Status of Coral Reefs in the Turks and Caicos Islands
An Overview for the Global Coral Reef Monitoring Network

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Introduction

The Turks and Caicos Islands (TCI) are located in the Atlantic Ocean between 21° 00' and 21° 60' North Latitude and between 71° 00' and 71° 30' West Longitude. These islands are part of the United Kingdom's Overseas Territories. There are eight coraline islands and 40 small cays providing a total land area of about 166 square miles. The total population is estimated at about 23,000 persons, with about 73% of the population residing on one island, Providenciales (37.5 square miles in area).

The four largest islands have fringing reefs at about .5 to 1.5 miles offshore, along the entire northern coast generally with a wall drop off starting between 45-60'. The three larger islands in the eastern portion of the chain have fringing reefs along their eastern coast. Shallow water patch reefs are common around all of the islands and cays.

The coral reefs and beaches are among the major tourist attractions of these islands, especially to the island of Providenciales which gets about 98% of the tourist arrivals. Import duty and tourism are the main sources of revenue for the government, with almost 121,000 visitors recorded for 1999 (TCI Tourist Board, unpublished database records).

The marine systems are important to the local lobster and conch fisheries which provide some local employment and additionally generate revenue through exports (the country's only export). There are five processing plants which handled the 1,423,448 lbs of conch (a value of about US$1 million) and 690,846 lbs of lobster (a value of almost US$2 million) landed in 1998 (Department of Environment and Coastal Resources, unpublished database records). Fin-fish landings are on a much smaller scale, primarily for local consumption and are not as important to the economy as lobster and conch.

Status of Coral Reef Benthos and Fishes

There is no monitoring of coral reef benthos and fishes in the TCI. However, one rapid survey by visiting researchers (Operation Raleigh) using the Reef Watch data sheets was done between 1988 and 1989 around Providenciales, Grand Turk, and West Caicos. Between 1993 and 1994, permanent transects were set up in Grand Turk for coral reef monitoring, with the assistance of the Caribbean Environmental Health Institute. Monitoring was initiated with the assistance of a resident European researcher, but it is unclear how many data sets were collected and the monitoring data could not be located. In 1999, a rapid assessment was done at sites around several islands by another team of visiting researchers using the AGRRA protocol.

The first baseline survey of the fringing reef of Grand Turk was done in 1994 and quantitative information on reef substrate and fish community were collected using photo transects and visual census (Gaudian, 1995). This survey was conducted at five of the most frequently dived sites

along a 40m transect at each site, from the mooring buoy along the contours of the reef crest parallel to the reef edge. The line intercept method was used to quantify substrate cover. The highest percentage coral cover was 42% and the lowest was 25.9%. Sponge ranged from 16.4% to 0.13%. Macro-algae was low in all transects. The number of species of coral varied from 10 to 18 species among the sites with *Montastrea annularis* and *M. cavernosa* as the dominant species. Gaudian (1995) found that the number of fish species and fish diversity were similar for each site but the relative abundance was different among sites. Twenty-five species of fish were recorded with Parrot fish (Redband, Queen and Princess), and Blue Tang being dominant. This study also found changes in the benthic community at the most frequently dived site which was associated with diver impacts. No information on coral bleaching or coral diseases was provided in this report.

Manfrino and Riegl (1999), using the AGRRA Protocol conducted surveys in Grand Turk, Providenciales, West Caicos, South Caicos, Ambergris Cay and the Mouchoir Bank. Overall, they found that coral mortality was low (<1%), diversity was high (37 scleractinian species), and coral cover as high as 30% at several locations. On the eastern facing banks, dead *Acropora palmata* was more abundant than live stands of this species. *A. cervicornis* was rare. Almost no macro algae were found except in the Mouchoir Bank, Ambergris Cay and in the shallow *A. palmata* reef zone. The level of coral diseases was low but its diversity was high, especially on the north side of Providenciales where tourism activities are intense. It was also reported that all coral diseases found in the Caribbean were present in the TCI with the highest levels found in the most heavily dived sites. Coral bleaching was noted as rare (<1%). Fish diversity was comparatively high, with groupers abundant, diverse and relatively large.

The School for Field Studies, based on the island of South Caicos in collaboration with the Department of Environment and Coastal Resources (DECR), has also done some limited marine surveys over the past few years around South Caicos as part of the directed research projects of its students who come from the USA and Europe.

