

## OUTLINE OF PROJECTS AND INVESTIGATORS

This section provides details of all management-related projects coordinated by the GBRMPA and supported by COTSAC funds. Projects are grouped into the following subject areas, consistent with the COTSAC's recommendations:

- \* Geological studies
- \* Human factors affecting crown-of-thorns starfish
- \* Non-biological control
- \* Biological control
- \* Socio-economic research
- \* Risk analysis
- \* Oral history
- \* Surveys
- \* Public information

### Notes on Interpreting Project Outlines

Investigators' addresses shown are those during the study. Status of projects is as of the time of this report's preparation (April 1990). Expenditure is the dollar amount actually spent in the financial year (July to June). Unspent funds from projects' budgets were carried over into subsequent financial years. Because of this carry-over, COTSAC funds were, or are scheduled to be, spent in the 1989/90 financial year, even though the program concluded in June 1989.

GBRMPA procedures for funding research projects include the preparation of "Consultancy Agreements" or "Research Grants" which, among other conditions, stipulate reporting dates and report formats. For most projects, researchers are requested to submit brief "Progress Reports" during the course of their projects and a "Draft Final Report" at the completion of their research. This "Draft Final Report" is sent for external peer review and returned to the researcher for amendment in the light of reviewers' comments. The final, edited version is called the "Final Report" and its acceptance by the GBRMPA signifies the completion of the project.

In most cases, researchers were paid an "Advance" on commencement of their project, "Progress Payments" on submission of Progress and Draft Final Reports, and a "Final Payment" on acceptance of the Final Report by the Authority.

A number of the projects are continuing under funding through the new, post-COTSAC research program. This program is referred to as the COTSREC program after the Crown of Thorns Starfish Research Committee, the new advisory body to the Authority which replaced the COTSARC, following recommendations by Professor D.T. Anderson in his review of the COTSAC program.

As Table 2 shows, actual expenditure of COTSAC funds very closely reflects recommendations by the COTSARC.

Annual expenditure of COTSAC and GBRMPA funds for the management-related projects coordinated by the GBRMPA

Table 2

| Project Areas           | 1985/86   | 1986/87   | 1987/88   | 1988/89   | 1989/90   | Total       | Recommended<br>by COTSAC |
|-------------------------|-----------|-----------|-----------|-----------|-----------|-------------|--------------------------|
| Geological Studies      | \$79,540  | \$5,000   | \$71,205  | \$31,000  | \$20,105  | \$206,850   | \$210,000                |
| Human Factors           | \$50,351  | \$104,870 | \$50,818  | \$57,680  | \$32,953  | \$296,672   | \$250,000                |
| Non-biological Controls | \$7,228   | \$59,259  | \$6,415   | \$2,800   | \$675     | \$76,377    | nfs                      |
| Biological Controls     | \$42,126  | \$38,844  | \$28,000  | \$4,142   | \$3,721   | \$116,833   | \$165,000                |
| Socio-economics         | \$25,000  | \$14,800  | \$1,760   | \$2,000   | ---       | \$43,560    | \$50,000                 |
| Risk Analysis           | \$25,000  | \$8,000   | ---       | ---       | ---       | \$33,000    | \$35,000                 |
| Oral History            | \$9,000   | \$1,000   | ---       | ---       | ---       | \$10,000    | \$30,000                 |
| Surveys                 | \$19,900  | \$6,500   | \$5,000   | \$14,848  | \$3,500   | \$49,748    | nfs                      |
| Public Information      | ---       | \$14,731  | \$295     | \$8,000   | \$6,000   | \$29,026    | nfs                      |
| Miscellaneous           | ---       | \$8,000   | ---       | ---       | ---       | \$8,000     | nfs                      |
| Administration*         | \$87,482  | \$61,930  | \$90,166  | \$88,048  | ---       | \$327,626   | \$425,000                |
| Unallocated             | \$18,173  | ---       | ---       | ---       | \$92,608  | \$110,781   |                          |
| Management Total        | \$363,800 | \$322,934 | \$253,659 | \$208,518 | \$159,562 | \$1,308,473 | \$1,165,000              |
| Ecological Total        | \$558,000 | \$530,500 | \$553,460 | \$356,000 | ---       | \$1,997,960 | \$1,895,000              |
| COTSAC Total            | \$921,800 | \$853,434 | \$807,119 | \$564,518 | \$159,562 | \$3,306,433 | \$3,060,000              |

nfs      \*  
 Area of research recommended, but no funds specified.  
 Administration included salaries of permanent and contracted core research program staff, expenses incurred in COTSARC meetings and workshops, travel and incidentals. COTSARC had envisaged a full time coordinator with funds to run workshops and meetings (\$85,000 p.a. for 5 years) but this did not eventuate because of restrictions on Australian Public Service staffing levels at the time.

