Members Report **ICRI GM Japan/Palau (2) 2006/MR/9.0/Coral Cay Conservation**

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Member's report on activities to ICRI

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Reporting period **August 2005 – September 2006**

Summary of Activities

1. *Southern Leyte Coral Reef Conservation Project*. Continued surveying of Sogod Bay, S Leyte, Philippines. Installation and active monitoring of four community based fish sanctuaries in the municipality of Padre Burgos.

2. *Tobago Bleaching Project*. Bleaching surveys conducted in Tobago in October of 2005 showed 66% bleached corals with high inter and intra species variability.

3. *Red Sea Conservation Project*. A 3 month pilot project in Marsa Alam, Egypt confirmed its status as an area of good reef health and diversity, not yet affected by tourism. The installation of a sustainable management scheme and proper forward planning will help the area keep its status and avoid uncontrolled and unmitigated development as in Sharm el Sheikh.

4. *Project Bay Islands*. On the 28th of March 2006, the work on Roatan, Honduras came to a successful completion after 5 years of surveying, community work and counterpart training. The data will be used to create resource maps of the area highlighting 'good' that need protection and impacted areas that need to be monitored to assess the success of management plans.

Summary of pertinent points

Coral Cay Conservation will be commencing its Tobago Island Coral Reef Project in January of next year. Following on the success of the bleaching project, CCC will be undertaking a longer term project in order to identify key areas of ecological and commercial importance, working in close association with the Buccoo Reef Trust. Any parties interested in getting involved either through funding aid, partnership or uptake can make themselves known through info@coralcay.org

Projects Update

Red Sea Conservation Project – Egypt

In May 2005, senior science personnel from the CCC Society Red Sea Conservation Liveaboard, met with the *Hurghada Environmental Protection Conservation Association* (HEPCA), the Egyptian NGO concerned with the sustainable use of natural resources in the Red Sea, to discuss conservation issues in the region. As a result of these discussions, a request was made for CCC assistance to determine the current status of the reefs, threats and possible conservation initiatives in the region. CCC's Head of Marine Science, James Comley, returned to Egypt a month later to meet with HEPCA, officials from the Egyptian Environmental Affairs Agency (EEAA) and the National Parks Department to discuss how CCC's experience and resources could best be employed to support ongoing conservation efforts.

Coral Cay spend 3 months surveying the fringing reefs and pinnacles supporting reefal development accessed from Marsa Alam. This area is rich in relatively unspoilt reef systems but is potentially threatened by anthropogenic damage caused by uncontrolled and unmitigated development.

The information gathered was used to create a habitat map of the area using G.I.S. The information provides a clear picture of diversity 'hot-spots' and gives local government authorities a vital tool for the planning and implementation of coastal and marine policy.

The surveys have shown that there healthy and unspoilt reefs in the area. Biological indicators of this are high live hard coral cover and diversity and a wide variety of fish species with little human damage on most of the reefs. There is however, a significant amount of plastic being washed up on the local beaches, a problem affecting most of the Egyptian Red Sea due to a lack of environmental awareness and no waste management facilities. A clear and effective sustainable management plan must be set up in the area if Marsa Alam is to be secured as an eco-tourism destination.

Southern Leyte Coral Reef Conservation Project (SLCRCP) - Philippines

The Southern Leyte Coral Reef Conservation Project (SLCRCP) is a tri-partite initiative, convened jointly by Coral Cay Conservation (CCC), the Philippine Reef and Rainforest Conservation Foundation Inc. (PRRCFI) and the Provincial Government of Southern Leyte. The project has been undertaken with the objective of assisting in the conservation of the coral reefs of Sogod Bay for the long-term benefit and food-security of the residents of the Province. Three strategies have been identified as appropriate for achieving this objective, namely:

1 - Conservation education for the fisherfolk, schools, colleges, and Local Government Units (LGUs) of the Province

2 - Capacity building of technical skills amongst the employees of the Provincial Government of Southern Leyte

3 - Resource appraisal of the current status of the coral reefs of the bay

As a result of an innovative study visit to the famous Apo Island marine reserve in Negros Oriental, 4 new community-based Marine Protected Areas (MPAs) were created in the Municipality of Padre Burgos by the fisherfolk and LGUs. Furthermore, a series of successful teacher training workshops was held, 14 MPA wardens were tutored, extensive mangrove planting projects were undertaken, and Provincial Government Employees were qualified in SCUBA diving, plus marine science and surveying.

