managing Director of the Queensland Tourist and Travel Corporation;
- Dr Patricia Mather, Australian Coral Reef Society.

Mr Izatt (who is also President of the Cairns Game Fishing Club) and Dr Mather were members when the Committee commenced in 1976. Dr Mather then represented the Great Barrier Reef Committee, which has now been incorporated in the Australian Coral Reef Society.

The membership of the Committee reflects the wide range of interests in the Great Barrier Reef Region and includes people with backgrounds and expertise in the areas of tourism, science, recreation, conservation, industry and the Commonwealth and Queensland Governments.

Chairman

Professor Stark, who was Chairman from 1979 to October, 1985 has been reelected to this office.



Life History of the Crown of Thorns

Echinoderms, of which the crown of thorns is only one species, have many and various modes of reproduction. Some brood and care for their eggs and young. Larvae of different species may spend longer or shorter times among the plankton of the surface waters of the sea. Some echinoderms may reproduce sexually only rarely and depend on budding or splitting to ensure the continuity of the species and the exploitation of suitable habitats in the marine environment.

Until recently no drawing had been published representing the life history and development of the crown of thorns starfish. The drawing shown here was rendered by Marietta Thyssen, graphic artist at the Australian Institute of Marine Science (AIMS). She was briefed by a consortium of crown of thorns research workers. They were: Dr. John Lucas of James Cook University of North Queensland, who is the leading authority on the reproduction and development of the starfish; Dr. Peter Moran (AIMS) who has been

investigating the community dynamics of crown of thorns on coral reefs; and Dr. Randolph R. Olson (AIMS) who is investigating development and growth of crown of thorns under natural environmental conditions where food appears to be too scarce ordinarily to ensure successful development of larvae.

The figure reproduced here is not the final expression of the crown of thorns complex life cycle. Marietta Thyssen, artist, and John Lucas, scientist are working together to interpret the arrangement of arms on the late-brachiolaria larva. The difficulties which occur in the communication of science are well expressed by this small dilemma.

Marietta has the problem of drawing the details of a small, complex, transparent organism. John has the experience and knowledge to brief the artist. We often forget that behind the picture - said to be worth a thousand words - lies a group of people whose skills and interaction make the picture possible.

Secretariat

Staff of the Authority provide administrative support for the Committee. In 1984, Mr Chris Smalley succeeded Mr David Chippendale as Secretary. The Authority meets the Committee's official expenses.

Meetings

The Consultative Committee generally meets three to four times a year. The first meeting of the new Committee was held in February, 1986.



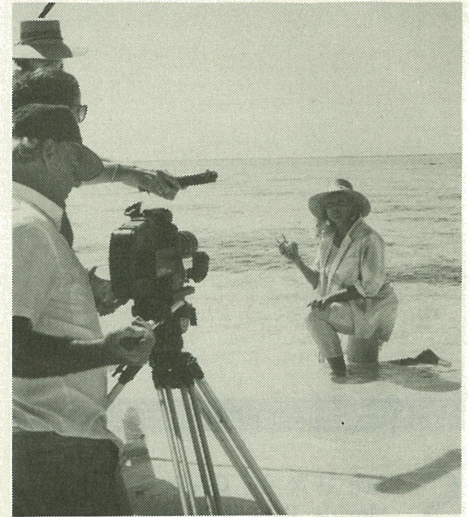
Functions of the Consultative Committee

The Consultative Committee was established under the **Great Barrier Reef Marine Park Act** in 1975. It is seen as an important element in the co-operative arrangements established between the Commonwealth and Queensland Governments for the development and management of the Great Barrier Reef Marine Park. The Committee is being regarded as a model for application to those other complex environmental programs that affect diverse community interests and involve different levels of government, such as south-west Tasmania, and this is indicative of its success. In announcing his new appointments, the Minister confirmed that the Committee advises him, and, through him, the Great Barrier Reef Ministerial Council, on matters relating to the operation of the Act. The Committee also advises the Great Barrier Reef Marine Park Authority on those matters relating to the Marine Park referred to it by the Authority.

The Committee is not required to report on its deliberations to the public or to the organisations from which its members are drawn, but it does encourage members to keep their organisations briefed, in general terms, on matters before it.

