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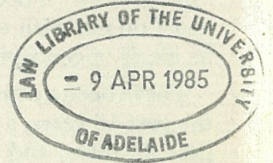
Reeflections

GREAT BARRIER REEF MARINE PARK AUTHORITY

March 1985

Free Issue No. 15

MANTA RAYS IN CAPRICORNIA



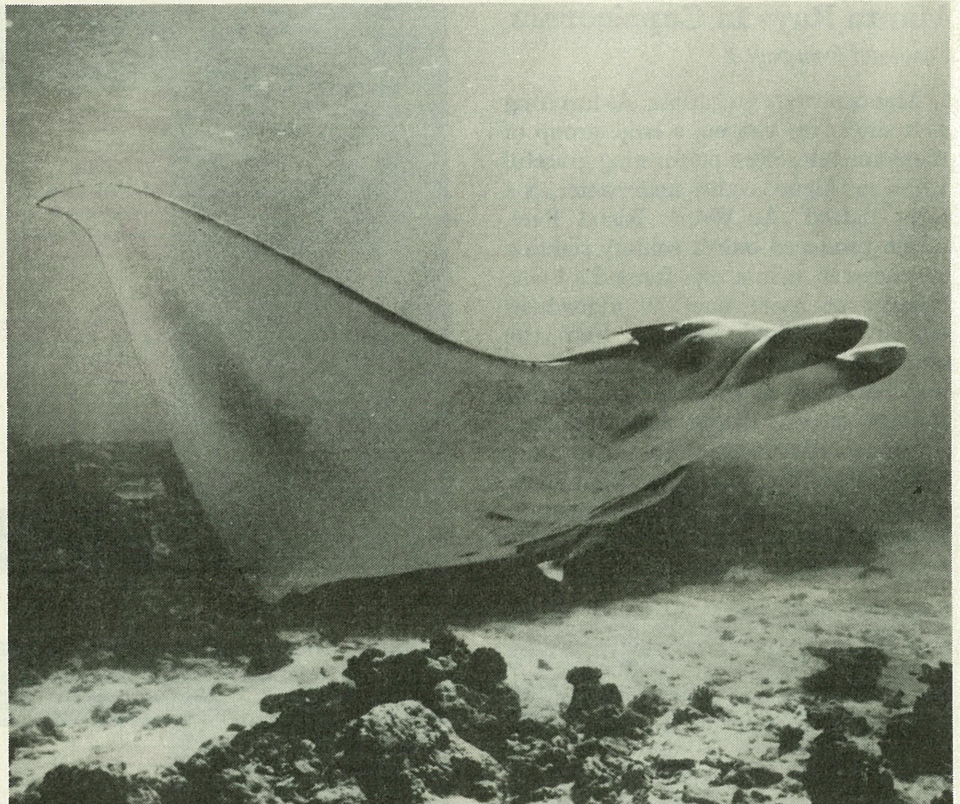
By Mark Simmons

Ranger, Maritime Estate Management Branch
Queensland National Parks and Wildlife Service

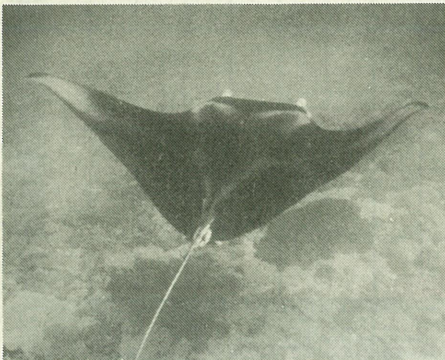
To divers all around the world an unexpected underwater encounter with a giant but graceful manta ray is an experience not soon forgotten. Manta rays often exhibit an affinity for human contact and, like whales and dolphins, they are among that small group of animals that have endeared themselves to humans because, it frequently seems, they like us. Their huge size is offset by a gentle and docile disposition. However relatively little is known about the habits or lifestyle of manta rays.

Since June 1983 the Maritime Estate Management Branch of the Queensland National Parks and Wildlife Service has been recording sightings of manta rays in the Capricornia Section of the Marine Park during routine aerial surveillance patrols. The surveillance program offers the facility for basic distribution studies of numerous marine lifeforms. In the case of manta rays it has helped to shed light on which reefs are the favoured habitats for this species and during which times of the year manta rays are most likely to be seen.

At Heron Island Reef, which lies in the



Manta ray (*Manta alfredi*).



centre of the Capricornia Section, tourists regularly report encountering manta rays at established dive locations. From the first year of observations it is already apparent that North Reef, which lies some 30 kilometres to the north of Heron Island, is the site for most manta ray activity. Both the number of sightings and the total number of rays seen is far in excess of any other locality. Manta ray sightings here are quite consistent throughout the year.

Figure 1 shows the number of sightings recorded for each of the 20 reefs that are regularly surveyed. A sighting is referred to as each distinct group of rays. Figure 2 shows the total number of rays that were seen at each reef for the entire twelve month period. While North Reef has eclipsed all other locations, Heron Island and Lady Musgrave Island Reefs have shown themselves to be reasonably popular sites for manta rays.

Continued on page 2

Letters TO THE EDITOR

Dear Sir,

I have witnessed with profound approval and some concern, the formation of the Great Barrier Reef Marine Park Authority. Overall, its aspirations are indeed commendable, and I do not wish to detract from it, its ideals of conception.

I have been a commercial diver for the past 18 years, a skindiver for the past 27 years, and therefore have a deep commitment and expertise in my own fields to the marine world. However, I must express my concern.

The nitty gritty world we live in must recognise and plan in a realistic

manner the progressive outcome of what will happen to the sea and in particular, the Great Barrier Reef. A basis of honesty must be achieved by all citizens whether they be academic or 'lay' persons as to their input of the management and survival of the Great Barrier Reef.

I have read with great interest the articles printed by the Authority, but cannot help feel at times that something is missing in sincerity in the acclaimed output of some of the authors.

No doubt in their own fashion, they think they are qualifying their existence, however, I feel a more definitive guiding hand is required before the acceptance and publication of their journals.

A need to know by the general public is required to outline exactly what the article is about, the basis of the initial investigations, and follow-

up of such investigation as applicable to real research and proposed implementation. This I feel is acutely required so that others may get behind ideas propounded, or alternatively place other thoughts or concepts to the fore for open discussion.

Too much flat printed word appears to be the foundation of Reeflections. The invitation to others of marine experience could be encouraged for discussions, seminars, printed matter, letters or whatever, which I feel sure would broadened the knowledge of all and not end up as individual coral polyps, the same family, but separate from each other.

Please accept my thoughts as constructive criticism.

Yours faithfully,
ROBERT M. SCOTT

Manta Rays In Capricornia

Continued from page 1

Manta rays are gregarious. As inspiring as a single ray can be, a large group of these animals, often performing graceful loops and figure eights underwater, is a sight indeed. At Wreck Island Reef, which produced only a solitary sighting for the year, manta rays formed a living bracelet of more than 50 individuals which stretched around half the circumference of the reef. This behaviour may be related to courtship and mating activity. It may also be related to such things as water temperature, currents and the availability of food. Continuing observation of these fascinating creatures by Marine Parks officers may eventually help to answer some of these questions.



Like a giant sieve, this manta ray swims open-mouthed, filtering planktonic crustaceans and small fish from the water.

Figure 1 Number of times manta rays were seen at each reef.

