

Reeflections

GREAT BARRIER REEF MARINE PARK AUTHORITY

September, 1986

Free Issue No. 18



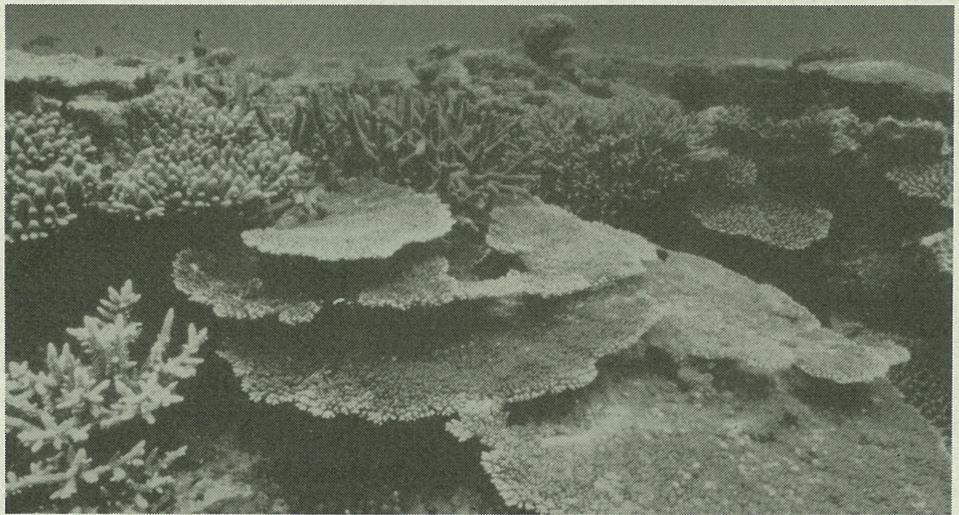
Park Management

Managing Michaelmas Reef and Cay

Michaelmas Reef and Cay is an area of outstanding natural beauty located within easy range of Cairns, 43km to the south-west. The Cay is small (300m x 60m) and treeless. A low growth of herbs and grasses provides stabilizing ground cover to its fine white coral sands. Seabirds are always evident on this island which supports the greatest nesting numbers of any island in the Cairns Section of the Marine Park. The Reef has a diverse and abundant marine fauna, including much hard coral cover. The northern lee of the Cay provides a safe anchorage and a protected swimming and snorkelling area.

Such assets attract many visitors, both locals and tourists. The challenge for management is to help these visitors enjoy their experience of the area while preventing damage to the very features they come to see. Some of the problems that management seeks to avoid are damage to coral from boats, anchors or people, disturbance to the nesting seabirds, improper disposal of human wastes and food scraps, trampling of the cay vegetation, littering and crowding.

Michaelmas Cay is particularly suitable for ground nesting seabirds because it is free of predators such as cats and rats and because it has a good cover



of low vegetation. Sooty terns and common noddies dominate the seabird numbers, but fifteen other seabird species were recorded during 1983-84. A total of six species breed on the Cay. At the peak of sooty tern nesting in excess of 30 000 birds may be present on the Cay.

Disturbance of nesting birds results in adult birds being flushed from their nest sites. Eggs and chicks may be accidentally damaged by adults in their haste to leave. Once exposed the eggs and chicks are far more susceptible to



mortality from overheating in the hot tropical sun or from predation by silver gulls.

Michaelmas Cay is a Queensland National Park and a declared Fauna Sanctuary. The Reef and surrounding waters are part of the Marine Park and have been zoned Marine National Park 'B'. This is an ideal situation for GBRMPA and Q.NPWS to work together to ensure, by complementary management, that the whole Michaelmas area is managed in the best interests of both the environment and its users. Work is underway to develop a management plan that will provide a sound practical strategy for achieving these ideals.

In addition a research program is being jointly conducted by Q.NPWS and GBRMPA to determine the effects of various human activities on the Reef and the seabirds as well as on the Cay itself.

Activities in the field have already started. Q.NPWS officers regularly visit the Cay to monitor the seabird colony and to talk with visitors and tour operators. Camping is not permitted on the island and visitors are asked to avoid certain areas in order to limit disturbance to the vegetation and the birds. With care, sound management and good will Michaelmas Reef and Cay can continue to be one of those special places where people can enjoy themselves in harmony with the natural environment.

DISCOVERIES OF

JUVENILE CROWN OF THORNS STARFISH

One of the most mysterious aspects of the 'crown of thorns starfish phenomenon' is that huge numbers — sometimes several millions — of large, mature adult starfish suddenly appear on a coral reef, consume much of the coral over several years, and then equally suddenly disappear. Where the young starfish come from has remained a mystery for almost 25 years since the first infestations were reported.

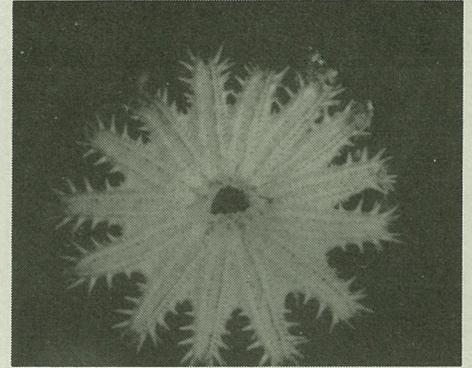
'This is a grey area in the ecology of the starfish and is one of the main reasons that the crown of thorns starfish is so poorly understood,' states Dr. Peter Moran, the AIMS study leader.

The missing years of the starfish have been recently discovered by Dr. Leon Zann of the Authority's Research and Monitoring Section while working in Fiji which has suffered similar outbreaks of the starfish to the GBR.