The Committee provides a forum for discussion on matters relating to the Great Barrier Reef and the Marine Park and this mode of operation has contributed significantly to its achievements to date. Through the Committee, members have come to understand the problems and difficulties of other interest groups very well.

Individual members have been keen to assist the Authority in its programs, particularly through the dissemination of published information to users and in facilitating public participation in the planning of the Marine Park.



Diane Cilento at work on the production of publicity material used in the recent public participation program for the Central Section of the Marine Park. The Authority is always eager to receive input for its zoning plans from a wide cross section of Reef users. Ms Cilento helped to make successful the television advertising for this campaign.



The Great Barrier Reef is a magnificent natural setting for human imagination to build upon. In August this year that's what Townsville school children were asked to do; let their imagination roam the Reef and create a story, picture or play with a conservation theme — an Adventure on the Reef — and have the chance of winning some exciting prizes. More than 500 entries were received. Here one of the runners-up in the Grade 3 to 5 age group, Nazareth Whaleboat, receives a selection of posters and a record from Alderman Val Valentine of Townsville City Council. The Competition was run jointly by the Authority, Radio 4TTT FM, Queensland National Parks and Wildlife Service and the Townsville Pacific Festival Board.

CONSULTATIVE COMMITTEE MEMBERS

- **Dr Rob Bain**, Director of the Australian Fisheries Service, Commonwealth Department Primary Industry
- **Mr Dale Bryan**, Chairman of the Queensland Commercial Fishermen's State Council
- **Mr Paul Eccles**, First Assistant Secretary, Maritime Safety Division, Commonwealth Department of Transport
- **Mr Eddie Hegerl**, Australian Littoral Society and Queensland Conservation Council
- **Mr Tor Hundloe**, Australian Conservation Foundation
- **Mr Graeme Kelleher**, Chairman, Great Barrier Reef Marine Park Authority
- **Mr Gordon McKauge**, Chairman, Far North Queensland Promotions Bureau Tourism Task Force
- **Mr Andre Maestracci**, Managing Director, Hayman Island Resort
- **Dr Helene Marsh**, Research Fellow in the Department of Zoology, James Cook University of North Queensland
- **Mr Jim Miller**, Director, Division of Dairying and Fisheries, Queensland Department of Primary Industries
- **Mr Keith Neilson**, Assistant Secretary, Tourism Division, Commonwealth Department of Sport, Recreation and Tourism
- **Dr Peter Saenger**, Australian Underwater Federation and the Queensland Amateur Fishing Council
- **Dr Graham Saunders**, Director, Queensland National Parks and Wildlife Service
- **Professor Kevin Stark**, Professor of Systems Engineering, James Cook University of North Queensland
- **Mr Leon Wruck**, Chairman of Directors, Heron Island Pty. Ltd.

Crown of Thorns

Starfish Research

Since 1976 the Great Barrier Reef Marine Park Authority has been very active in monitoring reefs for crown of thorns starfish through surveys and user reports, in promoting scientific research and in informing the public for a better understanding of the crown of thorns starfish phenomenon.

In April 1984 the Authority established the Crown of Thorns Starfish Advisory Committee under the chairmanship of Professor Ken Back AO, Vice Chancellor, James Cook University of North Queensland. The Committee, (known as COTSAC), consisted of 13 Australian and overseas experts and was asked to review research since 1980, to advise on future research and monitoring, and to advise on a program for keeping the public informed on the phenomenon and actions being taken in relation to it.

COTSAC concluded that the destruction of hard corals by aggregations of crown of thorns starfish poses a serious threat to the organisation and functional relationships within some reef communities in the Great Barrier Reef Region, at least in the short term.

The Committee also concluded that current evidence is inadequate for scientists to agree on the nature and significance of the phenomenon of aggregations of large numbers of crown of thorns starfish and recommended a comprehensive program of research, at an estimated cost of \$3 million, over a 5 year period, aimed at improving understanding of the degree of threat to the Great Barrier Reef.

Following this recommendation, the Federal Government provided to the Authority \$0.97 million dollars for crown of thorns starfish research during the 1985/86 financial year.

Co-operation with AIMS

The Authority has signed a Record of Understanding with the Australian Institute of Marine Science relating to the COTSAC recommended research program. GBRMPA will be directly responsible for the research tasks related

to management, (e.g. biological control), hypothesis testing regarding human activity, surface sediments, socio/economic issues, and policy development.