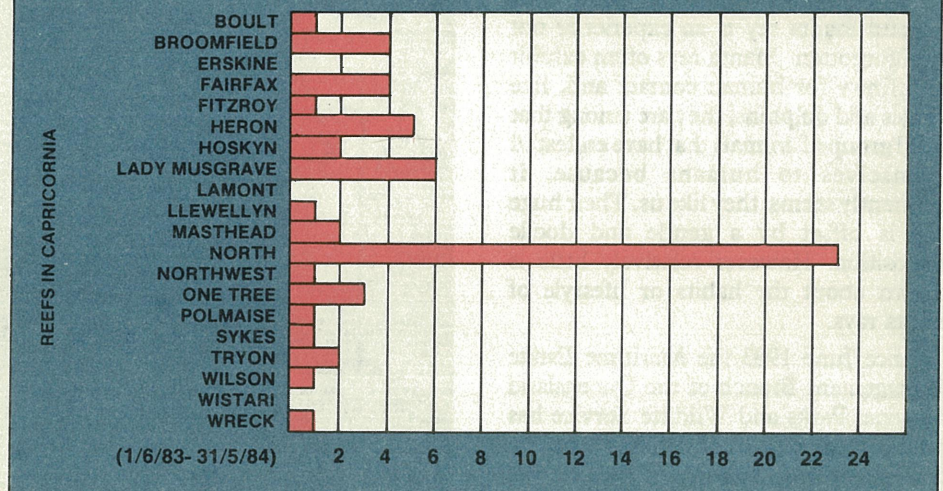
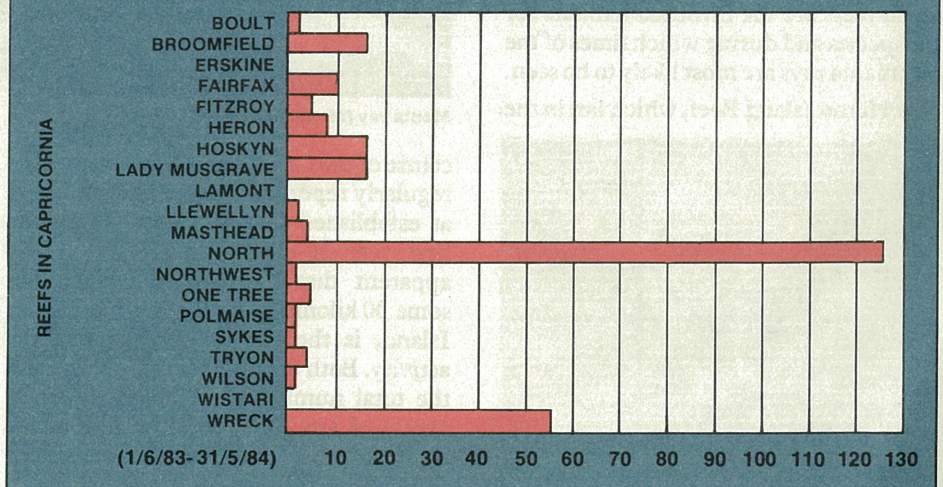


Figure 2 Total number of manta rays seen at each reef.



Proclamation of Central Section and Capricorn Section

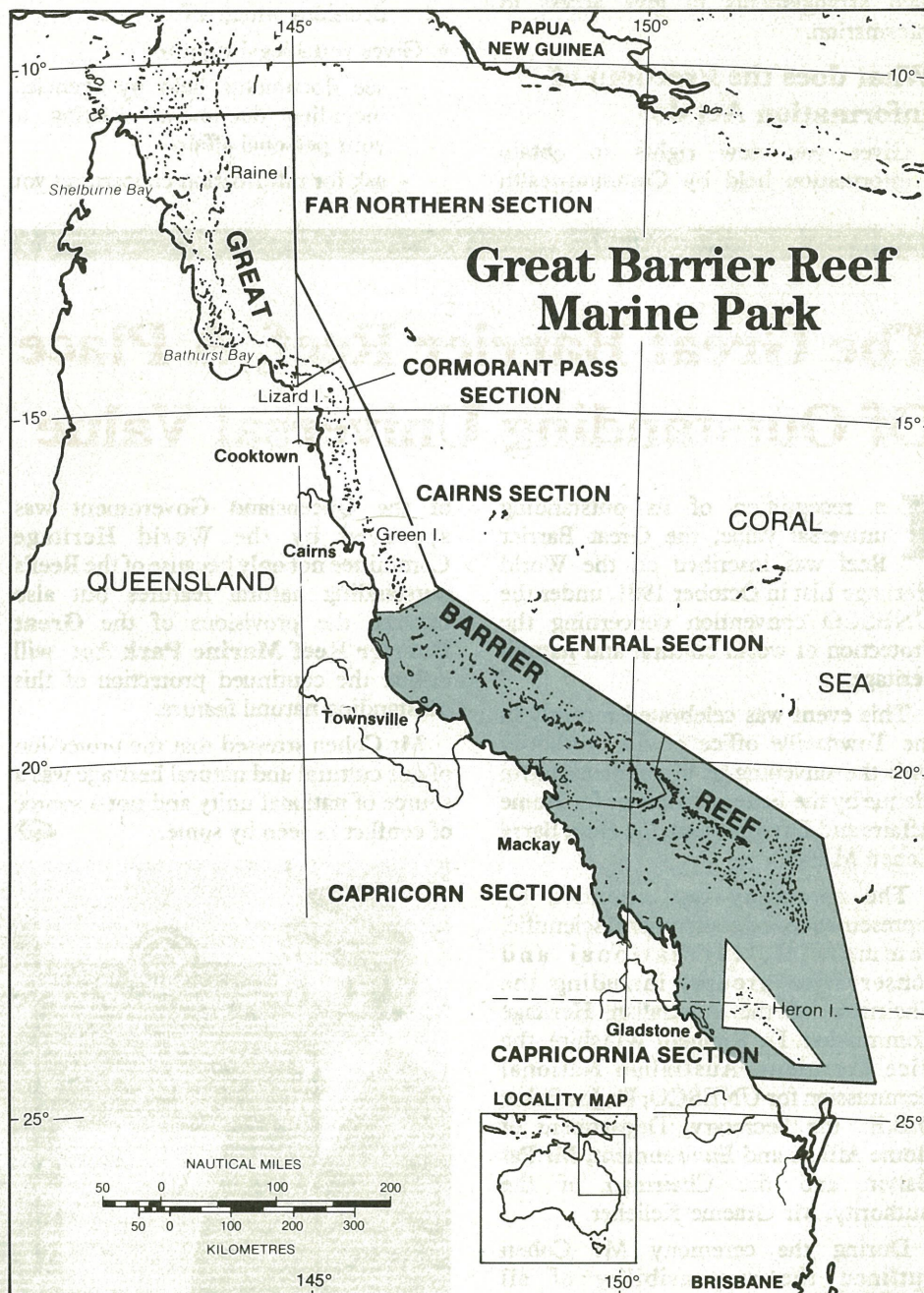
On 11 October 1984, the Minister for Home Affairs and Environment, the Hon. Barry Cohen M.P., announced that the Governor General had revoked certain Proclamations made in 1983 in relation to the Great Barrier Reef Marine Park and declared two new Sections of the Marine Park.

The effect of this action is that four areas of the Marine Park declared by proclamation on 31 August and 30 October 1983 and known as the Southern, Inshore Southern, Central and Townsville Sections have been consolidated into two Sections. The two new Sections, named the Central Section and the Capricorn Section, cover the Great Barrier Reef Region from Dunk Island to the Region's southern boundary below Gladstone.

This consolidation has no effect on existing zoning provisions as none of the four Sections had been zoned and the zoning plan for the Capricornia Section remains in effect.