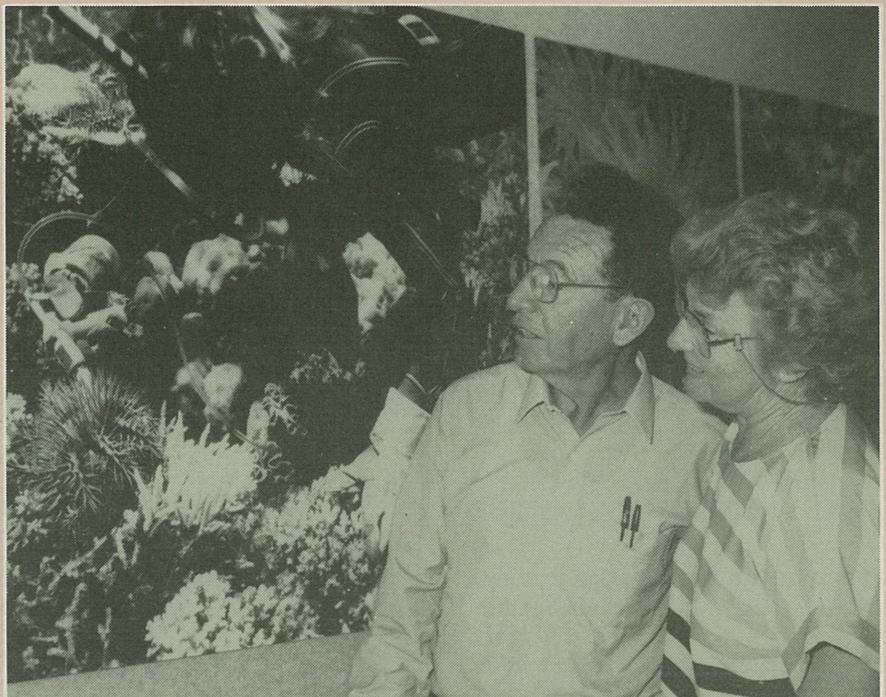
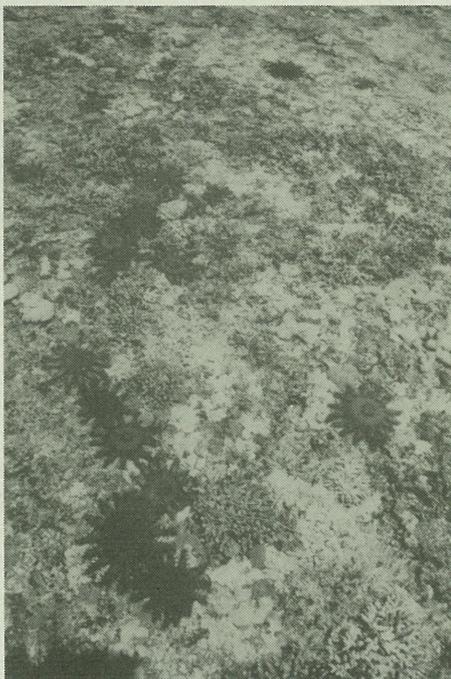
The small, cent-sized juvenile crown of thorns were first found in great numbers under rocks and dead coral along the windward reef crest of Suva Reef in 1984 after five years of monitoring settlement on the reef. They were initially feeding on encrusting coralline algae but at an age of about 12 months switched to a coral diet after which they began to grow very rapidly. They were initially well hidden deep down under the reef surface but at age 20



months emerged to openly feed on corals. At this time they were about 150mm in diameter, the size at which they are generally first seen in infestations on the Great Barrier Reef. They began to reach sexual maturity at age 23 months and at 27 months had moved off the reef top onto the reef slope in deeper water.



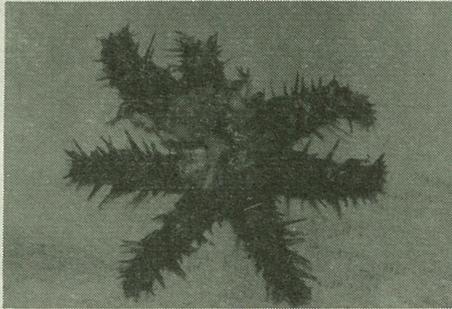
During the study in Fiji, the juvenile starfish were affected by a disease, which together with cyclones and predation, inflicted over 99% mortality. Bacteria and virus particles, which may have great potential as a biological control, have been isolated from the diseased starfish by scientists at James Cook University in research funded by the Authority.



Professor John Swan chaired a meeting of the Crown of Thorns Starfish Advisory Review Committee in Townsville in February. The Committee recommended to GBRMPA the first year of a four year program of co-ordinated research into the crown of thorns starfish phenomenon on the Great Barrier Reef. The Committee said that it

remained convinced of the importance of obtaining a greater understanding of this phenomenon because of its widespread occurrence throughout much of the Pacific region.

Professor Swan is shown here with Ms Peg Hayles who represents the tourist industry on the Committee.



The discovery of an extensive population of juveniles in Fiji is already paying dividends here. Scientists funded by the Authority's COTSAC program have used this information in their searches for juvenile crown of thorns on the Great Barrier Reef and in the last few months have located them on Pelorus Island Reef, and on Rib, Beaver, John Brewer and other reefs.

NEW RESEARCH ON CROWN OF THORNS STARFISH

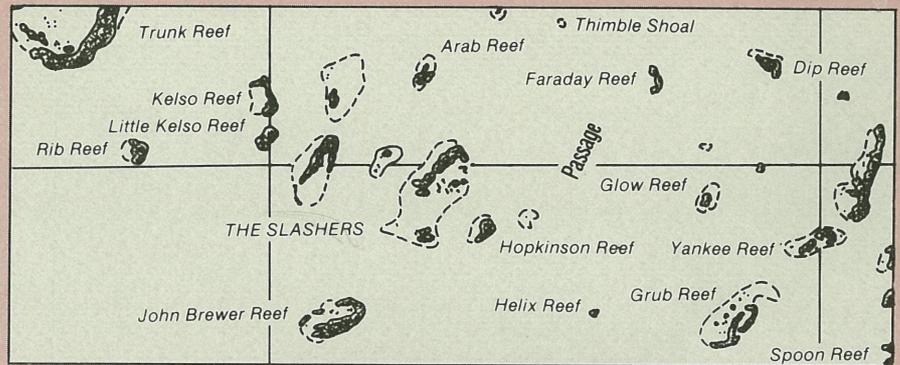
Using the funding provided by the Federal Government, and described in Reeflections 17, a major research program is now underway to investigate the general ecology and management aspects of the coral-eating crown of thorns starfish. In what must be the most intensive research effort ever conducted in Australian waters, almost 60 research scientists from a score of research institutions are engaged in studies of the starfish.

The program is an exciting one and involves such 'hightec' tools as satellites able to scan levels of plankton from space, and studies of minute virus particles which may cause epidemics in the starfish.

Major projects initiated by the Authority include: a survey of predators of the starfish, a study of ocean productivity to determine if there is a link with infestations, a study of the patterns of infestations elsewhere in the Indo-Pacific, studies of the socio-economic effects of the infestations on the tourist and other Reef industries, studies of their diseases to determine if a biological control is feasible, and a study of reef sediments to determine if there were infestations in pre-European times. Ecological projects coordinated by the Australian Institute of Marine Science include studies of the planktonic larvae, feeding rates and preferences, recolonization of corals, effects on fish communities, the distribution and abundance of *Acanthaster* on the Reef, use of Landsat to study reef damage, and modelling studies.

All of the studies are now underway and already there have been some exciting discoveries. However, it is recognised that a long-term research effort is required if the reasons for the infestations are ever to be understood. There is widespread concern that the future funding of the program remains uncertain.

THE SLASHERS



In 1842 Her Majesty's troopships, **Kelso**, **Arab** and **John Brewer** embarked from Sydney in the company of the merchant ship the **Hopkinson**. The troopships were carrying the 78th Foot Regiment (nicknamed the Slashers) to Bombay to quell an Indian uprising. They planned to travel through the inner passage of the Great Barrier Reef and the Torres Strait.

At dawn on the 6th of June during a heavy southeasterly blow, the whole convoy went aground on a group of reefs to the north of Townsville. Although they were afloat aft, they were securely aground for'ard and it took nearly three weeks to kedge them all free.