## GEOLOGICAL STUDIES

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|                     |   |                 |
|---------------------|---|-----------------|
| <b>Title</b>        | Role of <i>Acanthaster</i> in reef degradational processes: historical perspective and current influence.   |                 |
| <b>Investigator</b> | Assoc. Prof. R.A. Henderson (James Cook University)   |                 |
| <b>Objectives</b>   | To determine whether:<br>(1) contemporary <i>Acanthaster</i> infestations leave a skeletal record in surface sediment;<br>(2) horizons of prehistoric sediments containing a similar skeletal record of <i>Acanthaster</i> can be recognised;<br>(3) such skeletal aggregations are isochronous and testify reliably to prehistoric infestations. |                 |
| <b>Status</b>       | Project completed.  |                 |
| <b>Expenditure</b>  | 1985/86:  | \$79,540        |
|                     | 1986/87:  | \$5,000         |
|                     | <b>Total:</b>   | <b>\$84,540</b> |

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|                      |  |                 |
|----------------------|--|-----------------|
| <b>Title</b>         | Search for evidence within subsurface sediments of the occurrence of previous aggregations of crown-of-thorns starfish on Heron Reef, southern Great Barrier Reef.   |                 |
| <b>Investigators</b> | Dr P. Flood (University of New England) and Dr E. Frankel (University of Technology, Sydney)   |                 |
| <b>Objectives</b>    | (1) To collect and examine subsurface sediments from vibracores for evidence of previous aggregations of crown-of-thorns starfish on Heron Reef;<br>(2) To relate the findings on density of skeletal elements with the results of Henderson and Walbran's (1988) study of surface sediments on this reef. |                 |
| <b>Status</b>        | Draft Final Report received 1 May 1989.  |                 |
| <b>Expenditure</b>   | 1987/88:   | \$20,000        |
|                      | 1989/90:   | \$5,890         |
|                      | <b>Total:</b>  | <b>\$25,890</b> |

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|----------------------|--|-----------------|
| <b>Title</b>         | Search for evidence within surface and subsurface sediments for the occurrence of previous aggregations of crown-of-thorns starfish in the southern Great Barrier Reef Province. (Study 2: Capricorn and Pompey Reefs).  |                 |
| <b>Investigators</b> | Dr P. Flood (University of New England) and Dr E. Frankel (University of Technology, Sydney).  |                 |
| <b>Objectives</b>    | <ol style="list-style-type: none"> <li>(1) To collect and examine surface sediments for evidence of recent aggregations of crown-of-thorns starfish on selected Capricorn Reefs;</li> <li>(2) To collect, examine and date subsurface sediments by vibracoring at these sites;</li> <li>(3) To relate findings on density of skeletal elements with AIMS crown-of-thorns starfish database reports of recent outbreak histories;</li> <li>(4) To process existing surface sediment samples collected by Dr Frankel from reefs between Mackay and Capricorn reefs.</li> </ol> |                 |
| <b>Status</b>        | Draft Final Report received 31 August 1989.  |                 |
| <b>Expenditure</b>   | 1987/88:   | \$9,000         |
|                      | 1989/90:   | \$1,860         |
|                      | <b>Total:</b>  | <b>\$10,860</b> |

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|                      |  |                 |
|----------------------|--|-----------------|
| <b>Title</b>         | Distribution of crown-of-thorns starfish skeletal elements in surface sediment, Central and Southern Sectors of the Great Barrier Reef.  |                 |
| <b>Investigators</b> | Assoc. Prof. R.A. Henderson (James Cook University) and Dr P.J. Moran (AIMS)   |                 |
| <b>Objectives</b>    | <ol style="list-style-type: none"> <li>(1) To examine surface sediments of ten Central Section reefs for which recent AIMS surveys have accurately established crown-of-thorns starfish population densities;</li> <li>(2) To establish whether a relationship exists between contemporary crown-of-thorns starfish population densities and the distribution of skeletal elements.</li> </ol> |                 |
| <b>Status</b>        | Draft Final Report due March 1990.   |                 |
| <b>Expenditure</b>   | 1987/88:   | \$19,000        |
|                      | 1989/90:   | \$3,855         |
|                      | <b>Total:</b>  | <b>\$22,855</b> |

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**Title** Single element accelerator mass spectrometry of crown-of-thorns starfish skeletal remains obtained from subsurface sediment.

**Investigator** Assoc. Prof. R.A. Henderson (James Cook University)

**Objectives** (1) To resolve the stratigraphic uncertainty concerning the down-core distribution of *Acanthaster* elements in John Brewer and Green Island Reef sediment cores. This was to be done by selecting small populations of *Acanthaster* elements from small subsurface core intervals and to obtain dates by AMS techniques on individual elements to assess their age comparability.

