



# Reeflections

Newsletter of the Great Barrier Reef Marine Park Authority  
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## GO-AHEAD FOR NEW PARK AREA

Planning is underway for the second section of the Great Barrier Reef Marine Park to be established in 36,000 square kilometres of the Reef Region off Cairns. Public comment on the proposal is being sought this month.

The Great Barrier Reef Ministerial Council at its meeting on 28 March discussed the possibility of further sections of the park being proposed and agreed that the Great Barrier Reef Marine Park Authority should continue with work on the proposed Cairns Section.

The Council further requested the Authority to seek additional comment from the public on matters relating to the Section.

Advertisements have appeared inviting public comment and special displays manned by Authority staff were arranged for coastal centres adjacent to the proposed area.

The Minister for Science and the Environment, Mr. David Thomson, said the area under consideration extended from Cook's Passage in the north to south of Dunk Island. The 36,000 square kilometres involved is three times the size of the first park area, the Capricornia Section, which covers approximately 12,000 square kilometres.

The Minister said that when the Cairns Section was declared, a total of about 500 kilometres of the 2,000 kilometres of the Great Barrier Reef would be part of the marine park.

### ZONING PLANS

Mr. Thomson said zoning plans for the Cairns Section would be made as simple as possible and regulations minimised. The plan would provide zones allowing reasonable use of the area and any unnecessary restrictions or changes to established uses would be avoided.

The purpose of zoning, the Minister said, was to eliminate incompatible activities while ensuring continued public usage and enjoyment of the Reef.

When the public comment period closes, the Great Barrier Reef Marine Park Authority will prepare a report on the proposed Cairns Section for

consideration by the Ministerial Council detailing the biological, physical and economic features of the area.

The Ministerial Council at its March meeting expressed the view that the formulation of policy matters relating to marine parks and the development of zoning plans and regulations will be approved by the Council. Further, the Council will be the point of appeal and approval on implementation of the zoning plans, and major issues which may arise as a result of such implementation.

The Ministerial Council consists of two Ministers from each of the Commonwealth and Queensland Governments.

### In Brief...

#### ● Crown-of-Thorns

A special allocation of \$10,000 has been made jointly by the Commonwealth and Queensland Governments to enable the Queensland Fisheries Service to undertake preliminary eradication work on the Crown-of-Thorns starfish at the Green Island reefs.

#### ● Chairman

Professor K. P. Stark was elected Chairman of the Great Barrier Reef Consultative Committee at its tenth meeting in November.

#### ● Survey

The Great Barrier Reef Marine Park Authority is undertaking a survey of reefs between Innisfail and Lizard Island, determining reef and coral conditions and surveying for the presence of Crown-of-Thorns starfish.



GBRMPA members and staff met with officials of the tourism industry in Townsville in March. Also attending were the Commonwealth Minister for Science and the Environment, Mr. Thomson (top left) and the Queensland Minister for Maritime Services and Tourism Mr. Hooper (top right).

# The State of Reef Fishing

Studies of fish stocks and catch results have brought to light significant information about the state of recreational fishing on the Great Barrier Reef. According to Dr Wendy Craik who conducted the research, there is reason for concern in certain areas.

Dr Craik, a fish biologist with the Great Barrier Reef Marine Park Authority, says many amateur fishermen are finding it necessary to travel greater distances for a rewarding catch, and in some areas catch sizes have declined dramatically.

"There are indications that certain reefs have not recovered from the removal of big fish more than 20 years ago", Dr Craik said. "By contrast, reefs that are now protected have up to ten times more fish and they are much bigger than in the fished areas".

This was the first survey that examined in detail amateur fishing on the Great Barrier Reef. Dr Craik says that the co-operation of recreational fishermen was needed for the research and it was eagerly given. Many are continuing to participate by filling in daily catch records. "I think most fishermen appreciate that it is in their interests to see any threats to fish-stocks being identified so they can adjust their fishing accordingly", she said.