This incident is the origin, not only of the name of the Slashers Group of reefs but also of Kelso Reef, Arab Reef, Hopkinson Reef and John Brewer Reef.

POLYP



'Polyp' is a book for children which has been published by GBRMPA as part of its contribution to International Youth Year. Its publication is the result of the efforts of many dedicated and talented people.

The story was prepared as part of an educational program linked to the new marine exhibition at the West Australian Museum in 1984, and involved a large number of primary school children in a project to illustrate the theme.

The author, Geraldine Carlin, has produced a delightful story which also provides factual information on the life cycle of the coral polyp. The excellent illustrations add a special

appeal to the book and are testimony to the artistic skills of the many school children involved in the project.

Single copies of the book can be obtained on request from the GBRMPA office.





Research

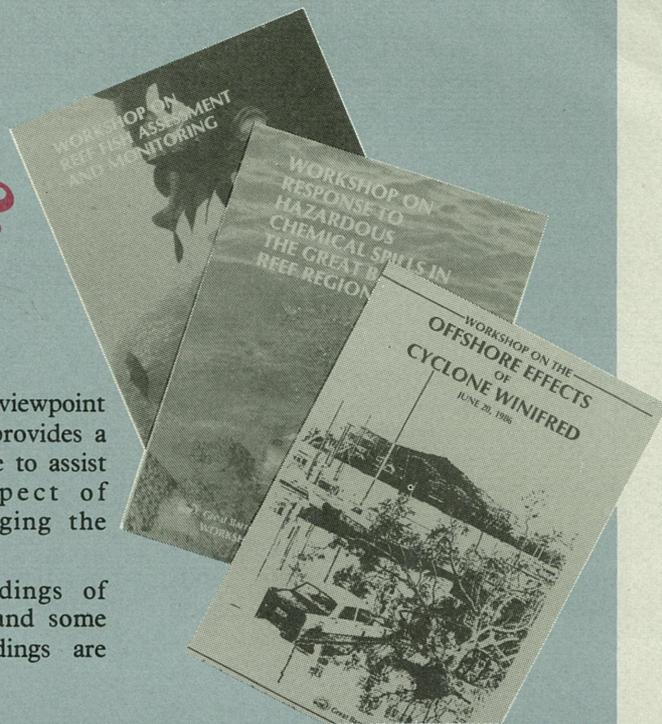
WHY WORKSHOPS?

From time-to-time GBRMPA holds workshops about a particular scientific or management problem. These workshops bring together groups of people with different expert knowledge of the problem under consideration.

The exchange of ideas and information that takes place at workshops is often of benefit to the

experts themselves. From the viewpoint of GBRMPA a workshop provides a pool of advice and expertise to assist with a particular aspect of understanding and managing the Marine Park.

Sometimes the proceedings of workshops are published and some recently published proceedings are described on these pages.



Contamination in waters of the Great Barrier Reef

In May, 1984, the Authority sponsored a one day workshop at Griffith University on contaminants in waters of the Great Barrier Reef. The report of the workshop has recently been published.

The workshop focussed on the three broad contaminant groups of heavy metals, polychlorinated biphenyls (PCBs), other organochlorines and hydrocarbons.

Workshop participants noted that measured levels of substances within

each contaminant group do not pose an immediate threat to human health, individual organisms or the GBR system as a whole. This finding was made subject to the recognition that only limited sampling has been undertaken in waters of the Great Barrier Reef.

Measured levels of most contaminants within the reef waters proper are generally close to the lower limits of detection, although in some adjacent coastal waters (particularly harbours),

concentrations indicative of low to moderate pollution levels equivalent to those found elsewhere in Australia and overseas, have been recorded.

From the workshop, a number of proposals for consideration by the Authority has been derived. These include both short and long term actions, although it was noted that no priority response is required by the Authority in view of the generally low degree of threat posed by the contaminants considered at the workshop.

Response to hazardous chemical spills in the Great Barrier Reef

In August, 1984, the Authority organised a one day workshop in Townsville on the subject of response to hazardous chemical spills in the Great Barrier Reef Region.

The report of the workshop has recently been published and planning is underway to implement its major conclusions. Principal conclusions of the workshop included:

1. There is a need to establish a scientific response capability for spills of hazardous materials (including oil) in the Great Barrier Reef Region.

2. Any response capability which is developed should be for all hazardous materials, not just oil.

3. In responding to hazardous chemical spills in the Great Barrier Reef Region — three elements of the response need consideration:

- combat of spill;
- co-ordination between combat and assessment teams;
- environmental assessment.

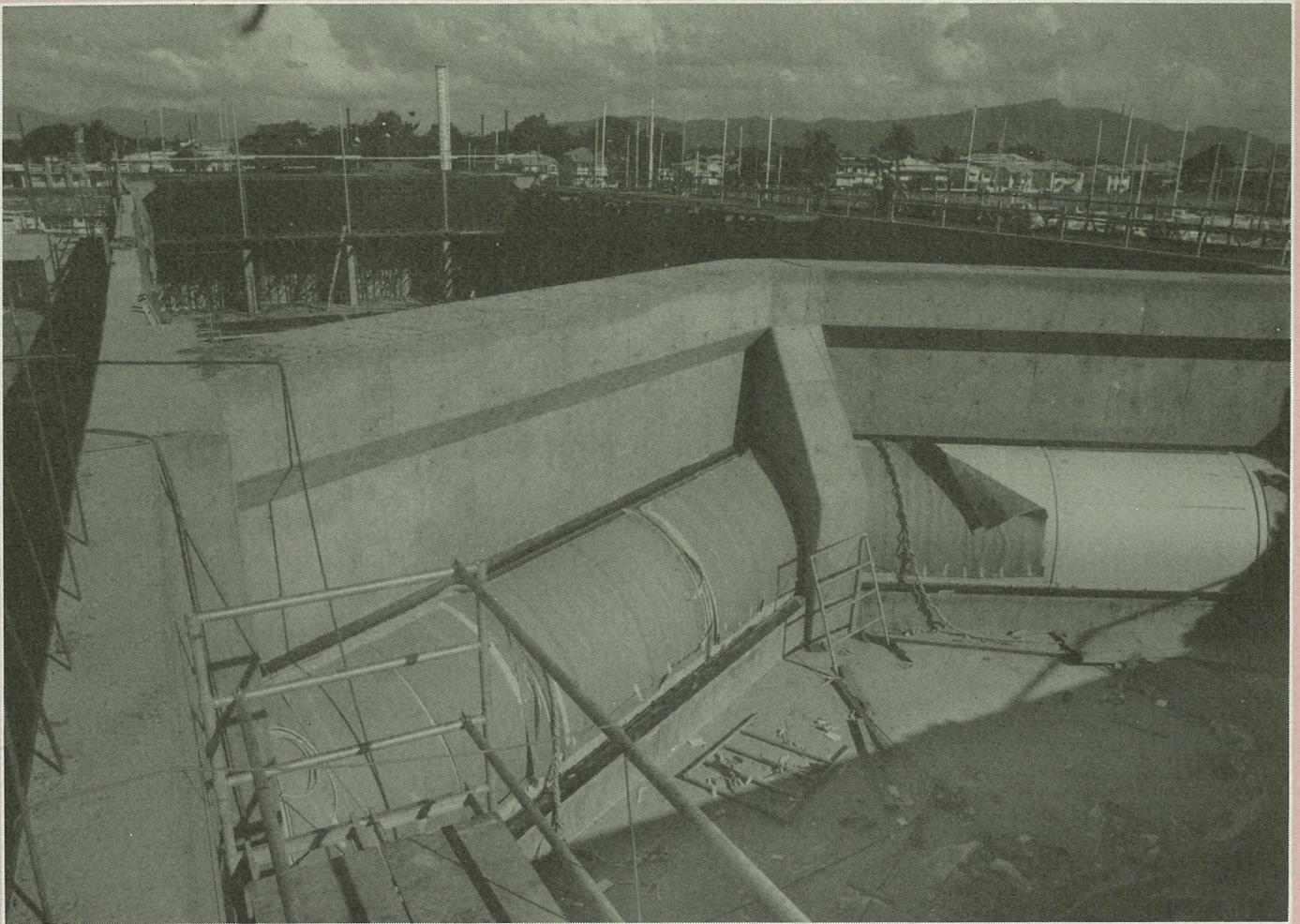
4. There is need for development of models to enable spill trajectory, diffusion and dispersion to be predicted.