**Status** Project completed.

**Expenditure**

|               |                 |
|---------------|-----------------|
| 1987/88:      | \$23,205        |
| 1988/89:      | \$1,000         |
| <b>Total:</b> | <b>\$24,205</b> |

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**Title** Past and present distribution of crown-of-thorns starfish (*Acanthaster planci*) along the Great Barrier Reef. Study 3: northern Great Barrier Reef.

**Investigators** Dr. P. Flood (University of New England) and Dr E. Frankel (University of Technology, Sydney)

**Objectives** (1) To collect and examine subsurface sediments from vibracores for evidence of previous aggregations of COTS on several reefs to the north of Lizard Island, northern GBR.

**Status** Field work completed.

**Expenditure**

|               |                 |
|---------------|-----------------|
| 1988/89:      | \$30,000        |
| 1989/90:      | \$8,500         |
| <b>Total:</b> | <b>\$38,500</b> |

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## HUMAN FACTORS AFFECTING CROWN-OF-THORNS STARFISH

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|----------------------|---|----------------|
| <b>Title</b>         | Investigation of predation on <i>Acanthaster planci</i> by reef fishes: gut sample analyses and literature survey.  |                |
| <b>Investigators</b> | Prof. J.H. Choat and Mr R. Birdsey (James Cook University)  |                |
| <b>Objectives</b>    | (1) To conduct a pilot study of the diet of carnivorous reef fishes, including commercially exploited lethrinids and serranids;<br>(2) To provide a literature review of feeding habits of large carnivorous reef fishes. |                |
| <b>Status</b>        | Project completed.  |                |
| <b>Expenditure</b>   | 1986/87:  | \$3,695        |
|                      | 1987/88:  | \$2,707        |
|                      | 1988/89:  | \$1,826        |
|                      | <b>Total:</b>   | <b>\$8,228</b> |

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|                      |   |                |
|----------------------|---|----------------|
| <b>Title</b>         | The consequences of commercial fishing on possible predators of the crown-of-thorns starfish on the Great Barrier Reef.   |                |
| <b>Investigators</b> | Prof. J.H. Choat and Mr A. Steven (James Cook University)   |                |
| <b>Objectives</b>    | (1) To investigate the sources of reef fish catch return by species, time and region on the Great Barrier Reef;<br>(2) To establish a database of such information and provide estimates on the catch rates of reef fishes. |                |
| <b>Status</b>        | Project completed.  |                |
| <b>Expenditure</b>   | 1986/87   | \$5,000        |
|                      | 1989/90   | \$2,500        |
|                      | <b>Total:</b>   | <b>\$7,500</b> |

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|---------------------|---|-----------------|
| <b>Title</b>        | The relationship between <i>Acanthaster</i> outbreaks and water mass characteristics in the Great Barrier Reef Region.  |                 |
| <b>Investigator</b> | Dr D. van Claasen (GBRMPA)  |                 |
| <b>Objectives</b>   | (1) To produce a sequential study of the water mass characteristics of productivity as indicated by the distribution of chlorophyll "a", suspended sediment levels as indicated by water colour and circulation using remotely sensed Coastal Zone Colour Scanner (CZCS) imagery. |                 |
| <b>Status</b>       | Five chlorophyll and five turbidity distribution maps produced and methodology described in Final Report. Initial analysis of maps in relation to <i>A. planci</i> outbreaks to be undertaken by Authority staff.   |                 |
| <b>Expenditure</b>  | 1985/86:  | \$28,045        |
|                     | 1986/87:  | \$9,568         |
|                     | 1987/88:  | \$7,268         |
|                     | 1988/89:  | \$1,123         |
|                     | 1989/90:  | \$3,032         |
|                     | <b>Total:</b>   | <b>\$49,036</b> |

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|----------------------|--|----------------|
| <b>Title</b>         | Population dynamics of crown-of-thorns starfish on Suva Barrier Reef, Fiji.  |                |
| <b>Investigators</b> | Dr L.P. Zann (GBRMPA) and Mr J. Brodie (University of the South Pacific)   |                |
| <b>Objectives</b>    | (1) To monitor growth, abundance and distribution of populations of juvenile and adult starfish on Suva Reef;<br>(2) To monitor annual recruitment of COTS on Suva Reef. |                |
| <b>Status</b>        | Data to 1989 published, project continuing with COTSREC funds.   |                |
| <b>Expenditure</b>   | 1985/86:   | \$4,806        |
|                      | 1986/87:   | \$72           |
|                      | 1987/88:   | \$366          |
|                      | 1988/89:   | \$271          |
|                      | 1989/90:   | \$2,670        |
|                      | <b>Total:</b>  | <b>\$8,185</b> |

