



Support for the Establishment of Effectively Managed Platform Sites as Foundations for Resilient Networks of Functionally-Connected Marine Protected Areas

Meso-American Reef – Belize, Guatemala, Honduras, and Mexico

FY06 Annual Report

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3.4	Bringing the gender approach to the MAR region	On track	

Objective 4	A MAR ecoregional plan is adopted and implemented that reflects agreement by key conservation partners (local and international NGOs, government agencies and donors) on priority programs and activities, with the sharing of scientific and program data;		
4.1	Development of a conservation blueprint for the MAR region using relevant existing information and incorporating the resilience model.		
4.1.1	<i>Conservation targets and viability development.</i>	Completed	
4.1.2	<i>Threats sources identified and stakeholder analysis for the development of conservation strategies.</i>	Completed	
4.1.3	<i>Use a decision-making tool (such as MARXAN) to assemble updated optimal portfolio of sites using spatially described threats, targets and goals.</i>	On track	
4.1.4	<i>Validation of identified conservation portfolio through stakeholder participation</i>	Delayed	
4.2	Implementation of consultations with Community leaders and local government authorities in the MAR region to consolidate conclusions and to present them to the Tulum+8 steering committee for inclusion in the new MAR System Action Plan	Completed	

**Support for the Establishment of Effectively Managed Platform Sites as
Foundations for Resilient Networks of
Functionally-Connected Marine Protected Areas in the Mesoamerican Reef
*Belize, Guatemala, Honduras, and Mexico***

FY2006 GCP Progress Report

1. PROJECT BACKGROUND

The Mesoamerican Reef, the second largest coral reef system in the world, stretches for 625 miles along the coastline of Belize and parts of Mexico, Honduras and Guatemala. Lying just below the surface of the Caribbean Sea, the Mesoamerican Reef represents the best example of coral reef and mangrove diversity in the Atlantic realm. The reef is home to 66 species of coral, spiny lobsters, green moray eels, reef fish and a wide variety of other sea life including whale sharks – the largest fish in the ocean. Closer to land, sea turtles and Central America’s largest population of endangered manatees find shelter in mangrove habitats and sea grass meadows.

Although it plays an essential role in marine habitats and local communities, the Mesoamerican Reef is showing alarming signs of distress. Burgeoning tourism has invited additional coastal development and souvenir seekers to the reef. Forest clearing for agriculture has removed natural water filters, allowing silt, fertilizers and additional pollution to reach the sea. Growing intensity and frequency of fishing, especially at fragile fish spawning aggregation sites (SPAG), is taxing the ecosystem. Global climate change has accelerated coral bleaching, a phenomenon threatening reefs with extinction.

Fortunately, considerable opportunities exist for conserving the Mesoamerican Reef. Each of the neighboring nations continues to promote sustainable development as part of its voluntary commitment to the Convention on Biological Diversity. Having established a strong presence in the region resulting from groundbreaking science, used to shed light on the natural phenomena surrounding fish spawning aggregations, the Conservancy has included the Mesoamerican Reef in its goal to conserve a measurable amount of each of the Earth’s major habitat types by 2015. The Mesoamerican Reef is one of only three marine sites already identified for inclusion in the 2015 goal, which testifies to its significance.

Within this vision, the Nature Conservancy is working in collaboration with a coalition of stakeholders from the public and private sectors to achieve specific conservation objectives in the near term. Through the Global Conservation Program these include:

- A MAR ecoregional plan is adopted and implemented that reflects agreement by all key conservation partners (local and international NGOs, government agencies and donors) on priority programs and activities, adoption of conservation best practices, and sharing of scientific and program data.
- Four MPA platform sites, one in each country, are well managed by local partners and serve as examples of effective conservation and management for other protected areas within the MAR regional MPA network.

