CAPE TRIBULATION FRINGING REEFS AND MONITORING PROGRAM

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The coastline in the vicinity of Cape Tribulation is generally acknowledged as being among the most scenic in Australia. Fringing reefs occur along much of this coastline between the mouth of the Daintree and Bloomfield Rivers (Figures 1 and 2).

As part of the Cairns Section of the Great Barrier Reef Marine Park, these reefs were zoned Marine National Park 'A' and Marine National Park 'B' in 1983 to provide them with some degree' of protection. With these zonings, limited fishing is allowed in MNP'A', but extractive activities are not' permitted in MNP'B'. (Figure 2.)

In late 1984 a new unsealed road linking Cape Tribulation and Bloomfield was opened to the public. The road was the subject'of considerable controversy between,conservation groups opposed - to its construction and local and State governments equally determined to see the road built (Davis, 1985). One of the major concerns about the new road was its potential to adversely affect the adjacent fringing coral reefs through increased sediment run-off, (e.g. see Borschmann, 1985).

Little is known of the geology, geomorphology and ecology of these reefs. This deficiency, combined with the lack of knowledge about the potential effects of increased sediment concentrations on fringing reefs, prompted the initiation of an investigation to provide a sound basis for the determination of possible management needs which might arise from the presence of the road.

To do this, it was decided to establish a research'and monitoring program on the Cape Tribulation reefs. This was done af'ter' detailed consultation with the scientific community and taking into account a range of matters related to cost effectiveness; lack of existing information, integration in the overall monitoring program etc., (for details of the program development see Dutton and Craik, submitted). The final program consisted of two research projects and two monitoring projects.

The research projects are designed to provide information on the sediment regime from the mainland catchments through the, fringing reefs to inshore areas. The monitoring projects are designed to compare characteristics of biological communities (e.g. coral,', fish, coral recruitment) at'a number of sites some of which are subject to sediment run-off from the road. The program will continue until 1988.

The initiation of the work was preceded by a preliminary investigation (Ayling and Ayling, 1985) to enable refinement of the'survey design.

Table 1 summarises the four research and monitoring elements of the program. Preliminary information gained as a result of these studies will be presented in subsequent papers in this workshop by the investigators. As a result of this major research and monitoring initiative, not only should information be provided which will assist in determining appropriate management actions, but a considerably greater understanding of the dynamics of mainland fringing reefs will have been obtained.

REFERENCES

Ayling, A.M. and A.L. Ayling. 1985. A Preliminary Survey of Coastal Reefs in the Cape Tribulation Region, unpub. Report to Great Barrier Reef Marine Park Authority.

Borschmann, G. 1985. Daintree Reefs - Where Rainforest Meets the Reef, Weldon and Australian Conservation Foundation, Melbourne.

Davis, J. 1985. Rural Local Government Authorities as Environmental Managers: A Case Study of the Douglas Shire Councrl and its Management Role in the Cape Tribulation National Park, Tropical Rainforests 13 : pp 9

Dutton, I.M.and G.J.S. Craik. submitted. Assessing the effects of sediment discharge on fringing coral reefs. Coastal Zone Management Journal.