Mr Cohen explained that the purpose of the consolidation is to improve the cost effectiveness of zoning and management activities and to ensure that Section boundaries conform with the regional management boundaries as administered by the Queensland National Parks and Wildlife Service which is responsible for the day-to-day management of the Marine Park.

Considerable cost savings will result from this consolidation as only two, rather than four, zoning plans will be required. Consequent reduction in administrative



activity will also lead to increased efficiency in the management of the Marine Park.

A public participation program in relation to the intent to prepare a zoning plan for the (newly constituted) Central

Section commenced on 1 November 1984. Information materials and advice on making representations will be advertised and circulated through capital city and regional outlets until 1 March 1985.

Freedom Of Information

Normal access to Information

The distribution and accessibility of information about the Great Barrier Reef Marine Park Authority and the Great Barrier Reef Consultative Committee is a policy commitment of both agencies. Information on the organization, functions and programs of both agencies, and related documents, are generally made available in response to requests made without the formal requirements of Freedom of Information (FOI). FOI legislation does not detract from this process and allows the continuation of such arrangements to give access to information.

What does the Freedom of Information Act do?

- Gives you new rights to obtain information held by Commonwealth

Ministers, Departments and almost all statutory authorities. The Great Barrier Reef Marine Park Authority and the Great Barrier Reef Consultative Committee are both subject to the operation of the FOI Act.

- Requires Commonwealth Government agencies to make available to members of the public
 - information about government agencies, their functions and operations
 - information about rules and practices which are used in making decisions which affect you.
- Gives you a legal right to
 - see documents held by agencies, including documents relating to your personal affairs
 - ask for information concerning you

to be changed, if it is incomplete, incorrect, out of date or misleading

- appeal against a decision not to grant access to a document or not to change a personal record.

How do I make an FOI request?

- Identify the document you want. (The Authority's FOI officer can assist you in making your request.)
- Write the request (FOI application forms are available, but you can also just write a letter). Give as much information as you can about the document you want. For example, give a file number, a reference to a newspaper report about it or describe the subject matter in which you are interested.
- Mention the FOI Act.
- Post or deliver your request to:

The Executive Officer
Great Barrier Reef Marine
Park Authority
P.O. Box 1379
TOWNSVILLE. QLD. 4810

or

The Secretary
Great Barrier Reef
Consultative Committee
P.O. Box 1379
TOWNSVILLE. QLD. 4810

A pamphlet which further explains the operation of the FOI Act, and FOI application forms are available from the above address or by telephoning (077) 81 8811.

The Great Barrier Reef, A Place Of Outstanding Universal Value

In recognition of its outstanding universal value, the Great Barrier Reef was inscribed on the World Heritage List in October 1981, under the UNESCO convention concerning the protection of world cultural and natural heritage.

This event was celebrated recently in the Townsville office of the Authority with the unveiling of a commemorative plaque by the Federal Minister for Home Affairs and Environment, the Hon. Barry Cohen M.P.

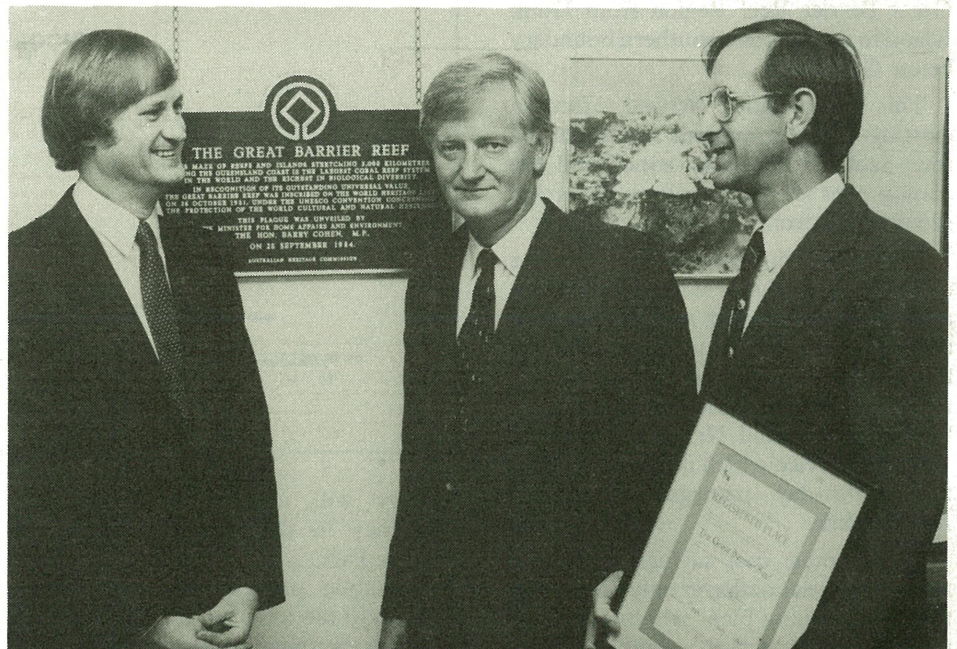
The ceremony was attended by representatives of government, scientific, commercial, recreational and conservation groups, including the Chairman of the Australian Heritage Commission, Dr Kenneth Wiltshire, the Vice President, Australian National Commission for UNESCO, Dr Joe Baker O.B.E., the Secretary, Department of Home Affairs and Environment, Mr Pat Galvin and the Chairman of the Authority, Mr Graeme Kelleher.

During the ceremony Mr Cohen outlined the responsibility of all Australians to work together to protect this natural asset, and to ensure that the Reef is passed onto future generations in good order.

Mr Cohen also noted that the nomination of the Great Barrier Reef by the Federal Government with the support

of the Queensland Government was approved by the World Heritage Committee not only because of the Reef's outstanding natural features but also because the provisions of the **Great Barrier Reef Marine Park Act** will ensure the continued protection of this outstanding natural feature.

Mr Cohen stressed that the protection of our cultural and natural heritage was a source of national unity and not a source of conflict as seen by some.



Dr. Kenneth Wiltshire, the Hon. Barry Cohen and Mr. Graeme Kelleher at the unveiling of the plaque commemorating the inscription of the Great Barrier Reef on the World Heritage List.

Great Barrier Reef Wonderland

On 28 September 1984, the Minister for Home Affairs and Environment, Mr Cohen and the Premier, Sir Joh Bjelke-Petersen announced that under the Commonwealth/State Bicentennial Commemorative Program \$6 million has been allocated for Great Barrier Reef Wonderland.