- All high priority reef fish spawning aggregation (SPAG) sites throughout the MAR are identified and monitored, and stocks of target fish species are stable or increasing at priority SPAG sites.
- Bleaching resistant areas of suitable sizes, scales, and distribution to replenish corals within the MAR system are identified and protected.
- The technical, managerial and marine science skills of at least 2,000 people are enhanced and result in improved MPA management, new economic opportunities for fishers and their families, more effective community leaders and conservation activists, and improved scientific understanding by both private and public stakeholders.
- The Alternative Economic Livelihood Program will be enhanced to meet the challenge of working at a MAR-wide scale to reduce the threat of over-fishing and allow fishers to benefit from the new economic opportunities that now present themselves. The expanded MAR Learning Center concept will be realized, dove-tailed with the alternative economic livelihood program, and foster greater regional collaboration through training, exchanges and the sharing of experience, information and data.

2. Overall Assessment of Progress and Management Issues

The Nature Conservancy has made significant progress on its core objectives for the MAR over the past years, mostly characterized by the need to:

- 1) Complete the eco-regional assessment to identify key strategies to enhance conservation of a network of MPAs within the Mesoamerican Reef Region;
- 2) Stabilize and strengthen capacity for conservation along the MAR despite numerous TNC and partner transitions;
- 3) Consolidate and focus the Conservancy's social science approach and ensure it is effectively applied toward conservation outcomes, particularly in the design of a community livelihood agenda and socioeconomic analysis at selected platform sites;
- 4) Initiate and consolidate scientific baseline information to incorporate structure analysis of the resilience approach based on the most complete rapid reef assessment ever done;
- 5) Initiate a very systematic process to validate SPAG sites in order to build on the success and momentum generated through the establishment of the 11 marine reserves based on spawning aggregations in Belize.

Given these considerations, the Conservancy, in collaboration with key conservation partners and stakeholders, achieved the following:

- 1) Validation of five new SPAGs (three in Mexico and two in Honduras) and enhanced capacity to identify and monitor the health of critical spawning aggregation sites throughout the Mesoamerican Reef;
- 2) Specific support to improve Belize's management of SPAGs and its national database;
- 3) A framework for developing the innovative MAR Learning Center is complete. In addition, 50 tools and existing capacity both inside and outside of TNC have been identified. Georgina Bustamante, the Learning Center Coordinator, is now developing the initial modules for the virtual Learning Center and initiating the first community group exchanges as well as two regional training activities.

- 4) Completion of resilience and coral monitoring training during an international meeting of the TNC worldwide resilience working group and TNC local partners and staff. The session on resilience factors was inspirational and provided guidance for the rapid reef assessments completed in Guatemala and Honduras and under development in Mexico and Belize. The information will be key to developing a quick response protocol for reef bleaching and a monitoring design for key sensitive or priority areas in the MAR region;
- 5) Commencement of the nursery habitat analysis in order to understand the role and value of coastal ecosystems and its relationship with major biological processes like SPAGs or key ecosystems in marine protected areas to ensure consideration of all important areas to protecting the full life cycle of target reef fish species;
- 6) Development and training on socioeconomic modeling for the MAR platform sites. For the first time, social and economic factors are being significantly considered alongside the biological variables. The tool will be very useful to test the potential impact of scenarios of decision making actions or prominent biological disturbances.

While these were important results in the third year of implementation, there have been important challenges and other management issues and lessons learned that will be incorporated in the fourth year of implementation. The Conservancy will ensure that effective strategies are in place to mitigate or plan for the often inevitable loss of critical staff in partner organizations and government agencies, in particular those upon which our work heavily relies. The Conservancy will revise, refine and focus its approach to SPAGs validation and monitoring to ensure that these efforts are in full alignment with the regional needs as well as contribute on a deep strategy for conservation along with the MPA systems established at the country level. Finally, based on the eco-regional assessment, an internal capacity assessment and the application of platform site criteria and stakeholder consultations, the Conservancy will consolidate and leverage efforts to identify mechanisms to dramatically increase marine conservation within the MAR region, while utilizing the virtual Learning Center as a delivery mechanism to share best practices and improve livelihoods along the Mesoamerican Reef.