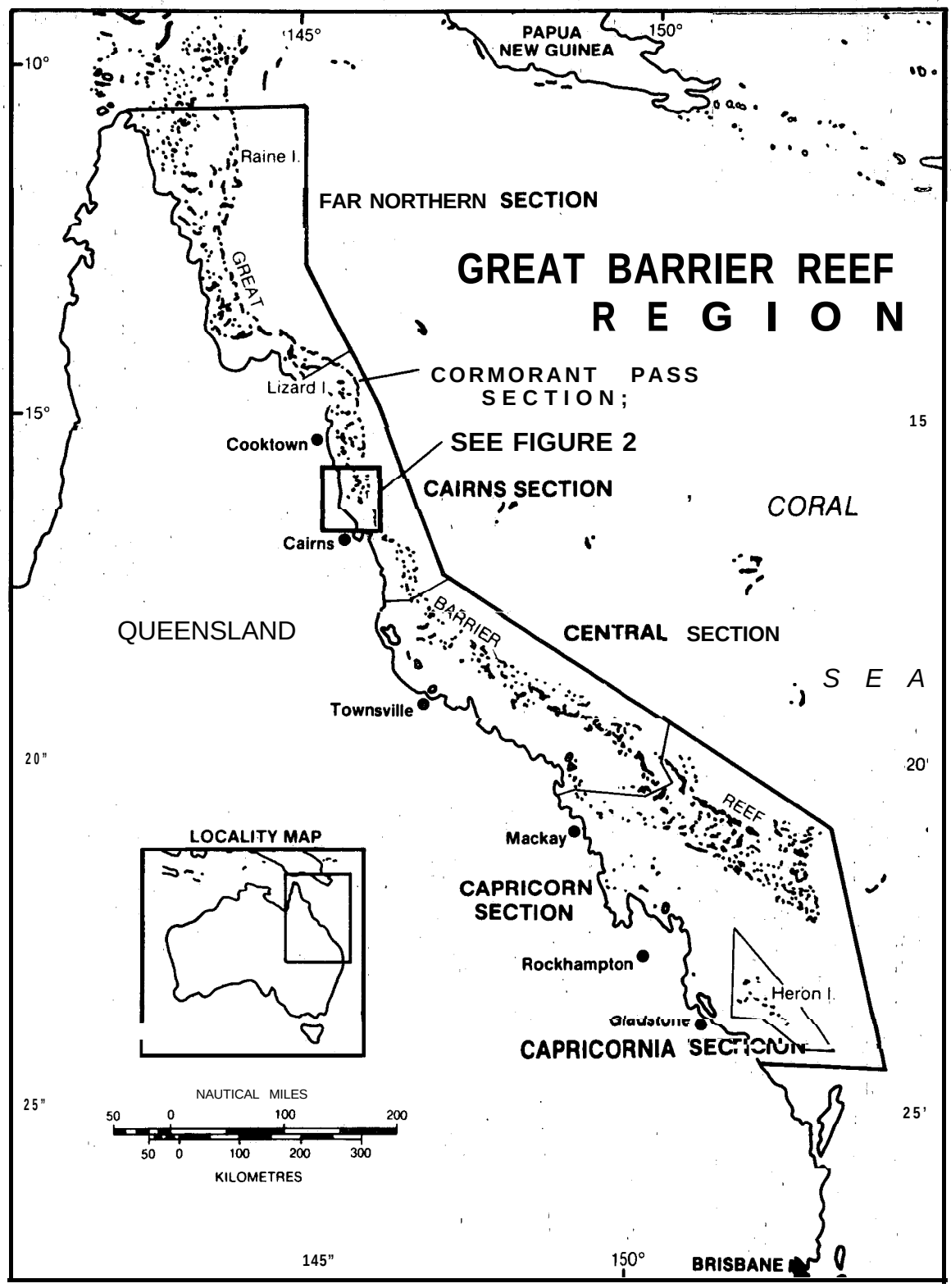

Figure 1. Great Barrier Reef Region Showing Location of Cape Tribulation Reefs,

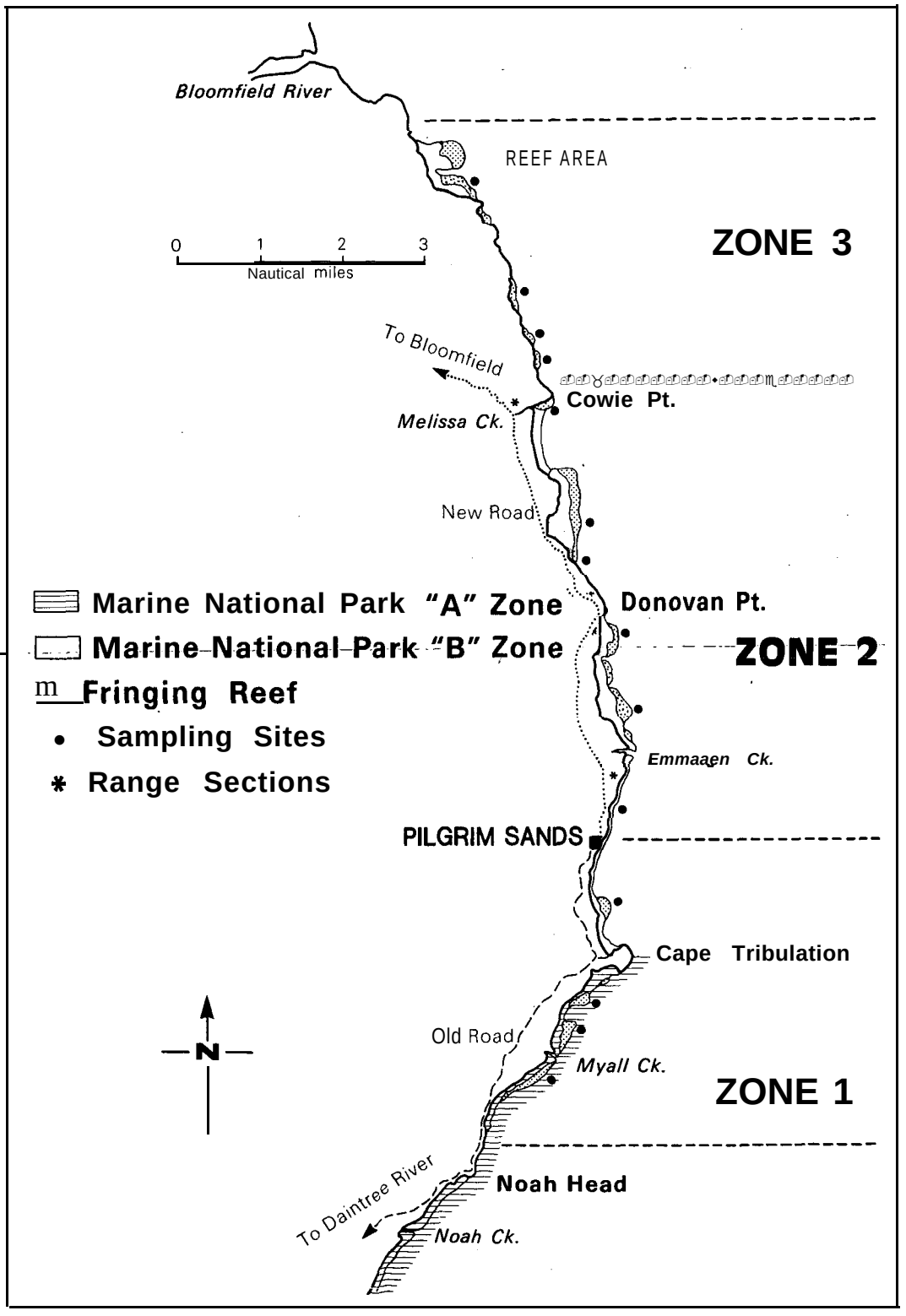

Figure 2. Coastal Detail

TABLE 1: CAPE TRIBULATION RESEARCH AND MONITORING PROGRAM

PROJECT	OBJECTIVE(S)	RESEARCHER(S)	METHOD(S)	DURATION	COST EST. ($A)
Research					
a. Effects of disturbed rain-forest catchments on adjacent fringing reefs - Cape Tribulation area	(i) to evaluate the impact of unsealed roads and related earthworks on fringing reefs in the Cape Tribulation area. (ii) to measure changes caused by the roadworks, both within catchments and in the nearshore zone.	Assoc Prof. D. Hopley (James Cook Uni.)	*Literature Review *Monitoring of: . rainfall . stream level and sediment level . catchment characteristics . reef flat hydrodynamics . inshore sediment levels *Calibration with other studies	3 years	$ 38,500
b. Sedimentary setting of fringing reefs Donovan Point	(i) to document geological sediment facies. (ii) delineate shallow stratigraphy of peri-reef sediments. (iii) Core and recover datable material from reef and off-reef deposits.	Dr. D.P. Johnson Prof. R.M. Carter Mr. J. Hills (James Cook Uni)	*Literature Review *Sidescan sonar mapping *Seismic mapping *Coring and sediment sampling *Radiocarbon dating of core material	1 year	$ 5,500
Monitoring					
a. Monitoring Coral Recruitment-Cape Tribulation cringing Reefs	(i) to determine whether these are significant variations in coral recruitment between selected sites. (ii) to assess whether runoff from the new road has affected recruitment rates	Dr. V. Harriott Mr. D. Fisk (Private Consultants)	*Placement of sets of settlement plates at each monitoring site (each plate covered by Platygyra and a small colony of Acropora palifera and 6 monthly analysis *Survey of permanent grids	-3 years.	$15,300

PROJECT	OBJECTIVE(S)	RESEARCHER(S)	METHOD(S)	DURATION	COST EST. ($A)
b. Monitoring Cape Tribulation Fringing Reefs	(i) To determine whether the Cape Tribulation to Bloomfield Rd. is having/has had an effect on corals, fish and invertebrate fauna of the adjacent fringing reefs.	Dr. A.M. 'Ayling Dr. A.L. Ayling (Sea Research)	*Initial survey and selection of sites • 6 monthly surveys of fixed sites -line transect surveys -stereo photography -measurement of large colonies -50 X 20m coral trout counts -incidental observations *Overall data analysis	3 years	$ 2,200 (initial) $87,500 (main)