The research was undertaken from several angles including comparing fish in both fished and protected areas using diving survey techniques; analysing the catch records kept by deep sea fishing clubs and charter boat operators; and conducting surveys at coastal boat ramps adjacent to the Capricorn and Bunker Groups at the southern end of the Great Barrier Reef.

## Cairns-Innisfail-Townsville Reefs

Information on amateur fishing at reefs off Cairns, Innisfail and Townsville was obtained by Dr Craik from amateur fishing clubs and charter boat operators.

Comparison of the catch results during the last few years suggests that the average fish size is bigger at reefs off Cairns than at reefs either off Townsville or Innisfail. However, in terms of the number and total weight of fish caught, fishing is better from Townsville.

Where reefs are varying distances from port (e.g. Cairns and Innisfail), there is an improvement in fishing (numbers, weight and average fish size) with distance from the home harbour. This does not occur in the Townsville area where most of the reefs investigated are 70 to 90 km offshore.

The most complete data available over any length of time, so far, is for the Townsville area, and it appears that while fishermen have been catching about the same number of fish over the last 17 years, the fish have been getting smaller. This contrasts with the situation off Innisfail where fishermen have been catching fewer, but on the average larger, fish since 1971.

As far as particular species are concerned, again the most complete and detailed information is from Townsville where it appears that both cod and spangled emperor have been caught at consistently low levels since the early 1960's. Coral trout catches appear to have declined and sweetlip show extremely large fluctuations in catch. There are some quite striking differences among reefs, but overall this trend is generally evident.

## Coral Trout Surveys

Coral trout populations in the Capricorn and Bunker reefs were surveyed using a technique developed at workshops organised by the Authority and attended by fish biologists from State Fisheries, universities and other research institutions. Using this technique, a pair of divers searches the reef slope to a depth of 60 feet, swimming in transects (searching gullies and crevices and outer bommies) perpendicular to the reef crest for the duration of one tank of air (about 30 minutes or 150 metres along the reef crest). With pencil and slate, the divers classify the coral trout they see into length classes. The results give a picture of the size structure of the population in an 'unfished' area and fished areas and an index of the density of trout. In areas where fishing has had an effect, numbers of fish have been found to be lower and there is a higher percentage of smaller fish than in unfished areas.

In surveys in November and February, a total of 55 areas from 13 emergent Capricorn reefs and Bunker reefs were sampled. Because of strong winds (15-30 knots), and the location of anchorages and popular fishing areas, the surveys were restricted to the leeward sides of reefs.

The results showed that in the Heron-Wistari reefs, there is about four to ten times the density of coral trout found at other reefs in the group. In addition the majority of coral trout are 10-20 cm bigger. Spearfishing has been totally prohibited on these reefs and line fishing prohibited in some areas and restricted in the rest.

At the Heron Bommie and on the north side of Heron, areas closed to fishing for at least five years, most fish fall in the 40-60 cm size range and the density index of trout is about 100 or more per hectare.

At the other Capricorn reefs except Masthead, the main size class is 30-40 cm (at Masthead it is fairly evenly divided between 30-40 and 50-60 cm). The Bunker reefs show similar size class distributions to the Capricorn reefs except for Fitzroy and Lamont

## APPOINTMENTS TO AUTHORITY

Appointments have been made to the most senior positions within the Great Barrier Reef Marine Park Authority.

On 22 December, Mr. Graeme Kelleher was appointed as the first Chairman of the Authority, after six months as full-time Acting Chairman. His appointment is for five years.

Dr. Alistair Gilmour has been appointed Executive Officer. Dr. Gilmour joins the Authority from the Victorian Ministry for Conservation where he was Director of the Marine Studies Group. He is a Fellow of the Australian Academy of Technological Sciences, and a Council Member of the Victorian Institute of Marine Science.

Three new senior positions have been created and filled by current officers.

Rod Williams has been made Assistant Executive Officer, Park Management and Information.

Richard Kenchington has been appointed Assistant Executive Officer, Research and Planning.

Simon Woodley is Acting Assistant Executive Officer, Secretariat and Services.

where the main size class is 40-50 cm. The density indexes for trout are similar at the majority of Capricorn and Bunker reefs, less than about 30 trout per hectare. The lowest density index was recorded at North Reef where it measured seven trout per hectare.