Other important achievements made this year were

1. MoU with MAR Fund and SPAW Protocol of UNEP (United National Environmental Program)

TNC, through the Mesoamerican Reef Program, has signed memoranda of understanding with UNEP and the MAR Fund in order to establish cooperation mechanisms that allow us to maximize the coordination among our organizations and promote the work that the Learning Center is intent to carry out together with other organizations and projects in the Mesoamerican Reef area.

The Memorandum of Understanding with UNEP is mainly focused on the coordination with the ICRAN – MAR Project, particularly achieving the common objective of maximizing the distribution of tools developed by the ICRAN – MAR Program in the Mesoamerican Reef area with the intention to avoid duplication of effort and guarantee the maximum knowledge and application of products developed through this investments.

The MAR Fund has confirmed in a Memorandum of Understanding that in addition to general cooperation, it will cooperate with TNC-MAR to establish a framework for the development of the categorization system of MAR Fund beneficiaries groups, based on the development of some capacities that will be provided by the Learning Center. Actually, we are in a concept development phase for these mechanisms and the tools which were identified as necessary to establish the categories of the beneficiaries' groups to which the MAR Fund will be giving financial support are considered priorities for the development of the Learning Center. A complete development of the conceptual model and the beginning of the establishment of the tools will be part of the work priorities of the Learning Center in the next year.

2. Advisory Group meetings:

TNC held the first meeting of the MAR Program's Advisory Group to review the work plan and proposed activities and make specific suggestions about the program's next steps. The main elements suggested by the Advisory Group were the following:

- The development of a political agenda independent from the Tulum +8 process.
- Reviewing the resilience model and its possible adaptation to the Caribbean.
- Promotion of the resilience work in the Mesoamerican reef area.
- Design of a program to continue with the actions regarding the rapid reef assessment, which allows us to include monitoring as part of our program initiative.

3. Follow up to the Conservation Audit process carried out in 2004

In 2004, a conservation audit of TNC's Mesoamerican Reef Program was completed. Participating TNC, WWF and WCS staff analyzed the program's design and methodology. Important recommendations regarding program actions emerged from this process. These findings have significantly influenced the program's work over the past year and half. Among the most important are:

- Better align the MAR program with Conservation by Design, TNC's standard conservation approach. For example, the identification and ranking of critical threats has not been adequately conducted at the MAR scale, though these have been done for a number of the platform sites the MAR program has focused on.
- Build and leverage on what already exists by engaging in joint-planning efforts among all the MAR partners.

In order to respond to the Mesoamerican Reef Program audit findings, its operating plans and financial proposals were restructured.

As a follow-up in the learning and evaluation process, a meeting has been proposed for next fiscal year to review the progress made on recommendations from the 2004 audit and to review the reality of the Mesoamerican reef region to determine any redirection or identify any additional potential recommendations on how to improve the program's work in the near future. This meeting will include partners from new initiatives and projects in the Mesoamerican Reef

area, such as the ICRAN – MAR Program, CI, which has establishing its role as an important actor in the Mesoamerican Reef region, CORAL, and the organizations that were involved in the last audit including MBRS, WWF, WCS.

Finally, the MAR Program is now fully staffed and most of the Country Operating Units along the MAR region have specific planning instruments and/or priorities as well as human support to increase marine conservation actions.

Implementation Report

Objective 1: Build resilience into the MAR network through improved understanding of resilience principles and their application to management.

Activity 1.1: *Validate and monitor priority spawning aggregation sites*

Sub-Activity 1.1.1 Spawning aggregation site validation, evaluation and monitoring to further their conservation

Results Anticipated in FY06:

- Monthly SPAGs monitoring in two sites and validation of seven more sites in Honduras
- Monthly SPAGs monitoring in two sites and validation of six more sites in Mexico
- Baseline for three priority spawning aggregation sites in Belize completed.

To date, the Honduran Coral Reef Fund has conducted monitoring dives for the purpose of validation of reef fish spawning aggregations at five sites. Three of these sites, namely Punta Pelicano, Roatan Banks and El Avion, have been monitored consistently from December 2005 to June 2006 for ten days every month. Several species of snappers, groupers and jacks have been observed in aggregation at these sites and displaying several spawning behavior patterns, though only *Caranx latus* (Horse-eye jacks) have been observed spawning at Punta Pelicano. The data collected through the monitoring dives has helped to confirm that these sites are indeed important spawning grounds for multiple species of reef fish and thus warrant further monitoring activities at two of the more important sites to be able to establish a pattern of which species aggregate to spawn and when this occurs at the sites.