CCC survey teams conducted a total of 531 survey dives, producing a total of 671 individual survey records for the reefs of the bay. The location of each of these surveys was determined using a Global Positioning System (GPS) receiver, these data can be imported to a Geographic Information System (GIS), to facilitate spatial analysis. These data will be made freely available to the resource managers of Southern Leyte, to allow for target specific querying of the dataset, as well as the selected analysis.

Coral species diversity was found to be exceptional in certain areas of the bay with a number of rare species being identified. For example, 141 different species of corals were recorded on a single dive by the coral taxonomist, Dr. Douglas Fenner in December 2005.

Low abundances of commercially important fish and invertebrate species provides an indication of over-fishing of the reefs within the Bay and highlights the concern that fish stocks are considered to be both biologically and economically overfished in most areas of the Philippines.

The high diversity and abundances of fish species and live hard coral cover in existing fish sanctuaries, such as Napantau on the eastern coast of Sogod Bay, are extremely attractive to divers. The presence of Whale sharks and various other ‘megafauna’, such as turtles and different shark species, represent great potential for dive related tourism in this area.

Tobago Bleaching Project – Trinidad & Tobago

In order to determine the extent and nature of the 2005 coral bleaching episode on the reefs of their island, the Buccoo Reef Trust (BRT) and the Tobago House of Assembly (THA) decided to invite a team of 5 scientists from Coral Cay Conservation (CCC) to assist in undertaking targeted surveys of the coral bleaching in Tobago. Over a three week period commencing in October 2005, the reefs were assessed to establish the extent and severity of the coral bleaching on Tobago's main reef systems. In addition to this, an appropriate long-term monitoring programme was designed and installed to examine the recovery of bleached corals.

Surveys were conducted at 22 discreet sites, which were assessed using a Point Intercept Transect method, utilising a 20m transect chain marked at 25cm intervals. At each site, two deep and two shallow surveys were completed, producing over 7000 data points from 88 transects. Overall mean bleaching of hard corals was found to be 66% (71% on deep transects and 63% on shallow sites). Bleaching by geographic region was found to be largely consistent, with sites exhibiting greater than 85% bleaching dispersed throughout the target area. However, of the 9 transects exhibiting less than 20% bleaching, 5 were located near Speyside in the northeast of Tobago, perhaps indicating either localised tolerance to bleaching or superior water quality (lower temperatures, less silt and fewer nutrients).

Bleaching by species was found to be highly variable, both between and within species. Agaricia agaricites ('leaf') and Siderastrea radians ('rough starlet') were the most impacted species, with 93% of the observations for both species being bleaching. Madracis mirabilis ('yellow pencil') and Acropora palmata ('elkhorn') were the least impacted species (3% and 0% respectively). Although the low number of observations recorded for A. palmata (n=7) reflects the low abundance of the species, many additional stands were observed by the surveyors during the campaign and all appeared to be unbleached. Very high variability was found amongst the species of the Montastrea annularis complex ('boulder/mountainous star'), which demonstrated overall bleaching impacts of 73%. For example, at one site in Buccoo Reef, two adjacent stands of M. annularis (annularis) exhibited 97% and 6% bleaching impacts respectively, implying the existence of bleaching resistant combinations of the coral species, its algal symbionts, or both.

It is not possible to predict the nature and extent of any subsequent mortality/recovery to the reefs of Tobago. Whilst cyanobacterial overgrowth was observed on the colonial zoanthids of the *Palythoa* genus, there were no recorded observations of coral disease, tissue necrosis or turf-algal/cyanobacterial overgrowth on bleached scleractinian corals. However, the incidence of opportunistic coral diseases may be expected to peak at the end of the warm season, and thus remain to be quantified. The monitoring programme installed has been designed to gather these data.