While fishing appears to have had a considerable impact on trout in the Capricorn and most of the Bunker reefs it does not suggest that a successful day's fishing is no longer possible in the Capricorn-Bunker area. Results from deep sea fishing clubs and charter boat operators show catches (number of fish per person per day and mean fish size) have not changed significantly since 1957. Catch rates remain at about 15 fish per person per day, the average fish size is about 1 kg, which is however lower than anywhere else on the Reef (e.g. 3 kg at reefs off Cairns).

The Capricorn Group research indicated that the distance of the reef from the coast made no difference to the catch. It was virtually the same at all reefs, including those closest to the mainland.

## ● Mooring competition

A competition with a prize of \$1000 has been launched by the Great Barrier Reef Marine Park Authority for the design of permanent moorings for boats at selected sites on the Great Barrier Reef. The competition is open to engineering and architecture students.

# DISPLAYS FOR ZONING PLAN

An extensive program of public involvement, with special display and distribution centres throughout Australia, was undertaken in connection with the release of the zoning plan for the Great Barrier Reef Marine Park Capricornia Section.

## FEATURES OF PLAN

The zoning plan for the Capricornia Section is based on the results of research by the Great Barrier Reef Marine Park Authority and other organisations, and incorporates views and opinions sought from expert groups, consultants, the Great Barrier Reef Consultative Committee and the public. The five zones of the Section are:

**General Use 'A' Zone** — provides opportunities for the continuation of established activities and uses including shipping and trawling.

**General Use 'B' Zone** — provides for the continuation of established uses with protection for reefs from the potential effects of trawling and commercial shipping.

**Marine National Park Zone** — provides for unrestricted public access but fishing and collecting, with the exception of certain forms of recreational line fishing are not permitted. Like a traditional terrestrial national park, it will allow visitors to view reef areas and marine life which remain relatively undisturbed by human activity.

**Scientific Research Zone** — provides for an area where manipulative scientific research may be carried out free from other activities and will allow for a protected area outside the Preservation and Marine National Park Zone.

**Preservation Zone** — provides areas which are protected in their natural state undisturbed by man except for the purposes of observational scientific research.

Within certain zones, areas of restricted activity are proposed for management and conservation purposes as described in the zoning plan. These are:

**Replenishment Areas** which are closed from time to time to fishing and collecting for a specified period to allow for the recovery of fish and any other resource stocks.

**Seasonal Closure Areas** where all activities are restricted on a seasonal basis to protect from human intrusion important bird and turtle nesting sites.

**Reef Appreciation Areas** which are small areas provided on reefs subject to heavy usage. Fishing and collecting are not allowed, so that the public can observe and appreciate relatively undisturbed marine life.

**Reef Walking Areas** which are small areas subject to heavy usage in which educational reef walking trails are established.

The Great Barrier Reef Marine Park Authority set up 16 display centres at major Queensland coastal centres and all capital cities for the public comment period. Many of them were manned by officers of the Authority to assist the public in the preparation of submissions.

A specially-prepared document "Understanding the Zoning Plan" was released with the draft plan.

Assistance was given in the distribution of the documents and display of the zoning plan by the Queensland Tourist and Travel Corporation and regional offices of the Australian Tourist Industry Association, as well as other local, State and Commonwealth agencies.

Several hundred people visited the display centres during the first part of the public review period which began on 9 April.

### Closing Date

Closing date for public submissions on the plan, was fixed for 6 June, and the period for public involvement of more than eight weeks doubled that required under the Great Barrier Reef Marine Park Act.

The extra time was allowed because of the widespread interest in the zoning proposals and the fact that Capricornia is the first of the Great Barrier Reef Marine Park and is a most heavily used area of the Great Barrier Reef.

Public submissions on the zoning plan are being considered by the Great Barrier Reef Marine Park Authority after 6 June, and suggestions incorporated where appropriate. The plan accompanied by all relevant comments will then be submitted to the Minister for Science and the Environment and the Great Barrier Reef Ministerial Council before being tabled in the Commonwealth Parliament.