In Mexico, it was originally proposed to monitor two sites and validate six. However, not enough information had been obtained for the two sites, so it was agreed that eight sites would be validated instead. The SPAGS team was composed of marine staff from ASK and CONANP, as well as community members from Punta Allen, a coastal community adjacent to the Sian Ka'an Marine Reserve. All members of the team participated in the SPAGS training conducted by TNC personnel using the standard reef fish spawning aggregation monitoring protocol. Site validation began in December 2005 and a total of three sites were verified:

1) Name of Site: San Juan. Species: *Epinephelus striatus* and *Mycteroperca bonaci*.

Approximate Number of Individuals: 25.

2) Name of Site: Nichehabin. Species: *Epinephelus striatus*. Approximate Number of Individuals: 800.

3) Name of Site: Punta Pajaros. Species: *Lutjanus jocu*. Approximate Number of Individuals: 500.

Monitoring efforts were constrained this year mainly due to inclement weather conditions coupled with major boat problems that were experienced by the team during the middle of the season. However, three sites were verified and the effort did prove successful in documenting a

very important Nassau grouper aggregation at the Nichehabin site and Mutton Snapper aggregation at Punta Pajaros, both sites warranting a more comprehensive and consistent monitoring this upcoming spawning season to document other species that may be utilizing the sites as well as to establish the pattern relevant to the spawning events.

In Belize, the joint effort of TNC and members of the Belize spawning aggregation working group has enabled the successful monitoring of seven spawning aggregation sites and the establishment of baselines for three sites, namely Gladden Spit, Nicholas Caye and Rocky Point. The Gladden Spit spawning aggregation site has the most complete data set and is credited to the consistent efforts of the Friends of Nature monitoring team. For this site, monitoring data has helped establish a better understanding of what the populations are for the Cubera and Dog snappers, two of the main species that aggregate at the site in mass numbers. This data will be used by the fisheries department and the relevant co-management organizations to better inform on the ground management of the spawning aggregations.

Sub-Activity 1.1.2 Work with partners on evaluation of spawning aggregation sites in MPAs, and their protection.

Results Anticipated in FY06:

- Recommendations for a conservation plan for validated SPAG sites in and outside MPAs in Mexico and Honduras.
- Specific data compiled on reduction of illegal fishing in Belize.

Gladden Spit is known as one of the sites where the threat to spawning aggregations by illegal fishing has been most prevalent. FoN rangers/fisheries officers run daily surveillance patrols in the reserve to check compliance by all users. Particular attention is paid to compliance with the fisheries laws, especially those that are specific to the spawning aggregation closures and the relevant MPA. Rangers also gather data on all visitors to the Reserve and their activities. This data is maintained in a secure database from which reports are produced on a monthly basis. During this year, in response to increased incidents of infractions previously observed, and after numerous warnings issued, a “zero tolerance” policy was implemented in Gladden Spit. As a result, there have been fewer detentions than last year. The “zero tolerance” policy is implemented jointly by Friends of Nature and the Fisheries Department. This has resulted in a significant decrease in number of infractions from previous years and an indication of the knowledge of the existence of the reserve. This year, joint patrols by Belize Fisheries Department and Friends of Nature enforcement personnel have resulted in the arrest of three illegal fishermen.

The recommendations for a conservation plan for validated SPAG sites in and outside MPAs in Mexico and Honduras is delayed mainly due to the fact that the validation efforts in these countries has just recently started and will be carried over to next year’s activities. In Honduras, we tried for several months to work with BICA Utila and PROLANSTATE, local NGOs that managed protected areas where priority SPAG sites had been identified, but that activity was not a priority for either NGO for reasons such as: lack of funding and technical staff to co-sponsor the validation activities, changes in key personnel staff (PROLANSTATE), etc. This year, we

were only able to work on this component for Belize where more data on spawning aggregations is available.