5. There is a need to collect and collate information on the:

- nature of hazardous materials;
- volumes of hazardous cargoes;
- degree of risk and hazard profiles of cargoes being carried through the Great Barrier Reef Region.

6. There may be a need for better control of shipping through the Great Barrier Reef Region and aiming efforts to prevent spillage.

Copies of these workshop proceedings can be obtained from the Research and Monitoring Section of GBRMPA.



Construction of the Great Barrier Reef Wonderland complex in Townsville is progressing rapidly with the main aquarium tank almost completed. Specially treated concrete has been used to build the huge 50 x 17 metre tank which is 5m deep. It is the main feature of the complex and will contain a living coral reef.

Six large acrylic windows, several centimetres thick, have been installed in the tank walls allowing visitors to closely observe a coral community. Similar curved windows have been installed along the 17 metre walk-through tunnel (foreground) which divides the predator tank from the coral reef tank. The Wonderland complex is planned to open in July 1987.

OFFSHORE EFFECTS OF CYCLONE WINIFRED

On June 20th, a workshop on the offshore effects of cyclone 'Winifred' was held at the Townsville International Hotel. The workshop was organised and sponsored by the Great Barrier Reef Marine Park Authority.

Participants included representatives of government, industry, academic and private organisations. The workshop objectives were defined by the Authority as:

1. to review what was learned from studies of offshore effects of 'Winifred'; and

2. to review the significance of those findings in the context of our understanding and management of the Great Barrier Reef Region.

In opening the workshop, the Chairman of the Authority, Mr. Graeme Kelleher noted that 'Winifred' was a significant event in a number of respects, one of which was that the offshore effects of 'Winifred' had been studied in more detail than any other Australian cyclone.

The morning session was devoted largely to reports by researchers who had

participated in what were often 'before' and 'after' surveys of the impacted area. A period was also devoted to reports of individual experiences during the cyclone.

The afternoon session involved participants discussing ecological and socio-economic aspects of 'Winifred' in small group sessions. It is proposed to produce a report of the workshop proceedings in the near future. For further information, contact Mr. Ian Dutton on (077) 81 8811.





Research

SEAGRASSES

AND THE GREAT BARRIER REEF

by Janet Lanyon,
Department of Zoology James Cook & Monash Universities



Scientists, management agencies and the fishing industry are looking at seagrass meadows of the Great Barrier Reef with a new interest. This development follows recent surveys where seagrasses have been found in a substantial part of the inshore Great Barrier Reef region, fringing several areas of mainland Queensland and inshore islands. More importantly, there is evidence that seagrass meadows play a vital role in maintaining several major fisheries.

There are 14 species of tropical seagrasses likely to be encountered in waters of the Great Barrier Reef. The nature of seagrass communities is variable; species composition and such features as leaf height, density and area constitute the basic physical character of a meadow. Such structural characteristics are thought to determine the animals found within meadows.

As highly productive systems, seagrass beds support a rich and diverse fauna and flora. Since they are often found in relatively sheltered areas and further help to slow water movement,

stabilize the substrate and accumulate nutrients, they are particularly important as breeding and nursery areas for a number of invertebrate and fish species. Fishes incorporating a juvenile phase spent in seagrass meadows include not only inshore species but possibly a number of reef fishes.

Certainly of greater economic significance is the role of the seagrass meadow in the life histories of several commercial prawn species (Penaeidae). Survey work and current research indicate that juvenile prawns may be directly dependent on the seagrass meadow. Surprisingly, it appears that only a few seagrass areas along the tropical coastline (by virtue of their structure) satisfy the criteria of potentially important prawn nursery grounds. Any factors which have the ability to reduce the size or carrying capacity of these meadows would effectively reduce the number of recruits into the prawn populations. Ironically, the prawn trawlers themselves have the potential to threaten seagrasses in the Great Barrier Reef Region. Trawling too

close to shore in these seagrass areas would tend to plough up the meadows, reducing them to bare, muddy tracts. If large areas of seagrasses were damaged in such a manner, regeneration is likely to be very slow, and repercussions on the prawn industry could be serious. However, to date such destruction has not been a problem.

Seagrass meadows also figure highly in the life history of the dugong since several species of seagrass constitute the animal's primary food source. The largest aggregations of dugongs to be observed in Great Barrier Reef waters have invariably been associated with major inshore seagrass meadows.

However, during recent aerial surveys in the Far Northern Section of the Marine Park, dugongs (which are generally thought of as a strictly inshore species) have also been frequently sighted up to 55km offshore, particularly over the reefs in the northern part of and north of, Princess Charlotte Bay. Aerial observations and preliminary ground-truthing by the Authority in December 1983 confirm that these offshore reefs



support significant seagrass communities. These reefs are also the sites of large congregations of the green turtle, *Chelonia mydas*, a grazer which frequently supplements its algal diet with seagrass.

Since seagrass areas can be influential on, not only commercial fisheries, but also on traditional fishing and on the survival of dependent species such as the dugong, it is vital that they be sensibly monitored and protected.

Recognition of the important seagrass meadows within the Great Barrier Reef Marine Park is of high priority so that these areas can be allocated a degree of

Left: When dugongs feed on the smaller seagrass species, they dig up the whole plant, leaving serpentine trails through the seagrass meadow.

Photo - Rows Bay, Townsville.

Opposite page: Dense, sub-tidal seagrass meadow.