An overall crown of thorns research program co-ordinator is to be appointed by the Authority. The Institute will co-ordinate, for the Authority, the mainly ecological research identified by COTSAC.

Dr Peter Moran, author of an extensive review of the crown of thorns phenomenon, has appointed Study Leader at the Institute. Collaborative researchers will have access to the scientific and logistic capability of the Institute.

Management Related Research Project Areas:-

Among the research project areas that will be directly undertaken by the Authority are:

- Tests of hypotheses regarding human factors which may trigger or exacerbate population outbreaks.
- Socio-economic consequences of major populations of crown of thorns starfish.
- Biological and economic risk analysis study to contribute to assessment of the need for control of crown of thorns starfish.
- Oral history of human use and of experience of crown of thorns on the Great Barrier Reef (GBR).
- Feasibility of biological control by predators and pathogenic organisms.
- Analysis of surface sediments and soft sediment cores to evaluate evidence of previous crown of thorns populations in the GBR.

Ecological Research Projects

The Institute intends to co-ordinate the investigation of major ecological issues with respect to the starfish within four areas:

Population Dynamics of the Predator

- Aquarium and field studies on the ecology of adult and juvenile starfish.
- Biology and ecology of larvae.
- Population genetics of starfish.
- Influence of patches of phytoplankton on the survival of larvae.



- Effect of water currents on larval recruitment.

Community Dynamics of Prey and Ecosystem Context

- Recolonisation and recovery of coral communities.
- Responses of other reefal communities (e.g. fish, soft corals) to outbreaks.
- Effects of outbreaks on the trophic structure of reefs.

Predator — Prey Interactions

- Changes in the distribution and abundance of crown of thorns starfish and corals over the entire GBR (macro-scale studies).
- Changes in the distribution and abundance of crown of thorns starfish and corals over selected individual reefs (meso-scale studies).

Technological and Analytical Methodology

- Mathematical models of the crown of thorns starfish phenomenon.
- Tagging of adult starfish (e.g. possible use of micro-injectable transponders).
- Application of advanced techniques (e.g. remote sensing, geological cores from massive corals) to understanding the crown of thorns starfish phenomenon.

Campers Surveyed

on Attitudes to Fishing Bag Limits

by Terry Walker
Queensland National Parks and Wildlife Service

Queensland National Parks and Wildlife Service commenced day-to-day management of the Capricornia Section of the Great Barrier Reef Marine Park over three years ago. During that time one function has been to monitor feedback from the users of the area. A common complaint has been from island campers who were concerned that other campers were catching excessive quantities of fish on the reef. Campers are one of the major user groups in the Capricornia region and in fact virtually all coral cay camping on the Great Barrier

reef fishing. The first group often caught fish to eat while on the island and sometimes took a few kilograms of fish fillets home with them. The second group used the island largely as a base from which to go fishing and had large freezers for storage of fillets. People in 94% of camper groups participated in fishing activities. Line fishing was considered to be a major activity in 42% of camper groups and a minor activity in 46% of groups. Camper groups reported spearfishing to be a major activity in 16% of cases while a further 41% of groups contained people who made some attempt to spear fish.

Some fishing was carried out from the beach or the reef edge at low tide. However, campers caught most of their fish from small boats at more distant regions on the reef. In 91% of cases camper groups had at least one boat of some description with them (not including sailing dinghies). Some camper groups had as many as seven boats. There was an average of one boat for each 6.8 island campers. In 23% of groups power boats had been driven across from the mainland. In 80% of groups runabouts, inflatables or dinghies were transported to the island by a charter vessel.

Camper support for the introduction of fishing bag limits was particularly high (see Figure). Opposition to bag limits came naturally enough from those whose main activity was fishing. Many claimed that there was no evidence that fish numbers were decreasing. A few campers were also opposed to bag limits because they considered them unworkable even if there were good reasons for reducing the amount of fish harvested.

The question of bag limits for island campers can be broken down into four issues: (1) conservation, (2) aesthetics, (3) equity and (4) enforcement.

(1) The extent of conservation measures needed to maintain reef fish populations around the camping islands was an arguable issue. Some campers who had fished the area for many years were despondent about the decline in numbers and size of fish present. Other campers expressed their satisfaction that fishing was

as good as it was many years ago. Scientific surveys of changes in Capricornia coral trout populations are presently being carried out by Q.NPWS and GBRMPA and these should be completed in 1986.