Sub-Activity 1.1.3 Conservation status of Nassau Grouper SPAG sites in the MAR region

Results Anticipated in FY06:

- Comprehensive desk report analyzing the status of the Nassau Grouper in the Meso-American Reef.
- Case study of Caye Glory Nassau Grouper SPAG site.
- List of potential appropriate strategies for the long-term conservation of the Nassau Grouper along the Meso-American Reef.

A monitoring survey was conducted this year at the major Nassau grouper spawning aggregation sites by member organizations of the Belize Spawning Aggregation Working Group during the months of January and February 2006. Sites monitored this year included Nicholas Caye, Rise and Fall, Sandbore, Gladden Spit, Caye Glory and Northern Glovers. The number of individual fish observed range from below fifty at sites such as Rocky Point, Dog Flea and Nicholas Caye to 700 hundred at Gladden Spit, the highest ever observed at this site, 1205 at Sandbore, which is the average number observed over the past 4 years, to 3000 observed at Northern Glovers, the only site where actual spawning was observed by WCS staff. It should be noted that inclement weather conditions did affect the number of days that monitoring was possible, in some cases only a few dives were conducted.

In addition to that, a thorough analysis of the Belize spawning aggregation working group database was conducted through a consultancy by Dr. Kevin Rhodes. Between 1998 and 2006, 21 sites in Belize were monitored one or more times by nine separate organizations to document spawning aggregation abundance, fish length and spawning behavior for commercially important fishes along the Meso-American Reef (MAR). For Nassau grouper, *Epinephelus striatus*, findings show that Sandbore, Dog Flea (Turneffe Reef Atoll) and Emily (Caye Glory) are highly critical spawning sites for along the MAR (1,000s of individuals), with Gladden Spit and Rocky Point are secondary in importance in terms of abundance (100s of individuals). Interestingly, it is these highly critical sites that have recently received the least attention in terms of consistent monitoring efforts or protection (as enforcement) (i.e. Sandbore, Dog Flea, Emily). The MAR ecoregional assessment has identified sites in Turneffe and Lighthouse as possible future conservation investment sites which could help improve monitoring at important Nassau grouper SPAG sites. Peak Nassau grouper spawning appears to be in either January or February, with inter-annual variations common for this and other groupers. Past monitoring efforts, while laudable, have not fully captured the status of Nassau grouper at any site, with the exception of Gladden Spit where monitoring efforts by FoN have occurred systematically since 2003.

Only preliminary analysis of the status of this fish in Mexico and Honduras has been initiated after the monitoring season however, a more in-depth analysis will be conducted with the help of a consultant who has been identified and accepted the task for both countries. The analysis of the status of this activity will be implemented next year.

The Caye Glory study case is expected to start in August; it has been delayed due to conflicting schedules with the lead consultant who was unable to begin earlier. It was recently confirmed that the consultant is now available to conduct the work and a contract is currently being developed for this consultancy.

Activity 1.2: *Preliminary identification of bleaching resilient reefs in the MAR region*

Results Anticipated in FY06:

- Country and regional reports on current status of coral reefs with preliminary identification of resilient reef sites in the MAR region for targeted conservation efforts.

The rapid reef assessment of sites in the MAR region was initiated last August. This activity is applying the Atlantic and Gulf Rapid Reef Assessment (AGRRA) protocol to survey randomly selected 478 sites in the MAR region. The selection of sites was done using the random tessellation process, based on the maps of the Millennium Reef Mapping project and overlaying a grid of hexagons. On each hexagon, a primary and a secondary random site per reef type were selected.