Photo — courtesy Ian Poiner.

protection in accordance with their value. In the Cairns Section of the Marine Park some of the major seagrass beds, which are important dugong and prawn breeding areas, have been included in zones which do not allow the passage of fishing vessels likely to cause them damage. The location of seagrass beds is being taken into account in the development of zoning plans for other Sections of the Marine Park. 

NEW GBRMPA PUBLICATION

Guide to the Identification of Seagrasses in the Great Barrier Reef Region.

by Janet Lanyon

GBRMPA

SPECIAL PUBLICATION

Series (3), 1986

FISHING EXPOSÉ

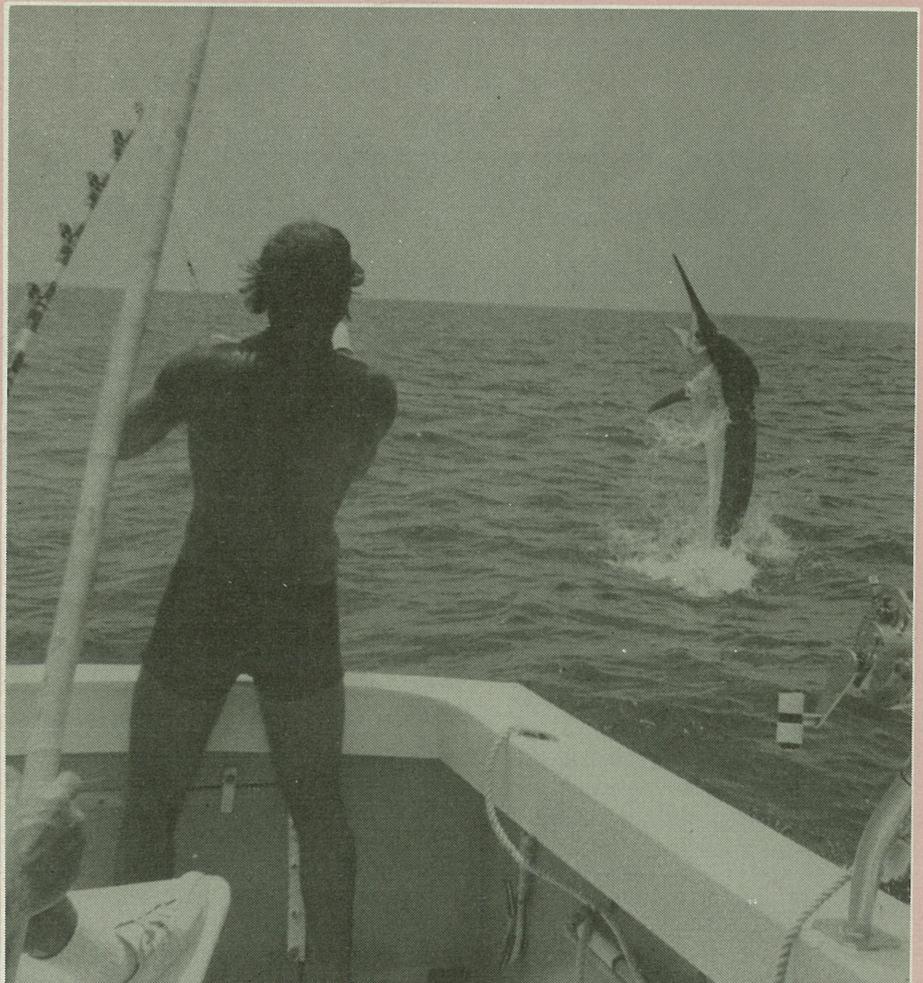
The weekend 17th/18th May saw the largest single gathering of recreational anglers in the history of the sport in Townsville.

The Townsville Recreational Fishing Exposé, sponsored by Lounds Pro Tackle Shop with assistance from the Great Barrier Reef Marine Park Authority saw some of the best known names in recreational angling divulge 'the secrets of the trade.'

The Exposé was divided into three sessions under the headings of Estuary, Reef, and Blue Water, and included a film evening on Saturday night.

The films were the premiere showing of Malcolm Florence's new film photographed at Princess Charlotte Bay and the Ribbon Reefs, and Laurie Woodbridge's new film titled 'Fishing Barramundi'.

The Authority's involvement with the Exposé provided an opportunity for Authority staff to speak to a large audience of Marine Park users. Ideas about the management of recreational fishing were exchanged and much discussion and interest about Marine Park issues was generated in the audience.