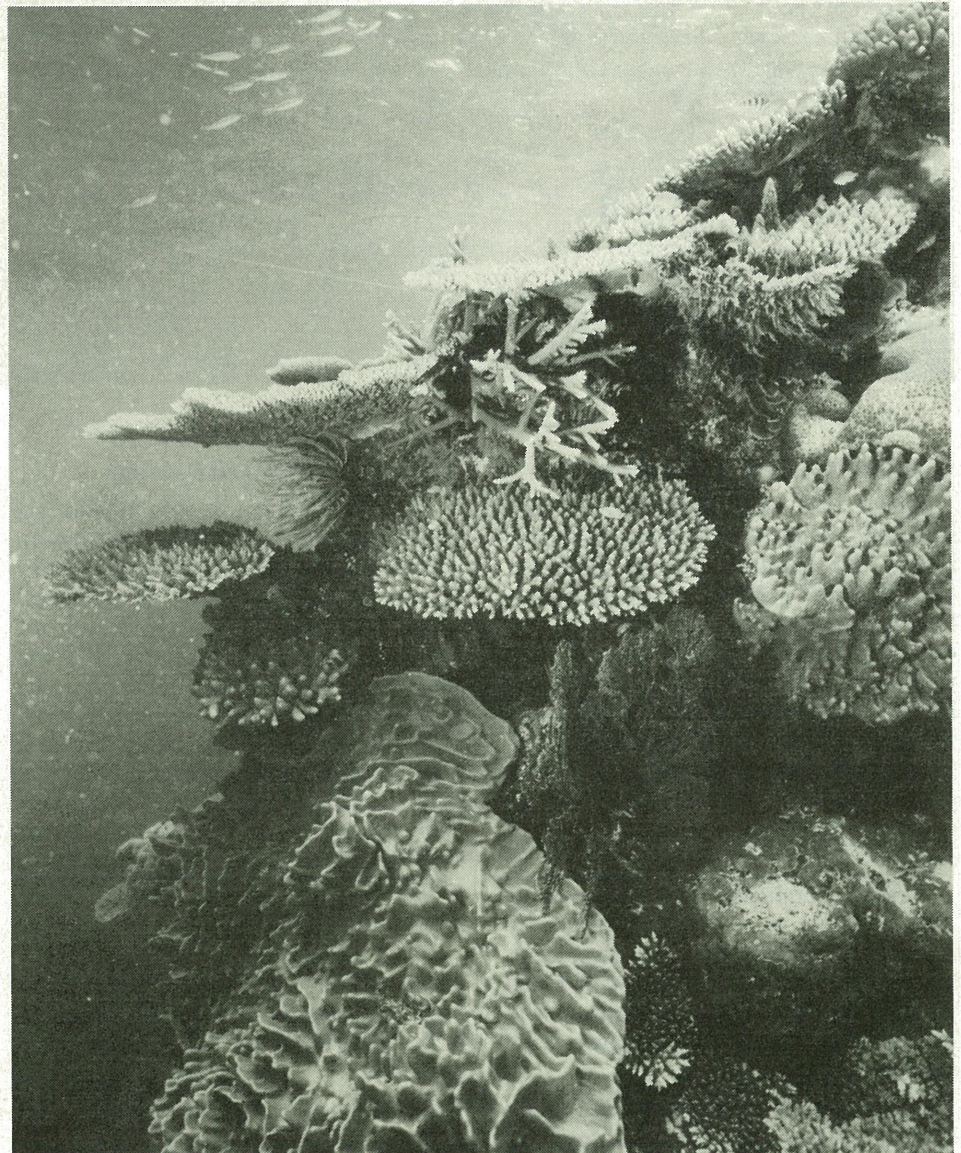
The objectives and components of Great Barrier Reef Wonderland are:

- 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.
- 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 intergration of outstanding facilities having wide appeal and involving Government and private sector funding. These facilities include:
 - an aquarium accommodating a functioning coral reef system with walk through viewing tunnels - this facility will offer a 'Reef experience' which is fascinating and realistic, stimulating the visitor to further explore the Great Barrier Reef. (Bicentennial funding)
 - a branch of the Queensland Museum concentrating on the natural sciences, history, culture and development of north Queensland and providing, amongst other things, specialist exhibits relating to the Great Barrier Reef. (Partial Bicentennial funding, partial Queensland Government funding)
 - Omnimax cinema and commercial precinct of shops, restaurant, ferry services. (Private sector funding)
 - Office of Great Barrier Reef Marine Park Authority and interpretive facilities. (Commonwealth

Government funding).

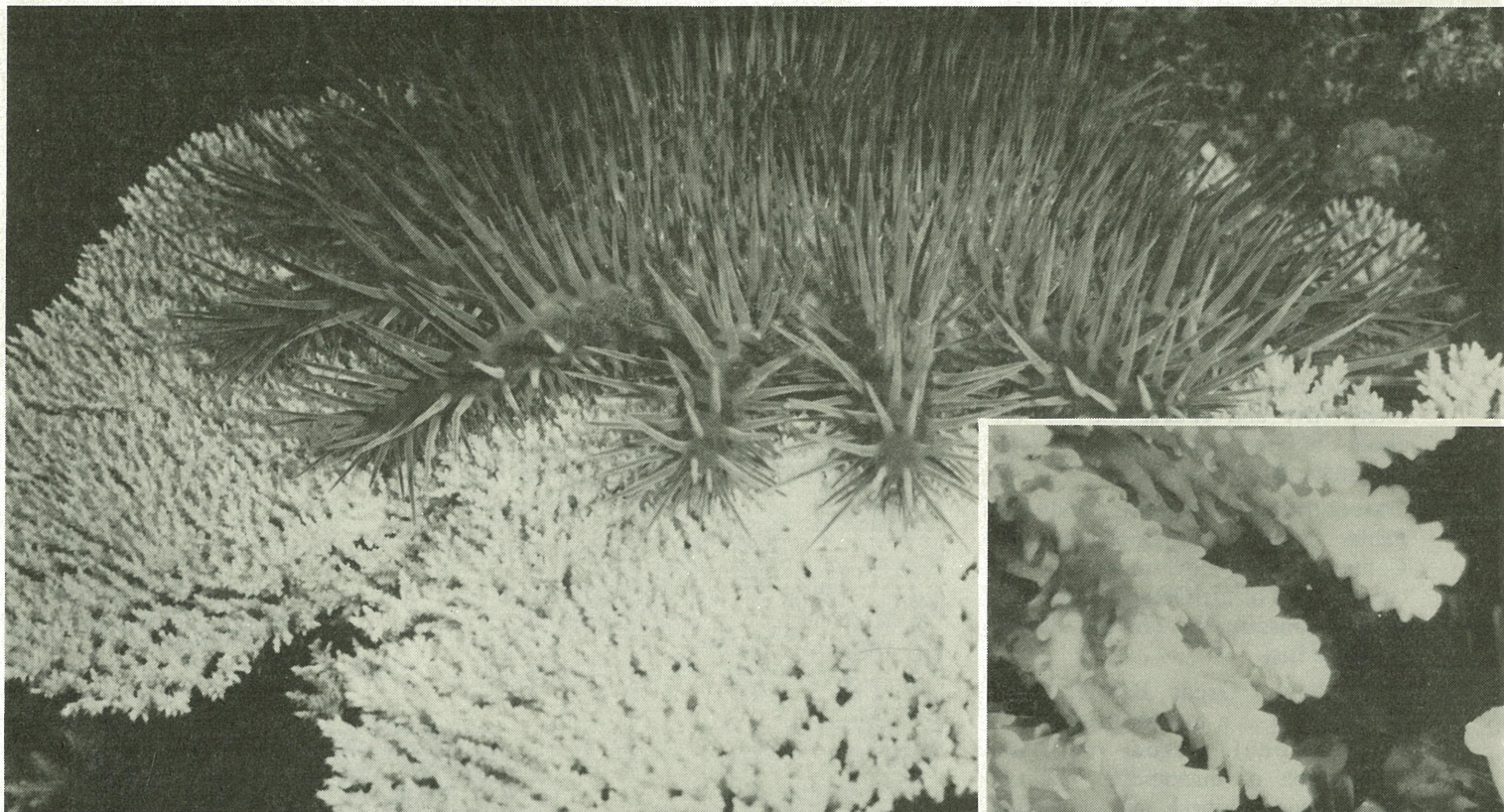
In November 1983 the Great Barrier Reef Wonderland Association was established under the Association's Incorporation Act (Qld.), to carry out all the necessary preliminary administrative steps to prepare for the receipt of major Bicentennial funds and the commencement of the processes of design and construction of the project. Mr. Graeme Kelleher, Chairman of the Authority, is deputy Chairman of the Association.