Amigos de Sian Ka'an has been in charge of this task in Mexico, and to date, more than half of the 155 sites in Mexico have been completed. However, the surveys were interrupted by the strong storm and hurricane season that affected the area last year. The remaining sites (Central and Southern Sian Ka'an, Xcalak and Banco Chinchorro) will be surveyed in August and September 2006. In Honduras, through the administrative support from HCRF, the rapid reef survey started in June 2006 and has completed a total of 56 sites. The field campaign will conclude by 20 August 2006 with the surveying of sites in Omoa-Puerto Cortes and Bahia de Tela. In Belize, a consortium with WWF was created to conduct the assessment of close to 150 sites of which 2/3 have already been surveyed. Finally, in Guatemala, the survey of non-random sites was completed the first half of August 2006.

Next steps in this activity include the compilation of data which will then be sent to AGRRA for preliminary analysis and computation of data. The data will then be finally analyzed for the identification of suspected bleaching resilient sites and the final report will be produced by the end of FY07.

An action related to this activity was the Annual Workshop of the Reef Resilience Working Group that was held this year in the MAR region, at Cayos Cochinos. During that event, the MAR Program had the chance to review and consult with the reef resilience experts on the implementation of the resilience model in the region.

Activity 1.3: *Improved understanding of connectivity within the MAR*

Sub-Activity 1.3.1. Integrate connectivity information and models into Caribbean-wide and MAR ecoregional planning

Results Anticipated in FY06:

- Functional oceanographic circulation model is developed for shallow waters in the MAR region.
- Integration of circulation model into design of conservation blueprint.

Through a contract with the University of Miami and in partnership with World Resources Institute WRI, an ocean circulation model has been developed that represents the patterns of ocean currents in the MAR region. This work is based on an adaptation of the Oceanic General Circulation Model (OGCM) to explore reef population connectivity. This will include high resolution oceanic current simulations designed to estimate larval dispersal kernels for targeted marine organisms. These activities will utilize and build on the modeling capabilities that we have been previously developed for the Wider Caribbean.

The outputs from the circulation model will be coupled offline to a Lagrangian Stochastic Model (LSM) used to estimate larval dispersal over multi-time scales, given specific life history characteristics. This component tracks individual virtual larvae with active behavior within the modeled environment, (i.e., including currents and benthic habitat) until they settle on suitable habitat. The LSM integrates a GIS database to identify release locations (i.e. spawning sites) and settlement habitat along individual trajectories within the study region. The coupled biophysical model will use 1) spawning strategies, 2) empirical data on larval behavior and distributions, and 3) adult and suitable settlement habitats to disperse larvae, measure their recruitment, and quantify fluxes (i.e. larval exchange) between spawning populations. A preliminary progress on this research has produced the manuscript, "Surfing, spinning, or diving from reef to reef: how does it change population connectivity?" by Claire B. Paris, Laurent M. Chérubin, Ashwanth Srinivasan, Robert K. Cowen. This paper was submitted for consideration on a scientific journal. This manuscript explores the relative influence of biological and physical factors in reef population connectivity.

We expect to have the final products of this consultancy by September 2006. They will then be incorporated into the conservation blueprint.

Sub-Activity 1.3.2 Application of circulation model to fish species in the MAR region.

Results Anticipated in FY06:

- Modeling for eggs and larvae of key selected species conducted for integration in the ecoregional plan and in the application of the connectivity layer of the TNC resilience model.

As part of the contract with University of Miami, the model produced on Sub-Activity 1.3.1 will be used to explore dispersal of fish eggs and larvae from known spawning aggregation sites in the Mesoamerican Reef.

TNC will provide biological data such as adult spawning habitat and location (i.e. GPS, habitat type, and depth of spawning), settlement habitat type, Pelagic Larval Duration (PLD) and/or competency period, gamete buoyancy and/or larval behavior, seasonality, lunar phase, and frequency, as well as the larval behavior of the target organisms. PLD will determine the total integration time of individual trajectories. Since vertical motion is expected to play an important

role in larval dispersal, the depth at which gametes (e.g. eggs and sperm) are released will also be an important input parameter. Fertilized fish eggs are typically positively buoyant, but newly hatched larvae (ca. 24-48 h after fertilization) become less buoyant and larval density increases steadily before developing active mechanisms that influence their vertical and horizontal position in the water column. Tracking ensembles of virtual larvae over several spawning cycles will be necessary to estimate dispersal kernels or the probability of successful dispersal for a given species.