The zoning plan is the basis for the regulation of activities in the park so that these activities are compatible with each other and with the need to conserve the natural qualities of the Great Barrier Reef. While covering the marine environment within the park boundaries, the plan does not apply to islands in the Section that are part of Queensland and are not owned by the Commonwealth.

The success of the marine park concept depends considerably on user co-operation and public awareness of the need for management through zoning. However, certain regulations will be required, and these will be developed when the zoning plan is approved.

## AID FOR TOURIST INFO. SERVICES

The provision of visitor aids and educational facilities for tourists to the Great Barrier Reef is being investigated this year under a \$50,000 special Commonwealth allocation through the Department of Industry and Commerce.

The project will be developed initially in the Whitsunday area and will include examination of possible requirements for visual materials, publications, diving and reef exploring trails.

The Great Barrier Reef Marine Park Authority is administering the project and engaging private consultants for the major research aspects. Current information and educational facilities available to tourists on the Barrier Reef, and methods used to inform tourists in other parts of Australia and overseas will be studied.

A specialist workshop of Commonwealth and Queensland government and private sector tourism agencies will be held in the Whitsunday area in August to plan further action arising from the initial research. Some funds are to be made available to local tourist organisations in the Whitsunday area to further develop information programs.

The project follows recommendations by the House of Representatives Select Committee on Tourism. In its final report in October 1978 the Committee recommended that sufficient funds should be made available for the Authority to develop reef visitor information facilities at the major destination areas adjacent to the Reef.

### Further Study begins

The Authority acknowledges the economic importance of reef tourism to Queensland and is working with the Queensland Tourist and Travel Corporation to assist the growth of tourism. A study is currently underway on the development of the tourist industry servicing the Great Barrier Reef since 1946. The review will provide the Authority and other agencies with information on the various dimensions of the Reef and coastal tourism industry such as employment, institutional and legal factors, and geographical constraints.

The research also involves understanding more about the attitudes of Reef visitors, such as whether the Reef offers as attractive a range of activities and pursuits as coastal and mainland destinations. Researchers will, over an 18 month period, interview tourists at selected sites within the Great Barrier Reef Region to gauge their attitudes to their chosen holiday. This research will aid the Authority in making provision for greater appreciation and enjoyment of the Great Barrier Reef by the public.

## Profile:

# George Coates — fish master

George Coates is one of those colourful characters of the Great Barrier Reef, with a talent that has been internationally acclaimed.

Mr. Coates is a spare-time artist specialising in one area — the drawing of fish.

His reproductions of fish species, meticulously detailing every fin and scale, have been used in many publications to help people's knowledge and understanding of the world beneath the sea. He is entirely self-taught in this form of artistry and his talent and eye for detail have been acknowledged by the Los Angeles Museum which snapped up a complete set of his drawings — 600 in all.

Now in his eighties, Mr. Coates has spent more than half his life studying and drawing fish species. There are few people in Australia, perhaps the world, who have his ability to identify fish types, particularly the many hundreds of tropical varieties. His reputation is so high that fishermen are continually dropping in at his home in Townsville seeking identification of unusual species they have caught.

### Long Hours

Working with an ordinary mapping pen, a selection of fine brushes and colour mixes, and, of course, the dead fish, George Coates can spend up to 20 hours creating a single drawing. He has often continued into the early hours of morning completing a specimen to ensure that the detail and the colours are reproduced exactly.

"Drawing has an advantage over photography" says Mr. Coates. "In most cases when fish are photographed the fish will close his fins just as you push the trigger. Similarly, photographs may not show scales clearly, and in many species the scales vary considerably. In some fish they follow the lateral line along the body. Other fish have their scales going diagonally up the back and stomach. These factors are essential to accurate identification".

Things that the camera may miss are clearly shown by George Coates' drawings.