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|----------------------|---|-----------------|
| <b>Title</b>         | Study of crown-of-thorns predators on or in the vicinity of reefs of the Great Barrier Reef.  |                 |
| <b>Investigators</b> | Assoc. Prof. R. Endean, Dr A.M. Cameron and Dr H.I. McCallum (University of Queensland)   |                 |
| <b>Objectives</b>    | <ol style="list-style-type: none"> <li>(1) To provide unequivocal scientific evidence on the identities of as many as possible of the specialist and generalist predators of <i>Acanthaster</i> found on or in the vicinity of reefs of the Great Barrier Reef;</li> <li>(2) To determine the population density of each of the identified major specialist predators and each of the major generalist predators;</li> <li>(3) To determine whether there are differences between reefs in the densities of these predators which can be related to the history of crown-of-thorns starfish activity and human use of the reefs.</li> </ol> |                 |
| <b>Status</b>        | Project completed.  |                 |
| <b>Expenditure</b>   | 1985/86:  | \$13,000        |
|                      | 1986/87:  | \$27,000        |
|                      | 1988/89:  | \$8,000         |
|                      | <b>Total:</b>   | <b>\$48,000</b> |

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|---------------------|---|-----------------|
| <b>Title</b>        | Evidence of anthropogenic impact in the Green Island Region of the Great Barrier Reef.  |                 |
| <b>Investigator</b> | Dr R.B. Johns (University of Melbourne)   |                 |
| <b>Objectives</b>   | <ol style="list-style-type: none"> <li>(1) To attempt to identify anthropogenic inputs to the water column and to benthic sediments across selected transects;</li> <li>(2) To assess which, or whether or not, identified inputs can be associated with terrestrial sources;</li> <li>(3) To identify chlorinated hydrocarbon at the sampling stations.</li> </ol> |                 |
| <b>Status</b>       | Draft Final Report received and reviewed.   |                 |
| <b>Expenditure</b>  | 1986/87:  | \$16,000        |
|                     | <b>Total:</b>   | <b>\$16,000</b> |

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|----------------------|---|-----------------|
| <b>Title</b>         | Anthropogenic influences on nearshore coral reefs, via mainland runoff, and correlations with spatial and temporal patterns in <i>Acanthaster planci</i> population explosions.   |                 |
| <b>Investigators</b> | Assoc. Prof. D. Hopley and Ms C. Rasmussen (James Cook University)  |                 |
| <b>Objectives</b>    | (1) To ascertain the exact effect of enhanced phosphate levels on coral colony growth;<br>(2) By way of a coring program commencing in the Cairns area, but then extending both north and south indicate how the geochemical changes may have changed through time, and thus identifying a possible change in anthropogenic influences, particularly over the last 100 years. |                 |
| <b>Status</b>        | Project continuing; delays caused by problems with availability of chemical analysis equipment.   |                 |
| <b>Expenditure</b>   | 1986/87:  | \$28,900        |
|                      | 1987/88:  | \$24,000        |
|                      | 1988/89:  | \$22,790        |
|                      | 1989/90:  | \$9,500         |
|                      | <b>Total:</b>   | <b>\$85,190</b> |

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|                     |   |                |
|---------------------|---|----------------|
| <b>Title</b>        | A land use study to investigate potential agricultural chemical inputs to marine environments in the northern Great Barrier Reef Region.              |                |
| <b>Investigator</b> | Mr P.S. Valentine (James Cook University)   |                |
| <b>Objectives</b>   | (1) To provide a comprehensive account of existing land use patterns and present use of agricultural chemicals throughout the Barron River catchment. |                |
| <b>Status</b>       | Project completed.  |                |
| <b>Expenditure</b>  | 1986/87:  | \$4,000        |
|                     | 1987/88:  | \$1,600        |
|                     | <b>Total:</b>   | <b>\$5,600</b> |

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|----------------------|--|----------------|
| <b>Title</b>         | Compilation of an information base and timetable for an interdisciplinary study of Green Island.   |                |
| <b>Investigators</b> | Prof. J.H. Choat and Mr I. Baxter (James Cook University)  |                |
| <b>Objectives</b>    | (1) To review available information on Green Island from published studies, unpublished data and aerial and geological surveys;<br>(2) To compile a bibliography of works relevant to the interdisciplinary study;<br>(3) To compile a catalogue of maps and aerial photographs;<br>(4) To produce a working map of Green Island for the planning of sampling programs and monitoring sites. |                |
| <b>Status</b>        | Draft Final Report received and reviewed.  |                |
| <b>Expenditure</b>   | 1986/87:   | \$1,000        |
|                      | 1989/90:   | \$400          |
|                      | <b>Total:</b>  | <b>\$1,400</b> |