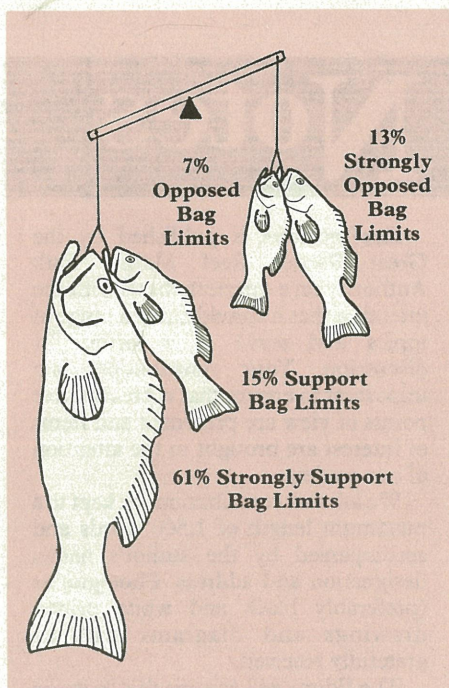
(2) Much of the concern about over-fishing came from people camped near keen fishing groups. The presence of continual fish cleaning and filleting activities on the beach or in the camp area was as important in decreasing holiday enjoyment (aesthetics) as was the knowledge that large numbers of fish were being removed from the reef (conservation) - 'like going on holiday to a fish factory'. Frequently the fish remains were left scattered on the beach or reef flat where they lay for many days.

(3) Some campers considered bag limits would be inequitable if they were to be applied to amateur fishermen and not to professionals. Some also felt it would be discriminatory if bag limits were applied to campers and not to fishermen based on boats who were considered to take far greater numbers of fish.

(4) The effectiveness of bag limits depends on the extent to which they can be enforced. Enforcement problems are considerable. Some examples include: people will continue to fish after they have caught their quota subsequently throwing their smaller fish away as they catch larger ones; one fisherman may catch fish for the combined bag limits of other people in the group who are not fishing; inspecting and counting a person's catch when only fillets have been kept is not practicable and anglers are inconvenienced if required to keep whole fish; bad feelings may result from park officers inspecting ice boxes and freezers. Despite the difficulties of enforcement, bag limits have been introduced for some fisheries in Australia. The Queensland Fish Management Authority, for example, has imposed bag limits on barramundi, spanner crabs, and Australian bass.

There is presently no intention to introduce bag limits for campers or fishermen in Capricornia. However other conservation measures are planned. Foremost are the Reef Appreciation Areas on sections of reefs surrounding camping islands, Effective from 11th January, 1986. Fishing in these areas is prohibited. The situation will be re-examined in 1986 when the GBRMPA calls for public submissions to reassess zoning of the Capricornia Section. At the same time the Q.NPWS will carry out a complementary evaluation of public usage and conservation of the coral cays.

The 'Reflections' editor is willing to print readers' opinions on this matter.



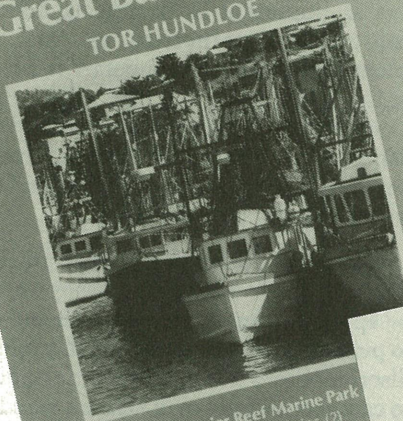
Reef occurs within Capricornia. Those who made complaints often felt strongly that fishing by campers in the General Use 'B' Zone surrounding the islands should be restricted to a 'catch only what you can eat each day' level. In view of the number of complaints and depth of feeling expressed, a survey of camper attitudes to the introduction of fishing 'bag limits' was implemented during 1984 and 1985. Camping permit holders were contacted by postal questionnaire and directly on the islands.

Campers tended to fall into two groups: those who visit the islands to see and experience the natural attractions of the area and those who visit primarily to go

BOOK REVIEWS

Fisheries of the Great Barrier Reef

TOR HUNDLOE



Great Barrier Reef Marine Park
Special Publication Series (2)

The main criticisms one can level at this book are self acknowledged ones. Despite the publication date, most of the figures refer to the 1979-80 period. The author deplors the paucity of statistical information available which renders some of his conclusions tentative.