He first produces a rough outline of the fish in pencil, then incorporates the fins, the scales, and other details. Each part of the fish is drawn in squares to get the proportions right and traced on to drawing paper with the aid of a glass topped box which is lit from underneath. Mr. Coates built the tracing box himself.

He draws every scale of the fish and checks them with the actual fish and his

own reference material to make sure they are all there. "It is probably true that I draw fish to scale by each scale", he muses.

### Determining Age

Mr. Coates can not only identify unusual fish species but can give their age in years or months and state of feeding when caught. Mr. Coates says he establishes age by the scales.

"The scale growth start from a single point. You establish the growth rings radiating from that central point. One dark one, one light one usually represent one year", Mr. Coates says.

There are some traps in determining age however. Some fish put down rings when they spawn or breed. Also, the size of a fish may have little bearing on its age. Food supply and the differing rates of adult growth within species determine size but not age.

The fact that fish fade in colour after landing is one of the problems that Mr. Coates has had to face, particularly in producing full-colour drawings of various species.

Again Mr. Coates has found a solution. "To get an indication of the true colour of a fish after he's dead, you lift up the pectoral fin. That's a pretty good indication of what the body colour was like".

In the fish he catches himself, to retain the colour Mr. Coates washes the fish immediately in very strong salt water, damps it in the same liquid and wraps it in a cloth before freezing.

One fish he prepared this way still had its true colour when he removed it from the freezer 12 months later. But as Mr. Coates points out, the colours can be gone in an hour and this is all the time he has to match them accurately.

### The Secret

Mr. Coates says his retentive memory has helped him to become an expert on fish identification. "In all my



George Coates, and below, an example of his work.

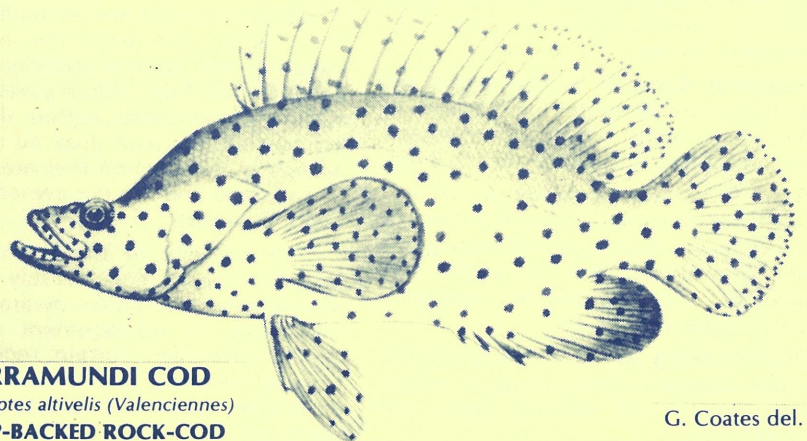
years of fishing I have handled thousands of fish and when I see a fish once I always remember it".

When he first became interested more than 40 years ago, any fish that he couldn't recognise he would draw and send to his friend Tom Marshall. That started a working relationship which culminated 21 years later in the production of the book "Fishes of the Great Barrier Reef and Coastal Queensland Waters". In 1966 came another book by Mr. Marshall and featuring the drawings of George Coates called "Tropical Fishes of the Great Barrier Reef". Both these major works are recognised as authoritative publications on the recognition and identification of fish.

The original plates were sought by the Los Angeles Museum. George says: "They sent a man round one day. He said: 'We'll have those. We'll take the lot, because as far as we know in the modern world there's not another collection like it anywhere'. The Museum decided to build a special display of North Queensland fishes as a result and use my drawings as a basis for it".

Mr. Coates despite his age is still drawing fish even though he doesn't catch them anymore. "I started to go to the Reef when I was 16 nearly 70 years ago. I've fished the Gulf, Cape York and its islands down the coast to Charlotte Bay and all along the Reef to Bowen", he said.

But it was only a hobby. "If I didn't want them for drawing I gave most of them away because I don't like eating fish that much".



### BARRAMUNDI COD

*Cromileptes altivelis* (Valenciennes)

HUMP-BACKED ROCK-COD

G. Coates del.

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