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|                      |  |                 |
|----------------------|--|-----------------|
| <b>Title</b>         | A multidisciplinary study of anthropogenic changes on Green Island: information base, ecology, systems, sedimentology, hydrology and reef growth.  |                 |
| <b>Investigators</b> | Assoc. Prof. D. Hopley and Prof. J.H. Choat (James Cook University)  |                 |
| <b>Objectives</b>    | (1) To review previous published and unpublished information on Green Island;<br>(2) To compile a bibliography of relevant literature;<br>(3) To coordinate planning of interdisciplinary groups;<br>(4) To survey sessile organisms and fish and establish a monitoring program;<br>(5) To determine the thickness of sediments on expanding seagrass beds;<br>(6) To determine the change in growth of corals;<br>(7) To determine changes in the geochemistry of corals;<br>(8) To determine the hydrology of the island. |                 |
| <b>Status</b>        | Draft Final Reports received and reviewed.   |                 |
| <b>Expenditure</b>   | 1987/88:   | \$14,000        |
|                      | 1989/90:   | \$5,887         |
|                      | <b>Total:</b>  | <b>\$19,887</b> |

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**Title** Database of *A. planci* outbreaks in the South Pacific.

**Investigator** Dr L.P. Zann (GBRMPA)

**Objectives**

- (1) To identify any commonalities existing amongst widely separated geographic areas which have experienced crown-of-thorns starfish outbreaks;
- (2) To use this information to support or refute the "predator removal" and "terrestrial run-off" hypotheses.

**Status** Project continuing with COTSREC funds.

**Expenditure**

|               |                 |
|---------------|-----------------|
| 1985/86:      | \$4,500         |
| 1986/87:      | \$9,635         |
| 1987/88:      | \$877           |
| 1988/89:      | \$2,670         |
| 1989/90:      | \$2,213         |
| <b>Total:</b> | <b>\$19,895</b> |

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**Title** Recruitment and dynamics of *Acanthaster planci* on Green Island.

**Investigator** Mr D. Fisk (Reef Research and Information Services)

**Objectives**

- (1) To search for newly settled (0+ year) crown-of-thorns starfish in high and low hard coral cover areas, and in shallow (reef flat) and deeper (slope) habitats;
- (2) To monitor high coral cover areas for older (1+ year) individuals.

**Status** Project continuing with COTSREC funds.

**Expenditure**

|               |                 |
|---------------|-----------------|
| 1988/89:      | \$11,000        |
| 1989/90:      | \$3,751         |
| <b>Total:</b> | <b>\$14,751</b> |

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**Title** Collaboration with Professor Yamaguchi in preparation for future crown-of-thorns starfish culturing work.

**Investigator** Mr J. Keesing (AIMS)

**Objectives**

- (1) To assess the feasibility of carrying out collaborative research into rearing and using juvenile *Acanthaster planci* in manipulative experiments.

**Status** Project continuing with COTSREC funds.

**Expenditure**

|               |                |
|---------------|----------------|
| 1988/89:      | \$7,000        |
| <b>Total:</b> | <b>\$7,000</b> |

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|---------------------|---|----------------|
| <b>Title</b>        | The impact of the crown-of-thorns starfish <i>Acanthaster planci</i> (L.) on the community structure, demography and morphology of massive corals.            |                |
| <b>Investigator</b> | Mr L. DeVantier (AIMS)  |                |
| <b>Objectives</b>   | (1) To obtain precise information on the effects of predation by <i>A. planci</i> on the population structures of approximately 100 species of massive coral. |                |
| <b>Status</b>       | Project continuing with COTSREC funds.  |                |
| <b>Expenditure</b>  | 1988/89:  | \$3,000        |
|                     | <b>Total:</b>   | <b>\$3,000</b> |

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#### NON-BIOLOGICAL CONTROL

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|                     |  |              |
|---------------------|--|--------------|
| <b>Title</b>        | A review of crown-of-thorns starfish control in Japan.   |              |
| <b>Investigator</b> | Ms L. Worland (Griffith University)  |              |
| <b>Objectives</b>   | (1) To interview scientists and officials engaged in control programs in Japan;<br>(2) To collect and translate reports, survey techniques and methods and assess their relevance to the Great Barrier Reef. |              |
| <b>Status</b>       | Project completed.   |              |
| <b>Expenditure</b>  | 1985/86:   | \$842        |
|                     | <b>Total:</b>  | <b>\$842</b> |