Tobago Coral Reef Conservation Project – Trinidad & Tobago

CCC will be surveying the reefs of Tobago from October 2006 for a minimum period of three years. CCC is working in partnership with The Bucco Reef trust who have an established reputation in Tobago and internationally for reef conservation in the area. They have recently received funding to allow us to set up work there and provide them with much needed people power to collect the data required. The primary aims of the project are to:

- Map the benthic and fish communities in order to identify key areas of ecological and commercial importance for the inclusion in governmental management plans
- Provide data on reef health and threats to current reef health
- Monitor coral bleaching recovery and observe any future bleaching events
- Generate basic fish and coral species lists
- Providing training opportunities for local counter-parts and environmental awareness programmes for school teachers and students

Project Bay Islands – Honduras

Coral Cay Conservation has been working in partnership with Proyecto de Manejo Ambiental de Islas de la Bahía (PMAIB) on Roatán since 2000, when the two organisations joined forces to undertake Project Bay Islands - Roatán. In addition to capacity building programmes (such as the training of Honduran counterparts in SCUBA diving and marine ecological surveying) and community education initiatives (such as Schools Educational Open Days), CCC volunteers have undertaken an extensive programme of resource assessment on the coral reefs of the island.

The data gathered during this resource assessment have been used to create resource 'maps' of the island, highlighting 'good' areas that need to be protected from degradation, as well as impacted areas that need to be monitored for recovery or decline in response to implemented management plans. In addition, 138 Reef Check surveys have been conducted, with these data contributing to the Reef Check worldwide database of coral reef health.

The extensive community work undertaken by CCC's Project Scientists has resulted in numerous Schools Educational Open Days and beach clean-ups with the local communities, in addition to a series of teacher-training workshops on the neighbouring Bay Islands of Utila and Guanaja (in conjunction with PMAIB). In all, nearly 800 school children of all ages (and frequently their parents) have taken an active role in our environmental education workshops in the towns of Punta Gorda, Coxen Hole, Sandy Bay, French Harbour, Flowers Bay and Gravel Bay. Educational posters have been professionally produced in both Spanish and English, hundreds of reef collages and drawings have been made by the schools and even the interior of the public hospital in Coxen Hole has been painted.

Since 2000, around 150 Honduran counterparts have been trained under the CCC Marine Scholarship scheme, ranging from weekend-long 'reef-awareness' snorkelling workshops to full 5 week expeditions, learning to dive and to survey side by side with more than a thousand CCC volunteers. These counterparts have come from the local fishing and tourism communities as well as from the Universidad Nacional Autonoma de Honduras (UNAH) and the Universidad Jose Cecilio del Valle, both in Tegucigalpa. This 'passing-on' of knowledge is essential if the momentum gained by Project Bay Islands is to be continued upon the completion of the project.

The coral reefs of the West End of Roatán are very popular with the international tourist diving community and general tourists alike. They provide food and livelihoods for thousands of inhabitants of Roatán, and with appropriate management, they will continue to do so for the foreseeable future. They are an irreplaceable resource of incredible value, both in biological and economic terms. An analysis of key biological indicator species suggests that the reefs may be under a great deal of stress, and that appropriate management action must be undertaken if any decline in reef health is to be halted.

Overall, however, the corals of the reefs are in fair condition, with high coral cover being recorded in a number of sites, most notably in the Turtling (or Turtle) Bay and Crawfish Rock sectors (hard coral accounted for 51-75% on certain transects). Moderate stands of the now rare *Acropora cervicornis* were recorded in Turtle Bay and West Bay. The most commonly occurring hard coral species were found to be *Millepora* spp., *Porites astreoides*, *Montastrea annularis, Montastrea cavernosa* and *Agaricia agaricites*, all of which were recorded on over 80% of transects.

The data from the surveyed transects underwent hierarchical cluster analysis in PRIMER 5, and then discriminant analysis in MiniTab 13 in order to identify and define discreet ecological 'habitats'. Each individual survey record was then compared statistically against the others within its discreet 'habitat'. Conservation Management Values were then applied based on 5 indices, and were used to create a Geographic Information System (GIS) data 'map' of the region, highlighting key areas of high biodiversity and live hard coral cover. These areas can be considered to be of high ecological value and should their protection should be addressed by resource managers within the region.