The Authority has established the Great Barrier Reef Wonderland Aquarium Advisory Committee, which consists of people with expertise appropriate to advising on, and reviewing of, the technical, operational and other matters relevant to the construction and operation of the aquarium and associated exhibits of the complex. The Committee is convened under the auspices of the Authority and provides technical advice to the Authority on the aquarium and associated displays.



An aquarium accommodating a functioning coral reef system with walk through viewing tunnels will be one component of Great Barrier Reef Wonderland.

The Crown of Thorns Starfish



Control by Injection

Since 1981 the Authority, in co-operation with Queensland National Parks and Wildlife Service and the Queensland Fish Management Authority have investigated crown of thorns starfish control methods. Most recently they undertook a research project to provide information on the feasibility of using injection techniques to control crown of thorns populations in limited areas. The project was carried out at 'Cod Hole' in the Cormorant Pass Section of the Marine Park.

A discrete population of approximately 1 000 crown of thorns starfish was reported in 'Cod Hole', an important habitat for the resident colony of tame potato cod *Epinephelus tukula* which is a major natural attraction for divers and snorkellers.

Results to date indicate that 'Cod Hole' has been successfully cleared of starfish. Authority staff will continue to monitor the area.

Data Comparison

A ten-day survey in July 1984 of six reefs between Townsville and Bowen carried out by Royal Australian Navy midshipmen from HMAS Creswell working under the supervision of scientists from the Authority and the Australian Institute of Marine Science (AIMS) showed that five of the reefs, Bowden, Prawn, Shrimp, Kangaroo and Line carried only isolated individual starfish and few feeding scars. These reefs were previously surveyed by Navy teams in 1973 and 1974 when they carried large populations of starfish which caused substantial coral death.

Coral cover data from this recent survey showed that large areas of these reefs now have normal coral cover levels of at least 30% and in many places more than 50%.

Only fifty-three starfish were found on Wheeler Reef, which is the site of an AIMS study of coral and crown of thorns starfish.

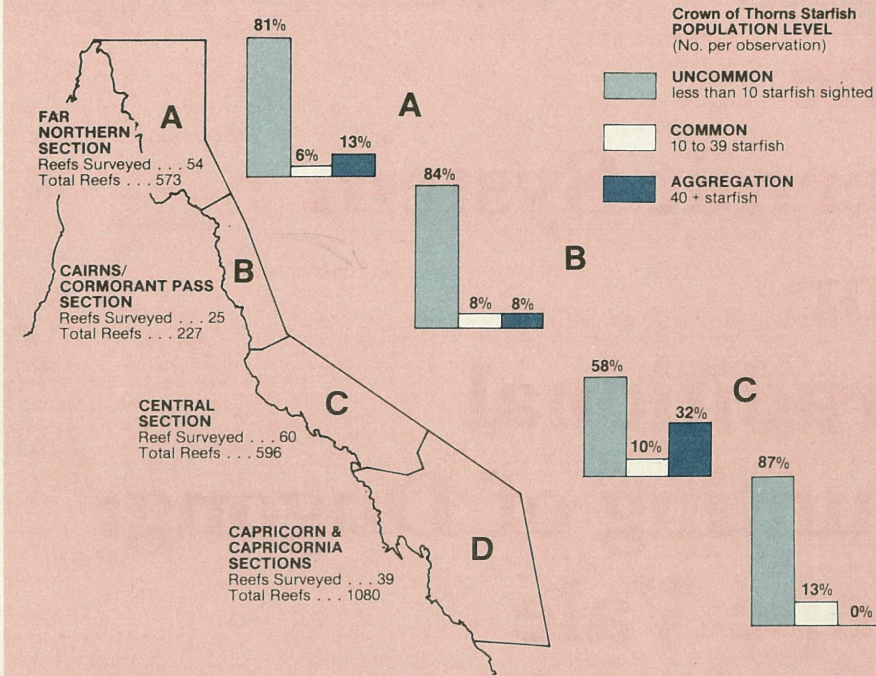
Cairns Section Survey

A survey in August by scientists from the Australian Institute of Marine Science noted crown of thorns starfish activity in the Cairns Section of the Marine Park. The area surveyed extended from Flora Reef, 70 kilometres southeast of Cairns to Jewell Reef, 30 kilometres northeast of Lizard Island.

The scientists surveyed the outer reef slopes of approximately 40 reefs using

DISTRIBUTION OF CROWN OF THORNS STARFISH ON REEFS THROUGHOUT THE GREAT BARRIER REEF REGION

1984



appears to have occurred during the last few years. These reefs now carry very few crown of thorns starfish. In contrast, however, current crown of thorns starfish activity is apparent on the outer reefs north of Cormorant Pass.

While the crown of thorns starfish appeared to have had a marked effect in the Cairns Section, surveys in other areas of the Great Barrier Reef had not found this situation.

Crown of thorns starfish surveys of the Great Barrier Reef Region during 1983 and 1984 now provide a statistically acceptable sample of reefs throughout the full extent of the Region (some 2 000 km long and 345 000 sq km in area.).

Survey results have identified that crown of thorns starfish in the recent past have been most active on the reefs of the central region of the Great Barrier Reef.

The Crown of Thorns Starfish Advisory Committee, the Great Barrier Reef Marine Park Authority and the Australian Institute of Marine Science will continue to keep the public and governments informed about the crown of thorns starfish phenomenon and the research and management action to be undertaken.

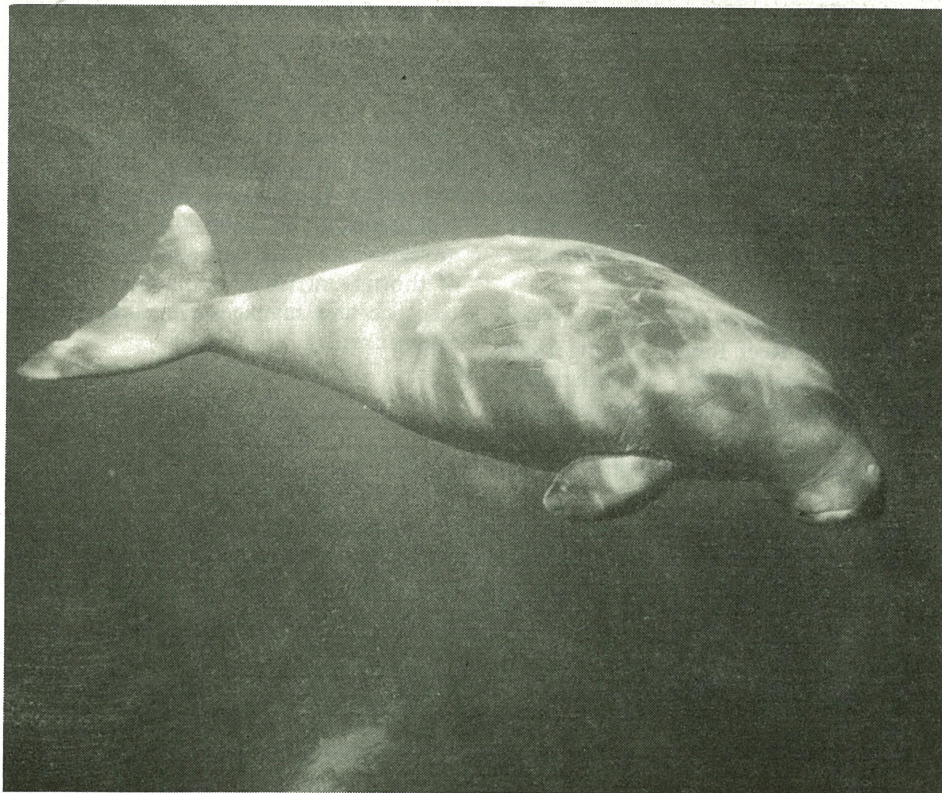
Measuring a juvenile crown of thorns starfish.



manta tow techniques and carried out detailed counts of reef fish populations along transects of the reef fronts of several of the reefs.