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|                      |  |                 |
|----------------------|--|-----------------|
| <b>Title</b>         | Artificial barriers for crown-of-thorns starfish management.   |                 |
| <b>Investigators</b> | Mr R. Bell & Mr B. Kettle (Marine Bio Logic)   |                 |
| <b>Objectives</b>    | (1) To determine the effectiveness of various materials and construction styles as physical barriers to the movement of juvenile and adult crown-of-thorns starfish;<br>(2) To determine the effects of marine fouling on the effectiveness of these barriers. |                 |
| <b>Status</b>        | Project completed.   |                 |
| <b>Expenditure</b>   | 1986/87:   | \$16,150        |
|                      | <b>Total:</b>  | <b>\$16,150</b> |

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|---------------------|---|-----------------|
| <b>Title</b>        | Evaluation of small-scale eradication of crown-of-thorns starfish using Armed Services volunteers: Grub Reef; John Brewer Reef; Holbourne Island Reef; Credlin Reef.  |                 |
| <b>Investigator</b> | Dr L.P. Zann (GBRMPA)   |                 |
| <b>Objectives</b>   | <p>(A) GRUB REEF EXERCISE</p> <p>(1) To test the feasibility of using Service divers to control a relatively small, isolated infestation of starfish to maintain a high coral cover in the area;</p> <p>(2) To establish the detailed economic costing of the exercise to evaluate the cost/benefit;</p> <p>(3) To establish contingency plans for the eradication of starfish on reefs, and parts of reefs, of importance to tourism and science;</p> <p>(4) To re-evaluate various control methods, including the use of copper sulphate injection and spreading of quicklime.</p> <p>(B) JOHN BREWER REEF EXERCISE</p> <p>(1), (2) and (3) above;</p> <p>(4) To eradicate a pocket of starfish on the eastern reef crest.</p> <p>(C) HOLBOURNE ISLAND EXERCISE</p> <p>(1) To test the feasibility of controlling a starfish population at the whole-reef scale and (2) and (3) above.</p> <p>(D) CREDLIN REEF CONTROL</p> <p>(1) To eradicate starfish in a coral viewing area used by Roylen Cruises.</p> |                 |
| <b>Status</b>       | Project completed.  |                 |
| <b>Expenditure</b>  | 1985/86:  | \$6,386         |
|                     | 1986/87:  | \$43,109        |
|                     | 1987/88:  | \$6,415         |
|                     | 1988/89:  | \$2,800         |
|                     | 1989/90:  | \$675           |
|                     | <b>Total:</b>   | <b>\$59,385</b> |

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## BIOLOGICAL CONTROL

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**Title** A preliminary investigation into factors affecting mortality of *A. planci* larvae raised under field and laboratory conditions.

**Investigator** Dr D. Sutton (James Cook University)

**Objectives** To determine:  
(1) if planktonic larvae of *A. planci* develop the characteristic bacterial populations found on adult and juvenile starfish;  
(2) whether marine bacteria are significant to the development and survival to settlement stage;  
(3) if marine bacteria are pathogenic to *A. planci* larvae.

**Status** Project completed.

**Expenditure**

|               |                |
|---------------|----------------|
| 1987/88:      | \$4,000        |
| 1988/89:      | \$886          |
| <b>Total:</b> | <b>\$4,886</b> |

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**Title** Identification of the bacterial populations associated with crown-of-thorns starfish and assessment of their role in the ecology of the starfish.

**Investigator** Dr D. Sutton (James Cook University)

**Objectives** (1) To identify bacteria associated with field and aquarium populations of crown-of-thorns starfish;  
(2) To devise diagnostic procedures for detection of these bacteria;  
(3) To examine the relationship between bacteria and disease in crown-of-thorns starfish.

**Status** Project completed.

**Expenditure**

|               |                 |
|---------------|-----------------|
| 1985/86:      | \$18,737        |
| 1986/87:      | \$20,000        |
| <b>Total:</b> | <b>\$38,737</b> |

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| <b>Title</b>         | Studies on the diseases of the crown-of-thorns starfish <i>Acanthaster planci</i> .  |                 |
| <b>Investigators</b> | Prof. R.S.F. Campbell and Dr J.S. Glazebrook (James Cook University)   |                 |
| <b>Objectives</b>    | (1) Obtain comprehensive data on the naturally occurring diseases of <i>A. planci</i> , including bacterial, viral, parasitic and other conditions (eg. starvation) which may occur clinically or subclinically. |                 |
| <b>Status</b>        | Draft Final Report in preparation.   |                 |
| <b>Expenditure</b>   | 1985/86:   | \$23,389        |
|                      | 1986/87:   | \$18,844        |
|                      | 1987/88:   | \$24,000        |
|                      | 1988/89:   | \$3,256         |
|                      | 1989/90:   | \$3,721         |
|                      | <b>Total:</b>  | <b>\$73,210</b> |