Park Management

POLICING THE PARK

by Terry Walker, Queensland National Parks and Wildlife Service

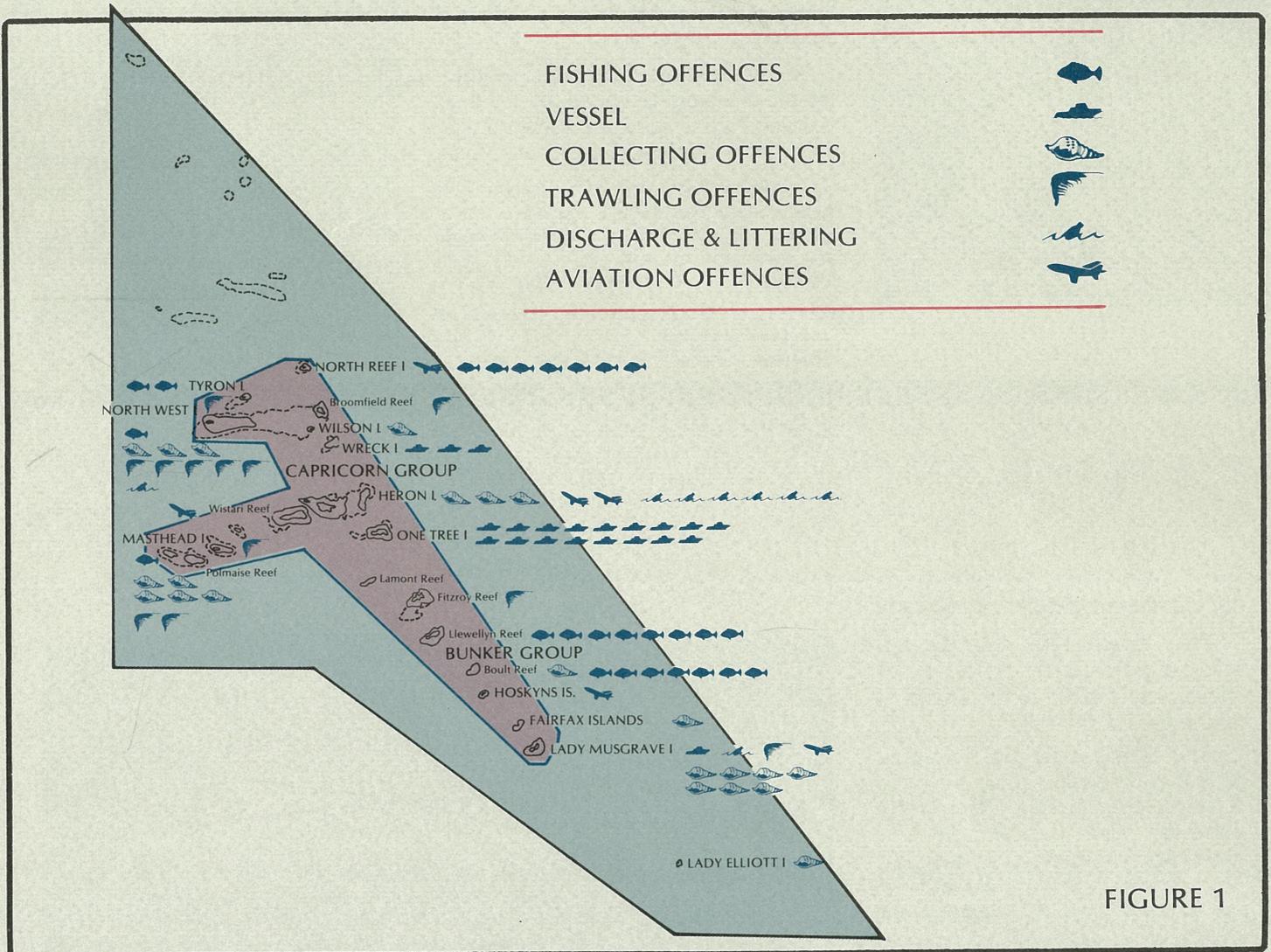


FIGURE 1

Enforcement of the Great Barrier Reef Marine Park Act is one of the day-to-day management objectives of the Maritime Estate Management Branch of Queensland National Parks and Wildlife Service.

The Service carries out day-to-day management of the Great Barrier Reef Marine Park on behalf of the Great Barrier Reef Marine Park Authority. Although education of users is the primary objective and the great majority of users of the Reef appear to accept and comply with the provisions of the Act, it is necessary to maintain an effective surveillance and law enforcement programme in order to deter a minority from illegal activities.

Law enforcement is complicated by the difficulty of ensuring that visitors are

adequately informed of the existence and rules of the Marine Park. In a mainland park there are usually only one or two access roads. Informative roadside signs and information centres are visible to all visitors. This is not often possible in a marine park, particularly if it covers a large area and vessels may enter from any direction.

The first Section of the Great Barrier Reef Marine Park, the Capricornia Section, was declared in July 1981 and in the three years following this declaration a low key approach was taken to law enforcement to allow the public to become familiar with the Park. Since 1984 a progressively tougher approach to law enforcement has been taken in Capricornia and this is reflected in the infringement records for the past two years.

The numbers and types of infringements detected depend among other things on the program of park surveillance, the experience of field officers and the reporting policy, all of which are still evolving. From July 1984 to June 1986 there were 106 apparent offences against the Great Barrier Reef Marine Park Act recorded in Capricornia. Marine Park officers on aerial surveillance flights detected 38% of offences, 8% were detected by Federal Sea Surveillance Centre flights, 48% were detected by Marine Park officers on vessel and island patrols, and 9% were reported by members of the public (3% of offences were detected independently from more than one source). Surveillance flights have the advantage of rapidly searching the whole Park for offences involving vessels (eg. fishing in closed areas)

however they are less effective in detecting offences such as shell collecting or littering.

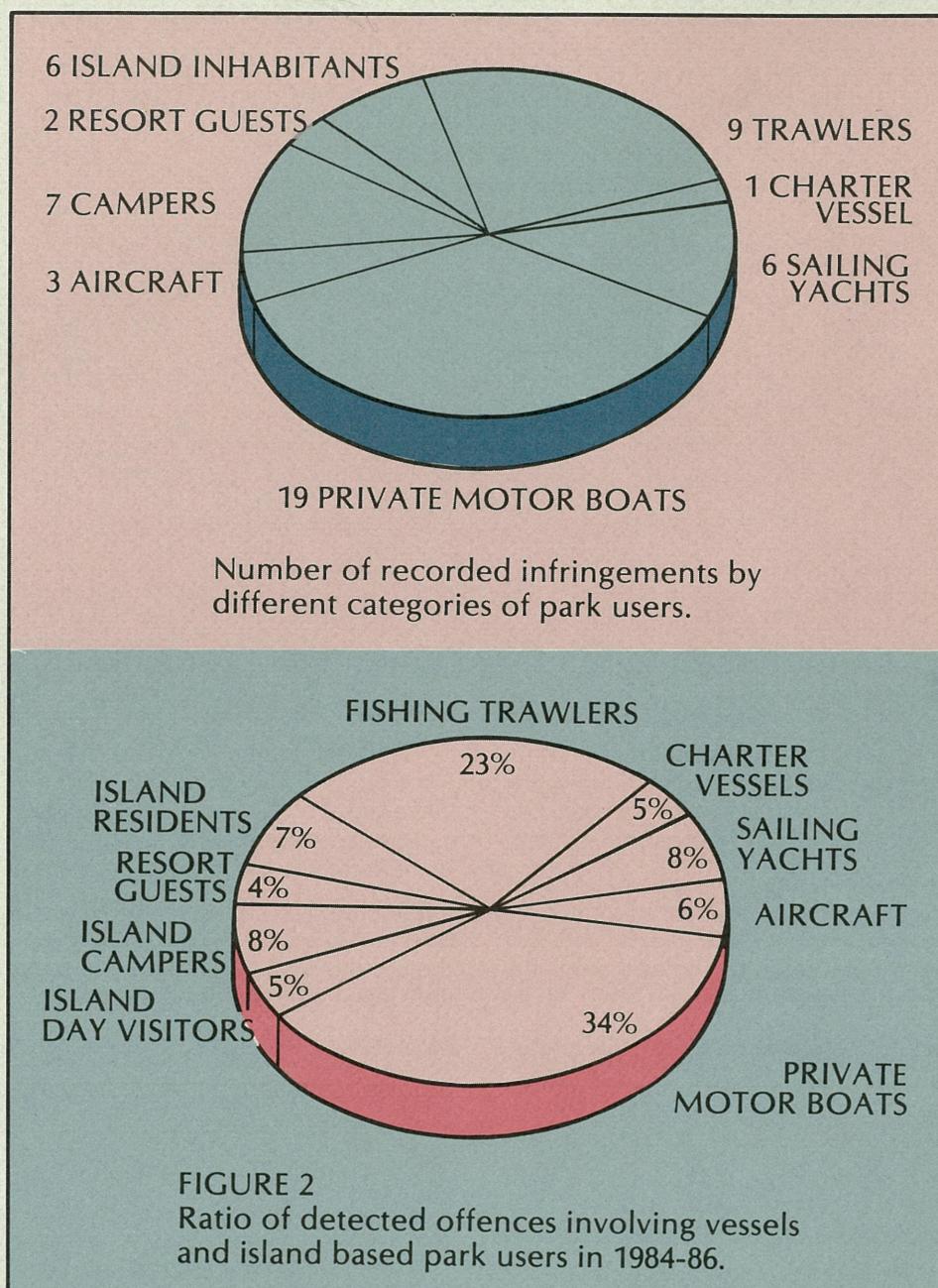
The location and type of each offence recorded during 1984-86 is illustrated in Figure 1. Offences have been grouped into six categories as follows:

1. Illegal fishing (33% of offences). These were mostly cases of people line fishing in no-fishing zones.
2. Vessels in restricted-entry zones (20% of offences). These are the Preservation Zone and Scientific Research Zone.
3. Taking of marine products (20% of offences). Shell collecting was involved in most cases.
4. Trawl nets in the water in the General Use 'B' Zone (13% of offences).
5. Discharge of waste or littering (8% of offences).
6. Aviation offences (6% of offences).