The Coastal Resources Management Project (CRMP), based in Providenciales has conducted a few rapid assessments (visual survey) of reefs around Providenciales and West Caicos over the past year. In more exposed areas there are more development of the reef crest, back reef and patch reef areas. In the shallow reef crest/reef flat or patch reef areas in Providenciales, hard coral cover was generally of the order of 2-5% and 10-30% at a few sites; live *Acropora palmata* which was noted to be a dominant component from previous reports has been significantly reduced to 0-2% in most areas and up to 5-15% in the best sites, most likely the result of disease. With regard to macroalgae, *Dictyota sp*. constituted 10-50% cover in some areas and as high as 70%; in other patch or back reef areas *Microdictyon* sp (10-50%) and *Lobophora* (40-60%) were important components.

At less exposed areas such as Northwest Point and West Caicos, coral formations exist as a narrow band on the flat at the top of the wall and then on the side of the wall, either as spur and groove formations or a relatively vertical wall. On the flat at the top of the wall, coral cover is relatively low 5-10% (as high as 10-20%); in some areas *Dictyota sp* covered from 5-20% and *Lobophora sp* covered from 5-15% (in a few areas as high as 60% cover was recorded). On the shallower part of the reef face (15-25m) hard coral cover ranged between 20-50%; generally with a significant cover of *Lobophora sp* (30-60%). The deeper part of the reef wall showed higher hard coral cover of 30-60%, with lower amounts of *Lobophora* (20-50%).

Coral bleaching was noted in some shallow areas in 1999 but was not quantified; diseases have also been recorded, again not quantified but subjectively seems low. Sea urchin populations appear to be low and may be a contributing factor to the high levels of macroalgae

Status of Coral Reef Fisheries

There is little information available on the coral reef fisheries, including commercial, subsistence, recreational and aquarium trade. Some data exists for grouper, collected by the DECR,but more efforts were directed at lobster assessment and management in the past. Since 1994 the annual REEF fish count was conducted with the assistance of local dive operators and interested tourist divers at selected dive sites around the country. The status of this activity and the results of previous fish counts were not available.

Anthropogenic Threats to Coral Reef Biodiversity

The major human induced threats to coral reef biodiversity in the TCI include: nutrient discharge from marinas and coastal development, fish processing plants, conch aquaculture, and hotel sewage; heavy metal contamination from anti-fouling paints used on boats; damage to corals caused by snorkelers and divers; anchoring in coral reefs and seagrass beds; boat groundings; construction of tourism infrastructure and private jetties in the nearshore environment; uncontrolled fishing in the marine parks, and increasing visitor use of selected marine areas (a carrying capacity issue). In the most popular near shore, patch reef at a depth of 2-10 feet (Bight Reef), where coral beaching has been noticed and disease is present, there is repeated additional stress from snorkelers through trampling, breakage and scraping of coral, especially during low tide.

Current and Potential Climate Change Impacts

Coral bleaching has been observed on many of the reefs around Providenciales and West Caicos, but these have not been quantified.

Current MPAs and Monitoring And Conservation Management Capacity

There are 11 National Parks, 11 Nature Reserves and four Sanctuaries in the TCI. All of these protected areas, except five of the Nature Reserves, are marine protected areas or have significant marine components. Management plans have recently been prepared for the two major marine parks in Providenciales and for the West Caicos Marine National Park. Management responsibility for these three parks is with the Coastal Resources Management Project. The other protected areas are the responsibility of the Department of Environment and Coastal Resources. The National Trust also assists in management through implementation of an education and awareness programme.

There is however no active management of most of the protected areas outside of Providenciales. The CRMP is expected to evolve into the National Parks Service later this year and will assume

responsibility for all protected areas in the TCI, except for those areas leased to the National Trust.

Government Policies, Laws and Legislation

The trend in development in Providenciales, development proposals for West Caicos, current management of the national parks and the National Parks Regulation indicate that the maintenance of protected areas seem to favour recreational benefits for visitors and development opportunities for expatriates. Recreation/development priorities rather than broader conservation of coastal resources has led to the current type and intensity of uses within and adjacent to the parks.

Government's general policy on commercial development states that "the government is prepared to use any available Crown land (other than national parks, nature reserves, sanctuaries and areas of historical interest) for development in the right circumstances" (TCInvest, 1995?). However, the National Parks Ordinance provides for some types of development in national parks including buildings, marinas and other construction to facilitate enjoyment by the public.

