

FACT SHEET

THEME 1:

STATUS OF ECOSYSTEMS

INTRODUCTION

In 2006 the Australian Government established the Marine and Tropical Sciences Research Facility (MTRSF) to develop “world-class public good research” projects that utilize the collaborative efforts of the best Australian tropical environmental researchers. A budget of \$40 million dollars over 4 years, was allocated to MTRSF.

All approved projects have to be directly relevant to the conservation and sustainable use of North Queensland's environmental assets, including the Wet Tropics rainforests, the Great Barrier Reef and the connecting coastal regions.

5 major issues, or Themes, of immediate and significant issues were identified

The MTRSF projects are divided into 5 Research Themes:

| THEME | | DESCRIPTION |
|---------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Theme 1 | Status of the Ecosystems | <p>Understanding the condition, trend and interdependencies of environmental assets of the North Queensland region; developing methods to support ongoing regular assessment and reporting; and developing methods to identify priorities for action.</p> <p>Program 1 – Great Barrier Reef Program 2 – Rainforests & Catchments Program 3 – Torres Strait Program 4 – Species of Conservation Concern</p> |
| Theme 2 | Risks & Threats to the Ecosystem | <p>Understanding the threats to, and their impacts on the environment and hence the North Queensland region, and developing options to mitigate them</p> <p>Program 5i – Marine Program 5ii – Rainforests & Catchments Program 6 – Invasive Pests</p> |
| Theme 3 | Halting & Reversing the Decline of Water Quality | <p>Understanding the causes and effects of changing water quality and water resource use in North Queensland's coastal catchments; developing options for improving practices, reducing risks and mitigating adverse impacts; and developing ways to measure the effectiveness of regulation, management and other actions to halt and reverse declines. This goal supports the objectives of the Australian and Queensland Government's Reef Water Quality Protection Plan (Reef Plan).</p> <p>Program 7 – Water Quality</p> |
| Theme 4 | Sustainable Use & Management of Natural Resources | <p>Understanding the current and potential industry and community uses of biodiversity and natural resources with respect to ecological, social and economic sustainability; and providing information and options to assist North Queensland managers, industries and communities to optimise the use of biodiversity resources and minimise adverse impacts of use where they occur.</p> <p>Program 8 – Great Barrier Reef Program 9 – Rainforests & Catchments</p> |

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|----------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Theme 5 | Enhancing Delivery | Increasing the relevance and adoption of research in policy development, management applications and use practices; supporting effective data exchange and adoption of data standards; funding the delivery of relevant reports in the public interest; providing system wide overviews through the integration of biophysical studies of the environmental assets of North Queensland and the integration of social and economic research into these; and providing access to data and knowledge for organisations and the public. Program 10 – Enhancing Delivery |
|----------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Modified from the MTSRF website: www.rrrc.org.au/mtsr/

As part of Theme 5 (Enhancing Delivery), TTNQ was contracted to facilitate the flow of information from MTSRF to the tourism industry in tropical Queensland (Project 5.10.2) through a series of easy-to-understand Fact Sheets, each one specific to one of the themes. These Fact Sheets set the framework for understanding why this research is important and what the potential impacts are to the environment, our communities and the local tourism industries.

Theme 1: Status of the Ecosystems, includes 4 main focus areas:

1. Great Barrier Reef
2. Rainforest and Catchments
3. Torres Strait
4. Species Conservation Concern.

BRIEF OVERVIEW OF THEME 1

Ecosystems can be a difficult to comprehend because they can be just about any size. They can be as large as an entire rainforest or ocean, covering a huge geographical area, or they can be as small as a puddle or backyard garden.

An ecosystems is the BIG PICTURE - all living and nonliving things (plants, animals, microorganisms, soils, rocks, and minerals; water and local atmosphere).

It is, however, made up of smaller components:

‘communities’ – the group of all living things

‘populations’ – smaller groups made up of only one type of organism.

‘habitats’ – the area where one particular organism lives and gets all its food.


So...an ecosystem is a collection of a variety of ‘populations’ living in a ‘community’ and interacting with the non-living elements of the area.

To successfully conserve and preserve ecosystems, including the flora (plants) and fauna (animals) living within them, it is essential to gather enough scientific information to put together a model of what is happening within that ecosystem at a given time – this is called baseline. In other words, it is like taking a snapshot of the ecosystem.

Repeating these studies at different times captures additional snapshots. By putting all these snapshots together and comparing them, researchers can begin to understand how the ecosystem works and what trends are occurring.

This, in turn, allows them to create models to predict reactions to potential changes, both natural and man-made. It also helps identify the actual threats facing a particular ecosystem.

Environmental managers, armed with this information, develop appropriate management tools (e.g. legislation, zoning, best practices) to conserve and protect the ecosystem from negative impacts.



Conservation...
managing environmental quality and natural resources in a sustainable manner that also takes into consideration social and economic aspects.