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### SOCIO-ECONOMIC RESEARCH

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|---------------------|--|----------------|
| <b>Title</b>        | An assessment of the impact of crown-of-thorns starfish outbreaks on commercial fisheries.   |                |
| <b>Investigator</b> | Mr P. Matthew (Fisherman)  |                |
| <b>Objectives</b>   | (1) To describe from interviews the structure of the commercial reef fishery;<br>(2) To establish fishermen's perceptions of changes in catches and fishing effort;<br>(3) To relate any decreases in catch with known episodes of COTS outbreaks. |                |
| <b>Status</b>       | Project completed.   |                |
| <b>Expenditure</b>  | 1987/88:   | \$1,760        |
|                     | 1988/89:   | \$2,000        |
|                     | <b>Total:</b>  | <b>\$3,760</b> |

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|---------------------|---|-----------------|
| <b>Title</b>        | Socio-economic consequences of major populations of crown-of-thorns starfish.   |                 |
| <b>Investigator</b> | Dr T. Hundloe (Griffith University)   |                 |
| <b>Objectives</b>   | (1) To ascertain the financial, employment and net economic effects on the users of the Great Barrier Reef of major populations of crown-of-thorns starfish;<br>(2) To assess users' attitudes to crown-of-thorns starfish. |                 |
| <b>Status</b>       | Draft Final Report received and reviewed.   |                 |
| <b>Expenditure</b>  | 1985/86:  | \$25,000        |
|                     | 1986/87:  | \$14,800        |
|                     | <b>Total:</b>   | <b>\$39,800</b> |

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### RISK ANALYSIS

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|----------------------|---|-----------------|
| <b>Title</b>         | Biological and economic risk analysis, crown-of-thorns starfish.                              |                 |
| <b>Investigators</b> | Dr T. Hundloe and Dr J. Parslow (Griffith University)   |                 |
| <b>Objectives</b>    | (1) To undertake a risk analysis to contribute to assessment of the need for control of COTS. |                 |
| <b>Status</b>        | Draft Final Report received and reviewed.   |                 |
| <b>Expenditure</b>   | 1985/86:  | \$25,000        |
|                      | 1986/87:  | \$8,000         |
|                      | <b>Total:</b>   | <b>\$33,000</b> |

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### ORAL HISTORY

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|                      |   |                 |
|----------------------|---|-----------------|
| <b>Title</b>         | Oral history of human use and experience of crown-of-thorns on the Great Barrier Reef.  |                 |
| <b>Investigators</b> | Dr A. Chase and Ms R. Ganter (Griffith University)  |                 |
| <b>Objectives</b>    | (1) To undertake an oral history study to determine what evidence there is for the occurrence of previous aggregations of COTS. |                 |
| <b>Status</b>        | Project completed.  |                 |
| <b>Expenditure</b>   | 1985/86:  | \$9,000         |
|                      | 1986/87:  | \$1,000         |
|                      | <b>Total:</b>   | <b>\$10,000</b> |

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## SURVEYS

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|----------------------|--|-----------------|
| <b>Title</b>         | Survey of crown-of-thorns starfish in Capricorn and Capricornia Sections.  |                 |
| <b>Investigators</b> | Drs A.M. and A.L. Ayling (Sea Research)  |                 |
| <b>Objectives</b>    | (1) To survey selected reefs in the Capricorn and Capricornia Sections for COTS in conjunction with coral and coral trout surveys. |                 |
| <b>Status</b>        | Project completed.   |                 |
| <b>Expenditure</b>   | 1985/86:   | \$15,000        |
|                      | <b>Total:</b>  | <b>\$15,000</b> |

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|---------------------|---|----------------|
| <b>Title</b>        | A preliminary indication of the abundance and distribution patterns of <i>Acanthaster planci</i> on the Great Barrier Reef. |                |
| <b>Investigator</b> | Dr A. Ayling (Sea Research)   |                |
| <b>Objectives</b>   | (1) To compare data collected by manta tow with that collected from intensive search transect counts using SCUBA.           |                |
| <b>Status</b>       | Draft Final Report in preparation.  |                |
| <b>Expenditure</b>  | 1986/87:  | \$2,500        |
|                     | 1989/90:  | \$500          |
|                     | <b>Total:</b>   | <b>\$3,000</b> |