Thirty reefs were surveyed in the mid shelf of the Reef Region: good coral cover was found on Saxon, Norman, Moore, MacGillivray and Lizard Island Reefs but the majority of the remaining reefs have exceptionally low living coral cover with extensive dead coral, evidently due to crown of thorns predation. Death

The Permit System For Traditional Hunting of Dugong: Hope Vale



Dugong (*Dugong dugon*).

In November 1983 the Zoning Plan for the Cairns and Cormorant Pass Sections came into operation. The Zoning Plan provides, amongst other things, that the traditional hunting of dugong may only be continued in the Marine Park subject to permits issued by the Great Barrier Reef Marine Park Authority.

The hunting of dugong as a traditional Aboriginal or Islander activity is recognised by the Authority as a reasonable use of the Marine Park. Regulation of hunting is needed in order to conserve the natural resources of the Great Barrier Reef Region.

The effects of the Zoning Plan, and dugong hunting methods and catch limits were discussed with the Hope Vale Aboriginal community north of Cooktown on several occasions during the

zoning of the Cairns Section. However, neither the Authority nor the Hope Vale dugong hunters could fully appreciate the effect of the permit requirement on dugong hunting activities until both parties had practical experience with the permit system operation during a hunting season.

At Hope Vale, dugong hunting takes place mainly during the Christmas holidays when the Hope Vale families generally move from their main, inland settlement to camp for a few weeks at the beaches north and south of Cape Bedford. Authority representatives visiting Hope Vale in November 1983, discussed permit requirements and issued permits for the taking of one dugong to each of 20 dugong hunters who requested one. The figure of 20 derives from a combination of Hope Vale's estimate of their annual dugong catch; and an estimate of the likely sustainable yield of the dugong population in the locality of Hope Vale. The second estimate was provided by Dr. Helene Marsh, a leading dugong researcher at James Cook University, based upon her work on dugong population biology.

Queensland National Parks and Wildlife Service Marine Park Rangers visited the hunting area during the Christmas holiday hunting season to provide assistance and advice should any of the hunters have difficulty with the permit system and to observe how the permit system worked.

Unfortunately, that system as it applied to the 1983 hunting season was not very popular for three main reasons. First, some people in the community did not fully understand the reasons behind the permit system or the way in which it was intended to function. Second, the presence of management staff in the hunting area inhibited hunting activity. And finally, the community was reluctant to accept the introduction of restrictions on an activity which had previously been largely unconstrained by other than community requirements.

Since the beginning of 1984, officers from the Authority and the Queensland National Parks and Wildlife Service have held discussions with Hope Vale representatives to improve arrangements for issuing permits to Hope Vale dugong hunters. Hope Vale people identified a need for information about dugongs and their vulnerability, and about the hunting permit system. Meetings were not seen as an effective method of conveying the necessary information to all of the residents of the community.

As a result, the Authority and the Service have jointly produced a video tape program with assistance from the Hope Vale community. The program's script

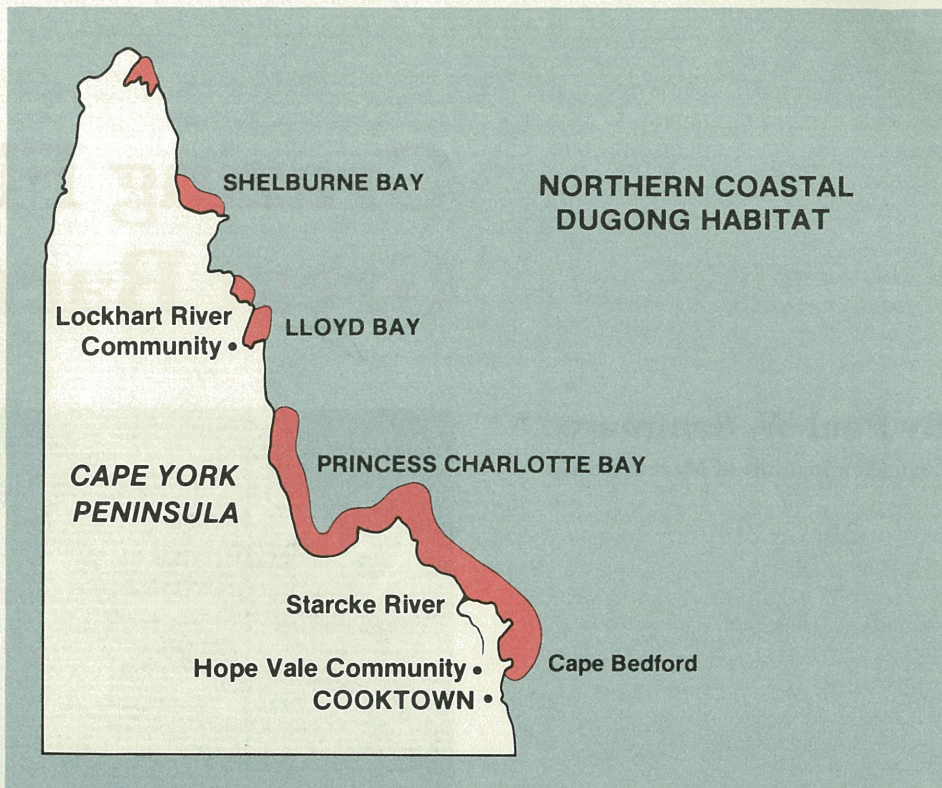
was substantially revised and extended by Hope Vale representatives and is narrated by a member of the community, Pastor George Rosendale. The use of video tape was favoured because of the popularity of video equipment in the community and because of its versatility as a medium for communication.

The purpose of the program is to convey two messages. The first message is an explanation of public concern for the survival of dugongs, carrying the implication that dugong hunters need to share that concern if they are to have dugongs to hunt in the future. The second message is a statement that both the Commonwealth and Queensland Governments are regulating the taking of dugongs. The permit system being developed in relation to Hope Vale is a part of the overall approach which will apply to all Aboriginal and Islander communities hunting in the Marine Park. People other than Aboriginals or Islanders are not permitted to take dugongs.

A poster featuring the dugong has also been jointly prepared by the Authority and the Service for public distribution.

Discussions with Hope Vale have done much to aid the Authority's understanding of the role of dugong hunting in an Aboriginal community and the effects of the Authority's permit system. The number of dugongs which may be taken in any particular area is firstly constrained by the sustainable yield of the local dugong population. Dr Helene Marsh, with financial support from the Authority and Marine Sciences and Technologies Grants Scheme, and co-operation of the Queensland National Parks and Wildlife Service, is extending her dugong research to provide a basis for monitoring the dugong population in the areas in which the Hope Vale community has traditionally hunted, and in other areas of the Great Barrier Reef Marine Park.