The large General Use 'B' Zone was the zone with the highest number of offences recorded (39%), particularly at reefs with good anchorages and camping islands (Lady Musgrave, North West and Masthead Reefs). The most common infringements were entry of vessels (without permits) to the Scientific Research Zone at One Tree Reef (16% of offences) and fishing in the Marine National Park 'B' Zone at Llewellyn Reef (16% of offences).

The numbers of recorded offences committed by different categories of Park users are shown in Figure 2. The distribution is not truly representative because some categories of offences and offenders are more readily detected than others. For example, entry of vessels to the Scientific Research Zone is easier to detect than collection of shells by guests at resorts.

In two out of every three cases it was possible to obtain the address or to identify the origin of offenders. Of those identified 57% were local residents in adjacent coastal towns or on islands within the Capricornia Section and 37% were from other parts of Queensland. There were only two identified offenders from interstate and two from overseas.



The primary response to infringements during 1984-86 was to counsel and warn offenders. Many claimed to be unaware of the Marine Park legislation. Park officers counselled 40% of offenders face-to-face in the park and 6% by phone at their addresses. Warning letters were sent in 36% of cases and prosecution was investigated in 8% of cases. In 21% of cases follow-up action was not possible because vessels could not be accurately identified from the air or because offenders had left the scene. At the time of writing three offenders have been

convicted and fined \$800 to \$1,000 for fishing in a Replenishment Area or Marine National Park 'B' Zone and several other cases are awaiting trial.

Obviously it is sometimes necessary to undertake actions such as prosecutions to ensure compliance with the regulations. However, both Q.NPWS and GBRMPA remain committed to achieving management of the Marine Park primarily through community understanding and acceptance.

THE OLD BOND STORE CAIRNS



In 1984 the Authority became aware that the Old Bond Store adjoining the Customs House in Cairns was available for use by day-to-day management staff.

The building, though in need of repair, was sound and ideally located for contact between Park ranger staff and people on their way to and from the Great Barrier Reef Marine Park.

Following negotiations between the Authority, the Queensland National Parks and Wildlife Service and the other government departments involved, the Bond Store was leased to the Authority.

The building was refurbished and fitted out to provide a display and public contact area and office space for ranger staff working in the Great Barrier Reef

Marine Park, on the mainland and with Wildlife.

The Bond Store is now fully operational and open to assist Park visitors with information and advice.

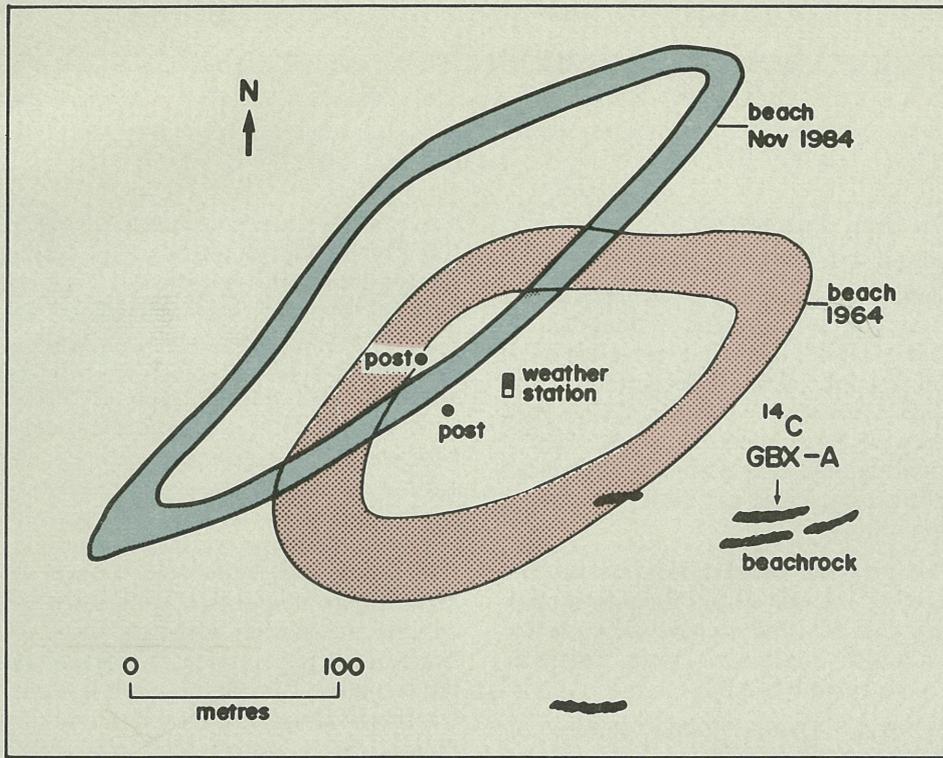


MOBILITY OF GANNET CAY

by P.G. Flood,
Senior Lecturer in Geology,
University of New England,
Armidale, N.S.W.

People are often surprised to return to a coral cay following an absence of a few years and find that it has moved. They wonder if their memory is at fault and find it hard to believe that something as solid seeming as an island with shrubs and grasses can shift from place to place. However this can happen and sometimes it is possible to record the movement. Gannet Cay provides such an opportunity.





Gannet Cay is situated to leeward on a small oval shaped platform reef in the southeastern sector of the Swain Reefs, southern Great Barrier Reef. It is a small vegetated cay rising about 3m above the level of the reef flat. The present vegetation is low (less than 0.5m high) and consists of a sparse cover of grasses and small shrubs such as **Coronopus**, **Cakile** and **Boerhavia**.

Changes in the shape of the Cay and its position on the reef flat may be monitored starting with the first black and white aerial photographs taken in August, 1964 (Division of National Mapping Aerial Photography). The Commonwealth Bureau of Meteorology installed an automatic weather station near the centre of the Cay in July, 1972. A new base to the weather station had to be built in June, 1979 because the structure was being eroded. The Cay had moved in the intervening period, most likely in response to erosion caused by Cyclone Pam (February, 1974) and Cyclone David (January, 1976). The latter cyclone passed on an E-W track just north of the Cay.