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|                     |  |                |
|---------------------|--|----------------|
| <b>Title</b>        | A preliminary investigation of juvenile crown-of-thorns starfish, <i>Acanthaster planci</i> (L.) on reefs in the Central Section of the GBR.   |                |
| <b>Investigator</b> | Mr R. Bell (James Cook University)   |                |
| <b>Objectives</b>   | (1) To survey Rib, John Brewer, Beaver Reefs and the Palm group reefs for juvenile <i>A. planci</i> ;<br>(2) To study the population dynamics of juveniles on Rib Reef and Pelorus Island (pilot study). |                |
| <b>Status</b>       | Project completed.   |                |
| <b>Expenditure</b>  | 1985/86:   | \$4,900        |
|                     | <b>Total:</b>  | <b>\$4,900</b> |

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|----------------------|---|----------------|
| <b>Title</b>         | Survey of distribution and abundance of crown-of-thorns starfish on reefs of the Whitsunday Region.   |                |
| <b>Investigators</b> | Mr R. van Woessik, Mr A. Steven (James Cook University) and Mr L. DeVantier (AIMS)  |                |
| <b>Objectives</b>    | (1) To comprehensively survey fringing and offshore reefs for crown-of-thorns starfish and coral damage in the Whitsunday Region;<br>(2) To initiate local controls as necessary. |                |
| <b>Status</b>        | Project completed.  |                |
| <b>Expenditure</b>   | 1988/89:  | \$8,986        |
|                      | <b>Total:</b>   | <b>\$8,986</b> |

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|----------------------|--|-----------------|
| <b>Title</b>         | Use of near infra-red aerial photography for monitoring effects of <i>Acanthaster planci</i> outbreaks.  |                 |
| <b>Investigators</b> | Assoc. Prof. D. Hopley and Ms P. Catt (James Cook University)  |                 |
| <b>Objectives</b>    | (1) To monitor changes to the shallow reef areas exposed on extreme low tides on reefs previously affected by <i>Acanthaster</i> (Helix, John Brewer and Grub Reefs); currently affected (Wheeler and Credlin Reefs) and with the potential for infestation by <i>Acanthaster</i> (Davies Reef, etc.). |                 |
| <b>Status</b>        | Project continuing.  |                 |
| <b>Expenditure</b>   | 1986/87:   | \$4,000         |
|                      | 1987/88:   | \$5,000         |
|                      | 1988/89:   | \$5,862         |
|                      | 1989/90:   | \$3,000         |
|                      | <b>Total:</b>  | <b>\$17,862</b> |

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## PUBLIC INFORMATION

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|---------------------|--|
| <b>Title</b>        | (1) Video Release: "The Crown of Thorns Story"<br>(2) Special Issue "Australian Science Magazine"  |
| <b>Investigator</b> | Dr L.P. Zann (GBRMPA)  |
| <b>Objectives</b>   | (1) To produce a 25 minute educational video of the crown-of-thorns starfish phenomenon and the COTSAC Research Program for schools, tourists and others. Release June 1987;<br>(2) To produce a supplement issue of the Australian Science Magazine on the above for distribution to schools and others. Publication July 1987. |
| <b>Status</b>       | Projects completed; booklet to be updated in 1990/91.  |
| <b>Expenditure</b>  | 1986/87: \$14,731<br>1987/88: \$295<br><br><b>Total:</b> \$15,026  |

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|----------------------|---|
| <b>Title</b>         | Interpretive crown-of-thorns starfish display for Wonderland Aquarium.                |
| <b>Investigators</b> | Dr L.P. Zann and other GBRMPA Staff   |
| <b>Objectives</b>    | (1) To set up a public display of aspects of the crown-of-thorns starfish phenomenon. |
| <b>Status</b>        | Project completed   |
| <b>Expenditure</b>   | 1988/89: \$8,000<br><br><b>Total:</b> \$8,000   |

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|---------------------|--|
| <b>Title</b>        | Interactive crown-of-thorns starfish display for Wonderland Aquarium.  |
| <b>Investigator</b> | Mr B. Kettle (Marine Bio Logic)  |
| <b>Objectives</b>   | (1) To set up a computer-based interactive display of aspects of the crown-of-thorns starfish phenomenon, including research and management. |
| <b>Status</b>       | Draft program completed.   |
| <b>Expenditure</b>  | 1989/90: \$6,000<br><br><b>Total:</b> \$6,000  |

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## MISCELLANEOUS RESEARCH

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|---------------------|---|----------------|
| <b>Title</b>        | CORSPEX   |                |
| <b>Investigator</b> | Dr E. Wolanski (AIMS)   |                |
| <b>Objectives</b>   | (1) To develop tracking technology and a model of behaviour of water movements around a coral reef. |                |
| <b>Status</b>       | Draft Final Report received and reviewed.   |                |
| <b>Expenditure</b>  | 1986/87:  | \$8,000        |
|                     | <b>Total:</b>   | <b>\$8,000</b> |

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