We expect that this activity will be concluded by September 2006. The final product of this activity will consist of connectivity matrices (probability of successful dispersal between reefs) of target species for which we have empirical biological information (e.g. early life histories traits, larval behavior, and demographics) and a report summarizing the results.

Sub-Activity 1.3.3 *Improved understanding of fish migration patterns and site fidelity on the MAR.*

Results Anticipated in FY06:

- Description of the migration patterns and site fidelity behavior of key Mutton Snapper in Belize.
- Assessment of vulnerability of species and individuals within or between reproductive periods;
- Application of findings to the design and effectiveness of MPAs in protecting individuals throughout reproductive season.

The MAR Program developed a contract with Dr. Kevin Rhodes for the expected results under this sub-activity. Two separate attempts were made in April and June 2006 to tag mutton snapper, *Lutjanus analis*, at Gladden Spit using internal acoustic tags. The results of the tagging ventures were the implantation of acoustic tags in six individuals that included four females and two individuals of undetermined sex. Various methods were employed to improve success for tagging the species, including the use of anesthesia, air bladder deflation, gill irrigation, underwater cages for recovery both prior to and following tagging, slow retrieval following catch, immediate release following tagging and shallow water fishing to reduce barotrauma. None of the procedures resulted in an increase in success rate for the approximately 15 individuals attempted out of the more than 100 individuals captured. Capture of the species in both shallow (20 m) and deep (40 m) water resulted in varying degrees of barotrauma—mostly irreversible—apparent as raised scales, ejected stomach or rapid death.

In short, the species is not a preferable candidate for external or internal acoustic tagging and future attempts to tag mutton snapper should be discouraged until other methods to greatly reduce barotrauma and increase survival, such as trapping, are introduced. Preferably, other more robust target species should be attempted prior to further attempts on mutton snapper.

Future steps in this sub-activity include the exploration of other SPAG species such as Nassau grouper for acoustic tagging. This will likely take place over the first quarter of 2007.

Objective 2: Help local partners improve the management and effectiveness of three platform MPAs strategically selected within the MAR network.

Activity 2.1: *Implementation of agreed common management effectiveness framework, and establishment of baseline status for the platform sites. Identify common issues of interest for multi-site strategies.*

Results Anticipated in FY06:

- Implementation of management effectiveness monitoring protocol within some or all of the 11 Belize MPAs managed by the government (Fisheries Dept.) and other NGOs (FON, Belize Audubon, etc.)
- Identification of management effectiveness strategies to be implemented in MPAs in the region.

Several attempts were made to engage the Government of Belize to participate in a rapid management effectiveness assessment of the Belize Marine Protected areas. The Belize Fisheries Department indicated that they do not agree with the terms of reference for the proposed management effectiveness assessment. They further indicated that such an approach would not work for protected areas management evaluation in Belize. The Fisheries Department's approach called for a six-month process of management effectiveness monitoring involving both field measurements and stakeholder consultation, as opposed to the three day workshop the MAR Program was proposing. Finally, the Belize Fisheries Department indicated that the official monitoring tool should be the National Protected Areas System Plan method and not the PROARCA / MBRS monitoring method.

In view of this situation, and taking advantage of a similar initiative by WWF in Belize and the MAR Region, we plan on using reports on previous management effectiveness evaluations conducted in the MAR which will then be "translated" into the PROARCA / SAM terminology for the regional report.

During the II Protected Areas Congress organized in Panama City during the month of April, WWF organized a side event to discuss the different management effectiveness monitoring tools that are being used in the Mesoamerican Reef Region. Different organizations and government authorities from the region participated, including TNC. At the conclusion of the meeting an agreement to use the TNC / MBRS monitoring tool was reached.

Furthermore, MAR Program and PROARCA/APM jointly sponsored the development of a management effectiveness consultancy in the region. The main purpose of this work was to produce, among other things, a Mesoamerican Reef scale analysis on management effectiveness. Among the main general recommendations resulting from the development of this report, we can mention the following:

- Actors from Mexico, Guatemala, and Honduras have manifested that current management effectiveness evaluations are not followed up on appropriately and that the applications of the tool as a guiding framework for decision making are not considered.