Despite these minor reservations, the book is the only published source of economic information on Reef fisheries and can be obtained from the Great Barrier Reef Marine Park Authority; price \$6 plus postage.

As part of a marine conservation program to develop an integrated national system of marine and estuarine protected areas, the Australian National Parks and Wildlife Service undertook to compile and maintain an inventory of all such areas declared in Australia. The information in this inventory was supplied by members of the Council of Nature Conservation Ministers (CONCOM), the Great Barrier Reef Marine Park Authority and by State and Territory Fisheries Authorities.

This publication provides a comprehensive reference to assist policy makers and managers, enforcement, technical and education officers, researchers and teachers in educational institutions and others involved. The publication is obtainable free of cost from: Australian National Parks and Wildlife Service, G.P.O. Box 636, Canberra, A.C.T., 2601, Attention: Ms. Jan Carey.

FISHERIES OF THE GREAT BARRIER REEF

Tor Hundloe, Townsville, Great Barrier Reef Marine Park Authority, 1985. (Special Publication Series 2).

This book looks at fisheries in the Great Barrier Reef Region from an economic viewpoint. As the abstract of the book points out *'fishing is the most wide-spread and commercially important activity undertaken in the waters of the Great Barrier Reef'* and hence this book should be of interest to anyone concerned with the future of the Reef.

After a summary of the geographic and economic context in which they operate, there is an account of each fishery. The important recreational fishery receives equal attention to the various aspects of the commercial operations. The latter includes such minor fisheries as aquarium fish collection and pearling as well as their big brothers the prawn, mackerel and barrumundi fisheries.

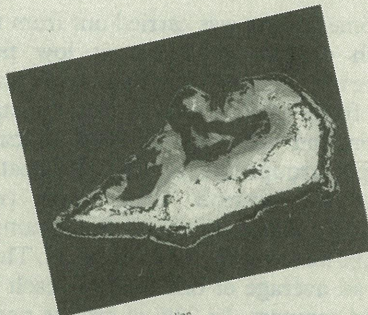
The economic effects are examined in two ways. Firstly, the direct costs and values are considered and then the flow-on effects are analysed to give an overall impression of the place of fisheries in the Regional economy. There is a useful chapter called, **A Guide to Understanding Economic Impact.**

Some very valuable statistics are collected together in the appendices including Queensland and Australian fish production, boat numbers and values and numbers of fishermen.

Inventory of Declared Marine and Estuarine Protected Areas in Australian Waters

VOLUME 1

Edited by Angela M. Ivanovici



Special Publication
[12]
Australian National Parks and Wildlife Service

MARINE CONSERVATION IN AUSTRALIA: AN IMPORTANT NEW PUBLICATION

Inventory of Declared Marine and Estuarine Protected Areas in Australian Waters, Vols. 1 & 2, Edited by Angela M. Ivanovici, Special Publication (12) Australian National Parks and Wildlife Service, 1985.

The Australian coastline is approximately 36,800km long. The coastal and offshore areas encompass a diversity of marine and estuarine habitats which require protection and conservation. The first marine protected area in Australia was declared in 1938, at Green Island off the Queensland coast. Since then, nearly 37 million ha. have been afforded protection under various marine and estuarine protected area categories. This represents less than 5% of the total marine area for which Australia is responsible.

Notes

Reflections is published by the Great Barrier Reef Marine Park Authority on a quarterly basis with the intention that it should cover a range of topics and serve as a forum for discussion. Your contributions are important to ensure that representative points of view are presented and items of interest are brought to the attention of our readers.

We ask that contributions be kept to a maximum length of 1,500 words and accompanied by the author's name, designation and address. Photographs (preferably black and white prints) drawings and diagrams will be gratefully received.

The Editor will assume that material submitted for publication has appropriate organisational approvals where necessary. The Editor reserves the right to reject or modify contributions. If modification is considered necessary, it will be referred to the author for approval.

Contributions should be sent to:

**The Editor
Reflections
Great Barrier Reef
Marine Park Authority
P.O. Box 1379
TOWNSVILLE, QLD 4810**

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