The Authority will build upon experience with the management of dugong hunting at Hope Vale to develop guidelines which may be applied throughout the Marine Park. The Authority is also keen to develop its ability to communicate effectively with Aboriginal and Islander communities so that management strategies may be developed which will be appropriate to the needs of the communities, while protecting the dugong. Dugong hunting at Hope Vale is an example of situations in which a fine balance must be found between the needs of park users to reasonably use Marine Park resources, and the obligation to protect an endangered species.



A Hope Vale community resident making a wap, the traditional spear used in hunting dugongs.

Grazing Fish and the Great Barrier Reef

By Paul W. Sammarco *
Australian Institute of Marine Science

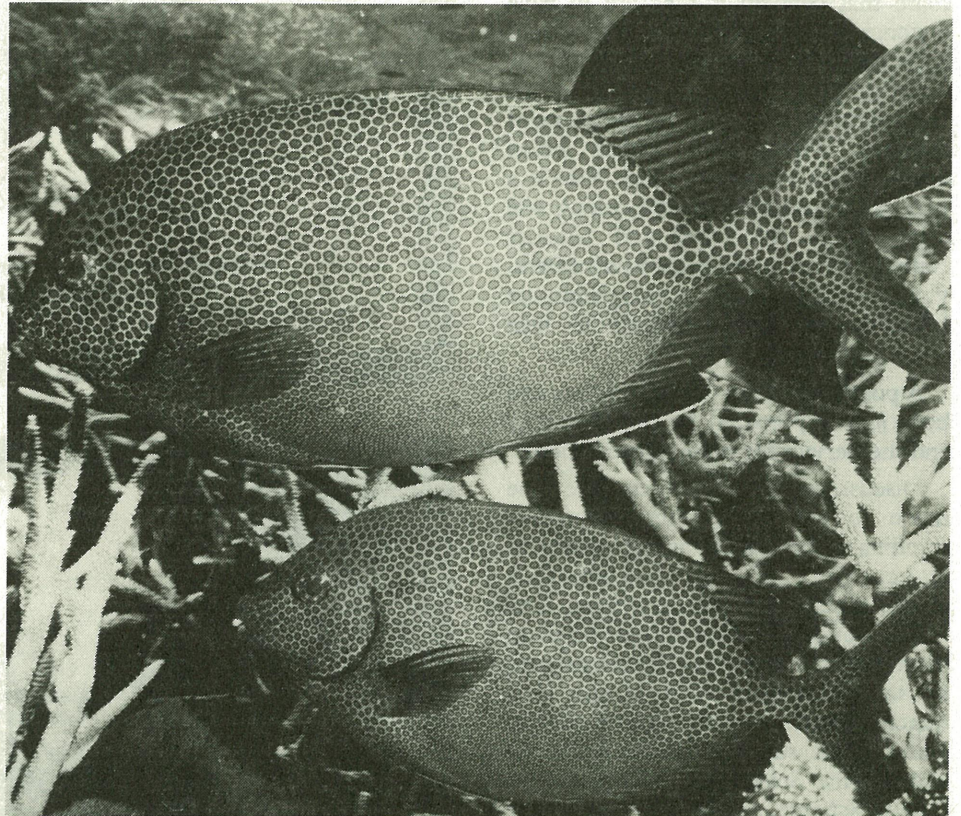
One striking feature of the Great Barrier Reef is its varied and abundant fish populations. The grazing fish of the Great Barrier Reef include the parrotfishes and surgeonfishes and play an important and multi-faceted role in the reefal community.

The accompanying diagram summarizes in part how grazing fish are integrated into the reefal community. It identifies and traces in numerical sequence some of the organisms and ecological processes which they affect. It also identifies some activities which in turn affect the grazer populations.

Many of the fish which are taken by both amateur and professional fisherman are predators (1). Coral trout are a good example of this. These predatory fish obtain their food from lower levels in the food web, and grazing fish would be included among the prey (2).

The activities of grazing fish affect coral reefs in many ways. Grazers alter the abundance and types of algae in a given area (3). For example, a generally ungrazed area might be dominated by tall fleshy red algae while some heavily grazed areas would appear almost bare to the human eye. But, upon closer examination, microscopic algae are still found to be present.

Algae convert carbon dioxide dissolved in the water into sugars and other organic materials by photosynthesis, releasing oxygen as a by-product (4). Grazing can affect the rate at which this occurs. In fact, as grazing intensifies, the rate of photosynthetic activity actually increases. This is mainly because some algae grow



faster when they are cropped, and many of the species of algae which survive intense grazing are themselves fast-growing micro-algae.

All plants and animals require organic nitrogen for growth and development. Most of the nitrogen in the world, however, occurs in the atmosphere in an inert form (N_2) unavailable for use. Blue-green algae are one of the very few groups of organisms which can convert it into a usable form. Grazing by fishes affects the rate at which this conversion takes place on the reef (5). As reef surfaces are grazed, minute blue-green algae flourish in the micro-crevices of the limestone and the rate of nitrogen-processing increases. More usable nitrogen may then be made available to the reef community through the activities of these algae (6).

Some grazing fish, particularly parrotfish, do not feed exclusively on algae but also prey on live corals, consuming both tissue and the limestone skeleton (7). This affects survivorship in the corals and can also change their

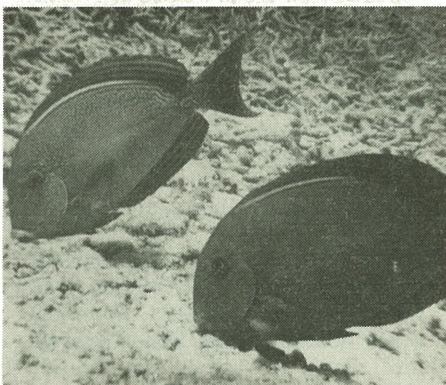
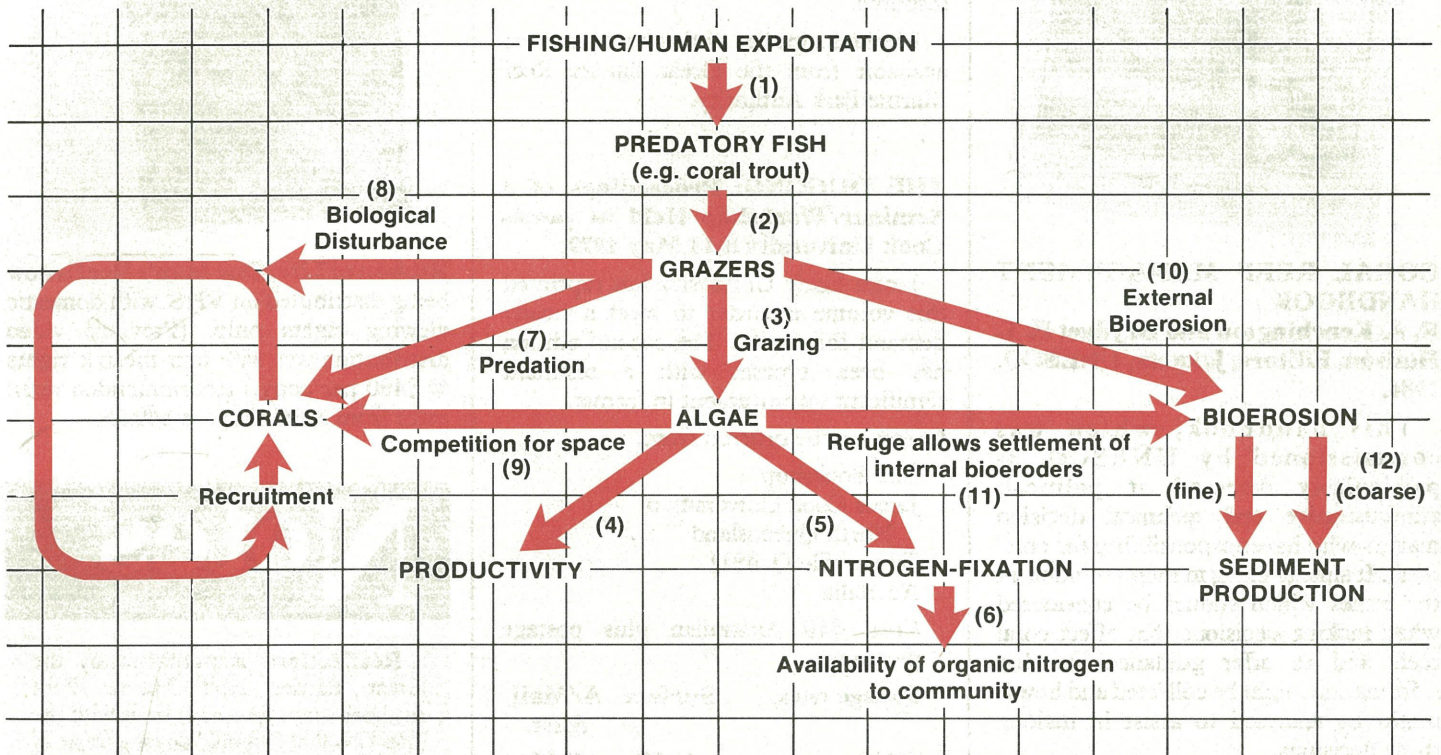
Gold-spotted rabbitfish (*Signatus punctatus*).