Preservation...
protecting the environment, or a species, exactly as it is without any consideration to sustainable use or social or economic changes.

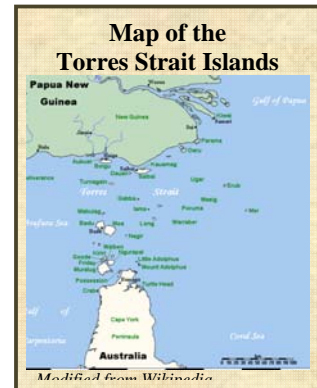
It is important to have an accurate baseline of what is happening within an ecosystem because it sets the benchmark against which other measurements can be compared. This allows researchers to document:

- gradual natural change over time
- rapid catastrophic change due to major events, both natural (e.g. cyclones) or man-made (e.g. land clearing)
- reaction to climate change
- Recovery rates from environmental damage

THE TORRES STRAIT ECOSYSTEM

The Torres Strait region of northern Australia is unique. There are more than 270 Torres Strait islands in the area between the northern tip of Cape York and the southern tip of Papua New Guinea (approximately 120km). Largest island is about 23km wide, while the smallest ones, coral cays, are less than a hectare (100m x 100m) in area.

The Torres Strait ecosystem is very different from that of the Great Barrier Reef, and requires specific investigation. Studying the ecological status of this unique ecosystem will help sustainably manage the natural resources from increasing fisheries and environmental pressures.



ICONIC SPECIES

'Iconic species' is a term used to describe a species (usually animal) that is particularly unique or special to a particular area.

The species is generally endemic to the region (not found anywhere else), physically striking in appearance (e.g. large, cute, brightly coloured), plays an important role in maintaining the health of the environment, and is a drawcard that attract people (tourists or scientists) to the region specifically to see it.

In many cases, iconic species are rare, threatened or endangered. This makes it even more important to gather information on their behaviour, biology, population dynamics, and resilience to disturbance and environmental change.



| ICONIC SPECIES OF TROPICAL NORTH QUEENSLAND | |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| ECOSYSTEM | SPECIES |
| Marine | <ul style="list-style-type: none"> ▪ Marine turtles ▪ Dugong ▪ Coastal dolphins |
| Rainforest | <ul style="list-style-type: none"> ▪ Cassowaries ▪ Arboreal (tree dwelling) marsupial (e.g. tree kangaroos) |

RELEVANT MTSRF RESEARCH

The Marine and Tropical Sciences Research Facility (MTSRF) is part of an Australian Government initiative to “develop collaborative, public benefit research between Australia’s best tropical environmental researchers to support the conservation and sustainable use of North Queensland’s environmental assets - the Wet Tropics rainforests, the Great Barrier Reef and the connecting coastal regions”.

The Reef and Rainforest Research Centre (RRRC) is contracted to administer the MTSRF Research Programme in North Queensland.

There are 5 main themes of study:

- Theme 1 Status of ecosystems
- Theme 2 Risks and Threats to the Ecosystems
- Theme 3 Halting & Reversing decline in water quality
- Theme 4 Sustainable use and management of natural resources
- Theme 5 Enhancing Delivery

Studies of the status of ecosystems lie within Theme 1, and include the following four main areas of focus:

| Project Number | Project Name | Main Objectives | Research Providers |
|----------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Project 1 | Program 1 - Status and Trends of Species and Ecosystems in the Great Barrier Reef | To determine indicators of reef health and identify thresholds of potential concern for the Great Barrier Reef ecosystem. | AIMS CSIRO DPI&F Reef Check Australia UQ |
| Project 2 | Program 2 - Status and Trends of Species and Ecosystems in the Wet Tropics Rainforest | To report on the condition and trend of key environmental assets, including ecosystem processes and biodiversity, in the Wet Tropics rainforests and catchments. To collate and evaluate current knowledge on biodiversity and other environmental assets. | CSIRO JCU |
| Project 3 | Program 3 - Torres Strait: Status, Use and Trends | To establish key background knowledge of the status, use and trends of Torres Strait ecosystems. | AIMS CSIRO TSRA |
| Project 4 | Program 4 - Species and Communities of Conservation Concern | To collect data on the condition and trends of dugong, marine turtles and coastal dolphins in the Great Barrier Reef and Torres Strait regions. To collect data on the condition and trends of threatened species and communities in the rainforests and catchment areas, including cassowaries and arboreal marsupials. | CSIRO JCU TSRA |

Acronyms: AIMS (Australian Institute of Marine Science), ANU (Australian National University), CSIRO (Commonwealth Scientific & Industrial Research Organisation), DPI&F (Department of Primary Industries & Fisheries), GU (Griffith University), JCU (James Cook University), UNSW @ ADFA (University of New South Wales Australian Defence Force Academy), UQ (University of Queensland)