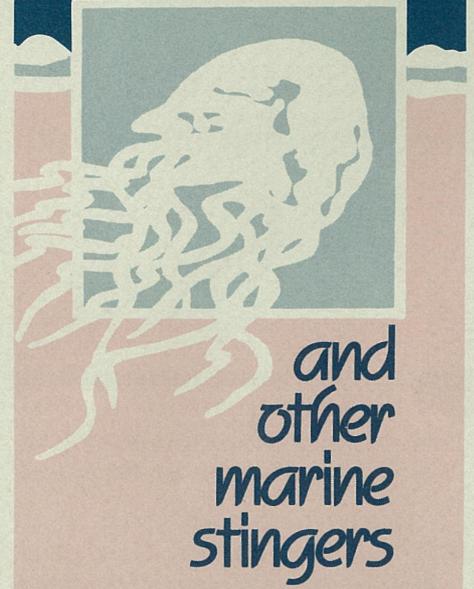
The Cay was influenced by another major cyclone in March, 1980 (Cyclone Simon) and following further erosion the Cay migrated further towards the leeward side of the reef top. During visits to the Cay in July, 1980, Hal Heatwole noted on sketches that the weather station was now exposed on the beach. Further erosion and leeward movement occurred during the next two years and when I visited the Cay in July, 1983, the weather station was now on the reef flat and isolated from the Cay (see photo). The leeward movement has continued as

evidenced in an Australian Survey Office photograph and RAAF photography taken in November, 1984 and confirmed during a field inspection in July, 1985.

In addition to these clearly documented changes in the position of the Cay since 1964, there is evidence of much earlier positions of the Cay towards the centre of the reef top. Four distinct outcrops of beachrock, left isolated when the Cay moved, can be observed. A sample of **Tridacna maxima** clam shell embedded in the beachrock gave a Carbon -14 age of about 1510 years ago, (about 1060 years Before Present when corrected for environmental effects). This age gives a maximum age for the formation of this beachrock. Obviously the island has been around for a considerable time.

The Cay's rate of migration towards the leeward side of the reef appears to have accelerated during the past 20 years. If the same rate and direction of motion continues the Cay could be washed over the reef edge in an intense cyclone. The degree of mobility exhibited by Gannet Cay is reflected in the behavior of several other small cays within the Swain Reefs. The instability of these small cays has implications for management of cays within the Great Barrier Reef Marine Park in relation to the building and siting of structures.

beware the box jellyfish



and other marine stingers

The Queensland Department of Health has produced this free brochure containing valuable and interesting information about marine stingers. The brochure includes name, descriptions and sting characteristics for the more common stinging jellyfish as well as important first aid information reproduced below.

- Restrain the victim if he is distraught.
- Stay with the victim, even if he is conscious, and call for trained assistance and antivenom.
- If tentacles are visible on the victim's back, pour vinegar over them.
- Lie victim on his back and pour vinegar over other sting areas.
- If breathing stops, start expired air resuscitation
15 times a minute for an adult
20 times a minute for a child.
- If the heart stops, start cardiopulmonary resuscitation (expired air resuscitation and external cardiac compression) only if you have been trained in this technique.
- Do not stop resuscitation until either trained assistance arrives or the victim recovers.
- Do not wash or rub the sting area — do not apply any substance but vinegar.
- Do not move the victim unless under instruction from trained medical or first aid personnel or until his condition has been satisfactory for 10 minutes.

BOOK REVIEWS

Proceedings of the Fifth International Coral Reef Congress Tahiti

27 May — 1 June, 1985

Published by Museum Antenne - Ephé, Moorea (French Polynesia), 1985 6 vols.

The International Coral Reef Symposia are some of the major meeting points for coral reef scientists. This, the 5th, International Congress was held in Tahiti and the Proceedings reflect the wide variety of coral reef research taking place throughout the world.

An innovation in these Proceedings is that Volume 1 consists of introductory information about French Polynesian reefs and islands. After a general introductory chapter, there are detailed field guides to a number of islands and atolls. They were obviously intended for the assistance of those attending the Congress but undoubtedly will be used as a valuable compendium of information on this area.

Volume 2 was prepared before the Congress and contains the abstracts submitted by intended contributors. Volume 3 starts with a formal account of the Congress including such information as lists of participants and the texts of the closing and opening speeches.

The substantial scientific component of the work is in the second half of Volume 3 and in Volumes 4 to 6. Here are the texts of the papers presented at the Symposia, Seminars and general sessions of the Congress. It is impossible in a single review to cover the contents of these volumes. Some of the broad subject areas covered include herbivore-plant interactions on coral reefs, evolutionary ecology of reef organisms, ciguatera, sea-level changes, hurricane effects and reef metabolism.

The high price of this publication (\$US200) will probably restrict its purchase to libraries but it should be a valuable reference source for a variety of topics.

The Next Symposium

At the 5th International Coral Reef meeting a proposal was made by Australia nominating James Cook University of North Queensland as host institute for the 6th International Coral Reef Symposium. This proposal was accepted by a meeting of the IABO (International Association of Biological Oceanographers) Coral Reef Committee.

The proposal offered to convene the meeting one year earlier than its normal four-year schedule to coincide with the Australian Bicentennial year. This was also accepted by IABO.

Dr. Peter Davies of the Bureau of Mineral Resources who put forward the proposal on behalf of Australia was elected as the next Chairman of the IABO Committee and as the Convenor for the 1988 Symposium. Since that time Dr. Davies has formed an Executive Committee to organise the Symposium and has also established an Advisory Committee with representatives from Australian and Queensland Governments, universities and other interested bodies. The Advisory Committee is chaired by Dr. K. Back, A.O., until recently Vice Chancellor of the James Cook University.

Dr. Don Kinsey, Executive Officer of the Great Barrier Reef Marine Park Authority, has undertaken to be Convenor of the Technical Program for this meeting.

Changes in the Programs

In organising the 5th International meeting in Tahiti, the French introduced a number of innovations to the program. These were primarily a series of sessions which they called 'Symposia' and which were essentially 'theme' sessions. They also introduced a number of sessions referred to as 'seminars' which were essentially major plenary reviews followed by discussion periods. Nevertheless, the Tahiti meeting still tended principally to emphasise conventional disciplinary segregation among sciences and in this sense did not fully satisfy many participants in that there is now substantial interest in achieving fully cross-disciplinary sessions to discuss new advances in coral reef science.

The intention for the 6th Symposium is that we will take advantage of both the

seminar and symposium concepts which the French introduced but the whole Symposium will be organised along strictly thematic lines in which all sessions will be, as far as possible, multi-disciplinary and strongly problem-oriented. Each specific session or 'Mini-Symposium' will have a specific theme title and will incorporate elements of science and management relevance. Each session will also incorporate keynote addresses, reviews of the present state of scientific knowledge, a series of invited papers specifically intended to address the session theme, a series of contributed papers seen as relevant to the themes and a series of poster sessions which will be specifically relevant to the theme. It is hoped that this fully integrated approach will make the 6th International meeting both truly innovative and an outstanding success.

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.

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