Ring-tailed Surgeon-fish (*Acanthurus xanthopterus?*).

growth form. When grazing on dead reef substrate (primarily for the purpose of consuming micro-algae), they may also accidentally remove newly settled juvenile corals (8). These juveniles are almost imperceptible to the naked eye, being less than 1 mm in size. High rates of grazing can disturb large numbers of juvenile corals.

Algae and various other benthic organisms exhibit much faster growth rates than corals and could easily

This diagram summarizes in part how grazing fish are integrated into the reefal community.



overgrow them if grazers were not present to keep the abundance of these organisms in check (9). Thus, optimal conditions for both settlement and survival of young corals occur at intermediate grazing pressures. There a balance is achieved between overgrowth by algae (competition for space) and removal of the juveniles (biological disturbance).

Some grazing fish also ingest large quantities of reef substrate. They scrape off pieces of the relatively soft reef

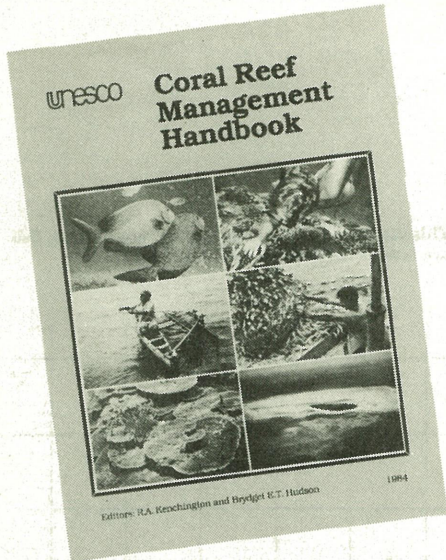
limestone, crush it, and deposit it back onto the reef as sediment when they defecate (10). Large fish produce coarse sandy sediment while smaller fish produce finer material. Without these grazers, coarse sediment production would be produced. The algae would grow quickly and provide a refuge for many animals which bore into the reef substrate, such as bivalves, sponges, and worms (11). These boring animals weaken the reef limestone from the inside, making it subject to breakage, particularly during storms. The sediment produced by such borers when they excavate is a fine silt. Thus, grazing not only affects the rate at which sediment is produced but also the type of sediment produced (12).

Clearly then, grazers play an important role in the Great Barrier Reef. They affect the survival of juvenile and adult corals, algal productivity, the nitrogen-fixing activities of blue-green algae, sediment production, and the stability of reefal structures. Understanding the Great Barrier Reef is like trying to piece together

a large jig-saw puzzle, and the set of interactions in which grazing fish are involved represents only one of many pieces which contribute to the understanding of the overall pattern. By exploiting predatory species on the reef, we will most likely affect these grazers in some way. Secondary effects may be expected to follow. At this point, we simply do not know whether we are affecting grazer populations but research presently underway is leading to some of the answers.

* (Dr Paul W. Sammarco is a research scientist at the Australian Institute of Marine Science in Townsville, Q. He has worked on coral reefs in the Caribbean and Australia. One of his main research interests is the manner in which grazing animals affect various members of the coral reef community and the ecological processes with which those species are linked.)

BOOK REVIEWS



CORAL REEF MANAGEMENT HANDBOOK

R. A. Kenchington and Brydget E. T. Hudson, Editors, Jakarta, UNESCO, 1984.

This handbook, which was commissioned by UNESCO, is particularly directed at political, administrative and technical decision makers who have responsibility for coral reefs. It aims to bring to their attention all the issues which should be considered when making decisions that effect coral reefs and to offer guidance in what information might be collected and how it might be analysed to assist in making those decisions.

The book starts with an executive summary which outlines the content of the later chapters. The contributors are all acknowledged experts in their field and include both Australian and overseas workers. Among the contributors are staff and former staff of the Great Barrier Reef Marine Park Authority. Section 2, Background to Management, deals with man's use of coral reefs, considers how this impacts reefs and what, consequently, the needs for management might be.

The third section reviews the types of legislation and options for management, while the fourth section considers the elements to be considered in developing a coral reef management plan. Areas dealt with in this section include remote sensing as a management tool; the value of economic and other scientific investigations for planning; how to involve users in management planning and the implications of traditional uses of reefs and lagoons.

Later sections consider such topics as staff training, surveillance and enforcement and monitoring. The book concludes with an extensive list of sources

of international co-operation and a 30 page bibliography.

The work is interesting in having identified a specific information need and attempting to directly address that need. Both its content and its UNESCO distribution should ensure its success in its stated purpose. It should also have an audience among all those interested in the future of coral reefs as a managed resource.

Limited supplies of this handbook are available from the Great Barrier Reef Marine Park Authority.

THE DUGONG: Proceedings of a Seminar/Workshop Held at James Cook University 8-13 May 1979.

James Cook University has reprinted this volume in order to meet a steady demand for copies. The second edition has been typeset with a resultant significant improvement in format.

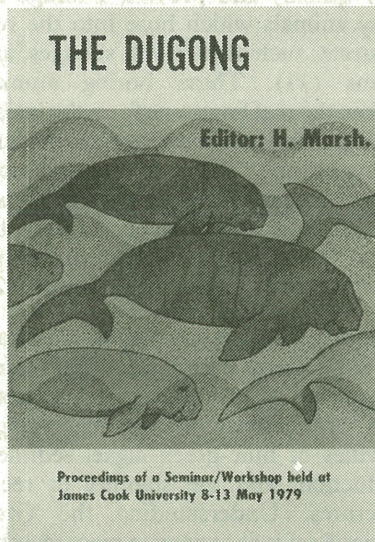
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Other countries	\$1.40	

All orders from overseas should be accompanied by payment in Australian dollars by bank draft or international money order made payable to the above.



Ribbon of Life: One Man's Reef is now being distributed on VHS, with domestic viewing rights only. (Previous video distribution was with non-theatric rights @ \$480 per copy.) Recommended retail price from ABC shops is \$49.95.

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:
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