A national policy specifically geared towards a conservation agenda for marine resources is not clearly defined, although there are a few policy documents that allude to conservation or sustainable development. A draft environmental strategy and action plan has also been prepared and is being finalised. Recently, the UK government proposed some policy guidelines for its Overseas Territories. Chapter Eight (Sustainable Development-the environment) of the UK White Paper on Progress Through Partnership (1999?) proposes the following policy objectives:

- To promote sustainable use of the Overseas Territories natural and physical environment, for the benefit of local people;
- To protect fragile ecosystems such as coral reefs from further degradation and to conserve biodiversity in the Overseas Territories;
- To promote sustainable alternatives to scarce resources or species which are used for economic purposes;
- To enhance participation in and implementation of international agreements by Overseas Territories.

The new TCI Strategic Country Programme (1999-2003) was prepared and agreed with Her Majesty's Government in October 1999. The aim of the Environment Section of this policy document to facilitate long term sustainable development of infrastructure and human settlement in a manner which minimizes unnecessary damage to the environment. Its three objectives are to:

1. Manage the TCI environment on a sustainable basis.

2. Develop further the partnership between the UK and the TCI on environmental issues.

3. Agree on shared commitments by both government and the community to sustainable development and the protection of the environment in the TCI.

The National Parks Ordinance (1975) and Regulations (1992) defined four categories of protected areas as well as the location and extent of the protected areas, prohibited activities, enforcement, penalties, and designation of zones for different uses. Other relevant legislation includes:

- Summary Offences Ordinance
- Wreck and Salvage Ordinance
- Public and Environmental Health Ordinance
- Physical Planning Ordinance
- Minerals (Exploration and Exploitation) Ordinance
- National Trust Ordinance
- Protection of Historic Wrecks Ordinance
- Coast Protection Ordinance
- Fisheries Protection Ordinance
- Fishery Limits Ordinance
- Wild Birds Protection Ordinance

There is no harmonisation among key pieces of legislation and there is the need for revision of the National Parks Ordinance, moreso when the National Parks Service is established, especially in terms of administration of the regulations and in the zone designations.

Gaps in Current Monitoring and Conservation Capacity

There are several factors that have contributed to a lack of monitoring and conservation of coral reefs in the TCI, especially within the marine protected areas. These factors are:

Geography: Some protected areas are not easily accessible and can only be reached after 2-3 hours of travel by boat, for example, French, Bush and Seal Cays. Further, during the ground swell season (November to March) the water is too rough for frequent access by the small patrol boats.

Institutional priorities: Three marine protected areas have only recently started to receive priority attention because of designated funding and management planning through the CRMP. Fishery related activities seem to be the priority of the DECR, although coral reef monitoring activities and reef/fishery research are planned for priority attention.

Human Resources: All agencies are under staffed, and not all staff have the requisite training and experience for the job. Additionally, there are issues of aptitude and inappropriate work ethics affecting the performance of critical tasks.

Equipment: All agencies have insufficient equipment to carry out daily operations, and in some cases out-dated or inappropriate equipment.

Collaboration: A mechanism for consistent and genuine collaboration among the key stakeholders for conservation efforts within the protected areas has not yet been defined. Some conflicts among several key agencies need to be resolved and clarification of rights and responsibilities in management of the protected areas need to be worked out before the collaboration mechanism can be defined and implemented.

Stakeholder Inputs: There is little formal organisation of all key stakeholders or users of reef resources to provide input to monitoring and conservation efforts as well as a mechanism which promotes sustainable use.

Conclusions and Recommendations For Coral Reef Conservation

Unless the human capacity and material resources issues are resolved, there is little likelihood that efficient and consistent monitoring of coral reefs will be implemented in a sustainable manner. However, increasing donor support, focussed on addressing these issues will be needed, since monitoring programmes have already been planned or designed by the key agencies. Another option may be funding through the recently approved Conservation Fund that is available to any local individual or agency meeting the criteria specified by the Fund.

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References

DFID (1999?). White Paper on Progress Through Partnership: Chapter Eight, Sustainable Development-the environment. DFID?

Gaudian, G. (1995). Sustainable environmental carrying capacity of dive sites on Grand Turk, TCI. The People's Trust for Endangered Species and the Department of Environment and Coastal Resources. Typescript.

Manfrino, C. and Riegl, B. (1999). Prelininary results from the Turks and Caicos Islands Reefs Assessment. Typescript.

TCInvest (1995?). Doing business in the Turks and Caicos Islands: Government Policies.

Turks and Caicos Islands Government (1998). Chapter 80: National parks ordinance and subsidary legislation. Revised edition as at 15th May, 1998.