- The application of the Management Effectiveness tool should be included as part as the co-management agreements signed between the Governments and the NGOs in charge of a specific protected area. This way, the process will not be seen solely as the responsibility of the Government, but as a joint effort.
- It is relevant to disseminate the tool and its valuable applications for it are not well-known and therefore not used as it should.

Activity 2.2: *Socio-economic modeling and monitoring for the three platform sites*

Results Anticipated in FY06:

- Socio-economic dynamic predictive model for each platform site developed.
- Training modules developed and implemented for site managers in each platform site on the socio-economic and ecological indicators framework and predictive model and for the socio-economic monitoring system.

The terms of reference were prepared and the consultant was hired in November 2005. The consultant visited all three sites and interviewed more than 25 organizations to gather information and develop the socio-economic variables. As a result, both biological and socioeconomic models were prepared for all three platform sites. Models were put on Stella software and tested. A final draft was submitted to TNC MAR Program June 2006. Three workshops, one per platform site, will be carried out in September 2006 to train partners in the use of the software and the models. The utility of the models will be as a tool for resource managers to predict the impact of certain management interventions such as increases in the no-take zone, implementation of new tourism activities, etc.

Activity 2.3: *Improve the management of Gladden Spit MPA*

Sub-Activity 2.3.1 Support implementation of priority activities identified with enhanced Five-S framework.

Results Anticipated in FY06:

- Strategies to address conservation in surrounding areas of Gladden Spit Marine Reserve have been identified and validated.

This activity was delayed due to the institutional changes that occurred in Friends of Nature. For example, the staff responsible for this activity left the organization. For that reason and considering the importance of doing this exercise, we have agreed with FoN to carry this activity forward and implement it in FY07.

Sub-Activity 2.3.2 Revision of strategic plan and implementation of organizational sustainability strategies for Friends of Nature.

Results Anticipated in FY06:

- An updated strategic plan for FON approved by their Board of Directors.
- Implementation plan for executing recommendations of the updated strategic plan developed.

A strategic plan was prepared by TNC's Andy Drumm, mainly focused on financial sustainability and entrance fee determination based on whale shark observation. Unfortunately, the implementation plan was stopped by the Government of Belize Fisheries Department which decreed a fixed entrance fee for all the marine reserves in the country. Further work will be done in FY07 to demonstrate to the Fisheries Department the value of considering reviewing this policy and promoting the reinvestment of these resources directly into MPA management.

Sub-Activity 2.3.3 Implement an MPA and SPAGs education program to promote community support for MPA management in Belize.

Results Anticipated in FY06:

- Implementation of MPA and SPAGs education program among local communities and fishermen.
- Dissemination of the results of community meetings to all stakeholders.

The Belize Spawning Aggregation Working Group members have undertaken several efforts to expand the level of information shared with local communities, specifically focusing on spawning aggregations and marine protected areas. A five minute video informing the general public on the importance of protecting Nassau grouper and multi-species aggregations was aired on the national TV stations in Belize for five days during December through March, which are the months when Nassau grouper capture is prohibited by Law. An annual news letter produced by the SPAGS working group with all the data collected from the monitoring of Nassau groupers is also made available to local communities and the general public through the fishermen cooperatives, local leaders and during communities meetings being held by any member of the SPAG working group. A pamphlet on the biology, conservation and management of Nassau grouper in Belize was also produced by the Fisheries Department and WCS with support from members of the SPAG working group.

Activity 2.4: *Improve the management of Cayos Cochinos in Honduras.*

Sub-Activity 2.4.1 Implement recommendations from the management effectiveness report

Results Anticipated in FY06:

- Implementation of the plan designed and put in practice to address findings from the management effectiveness report.

The management effectiveness monitoring using the manual developed by MBRS-PROARCA-TNC-USAID is ongoing. A meeting between TNC, WWF, and other organizations was conducted in Panama City in April 2006. Discussions on the protocols used to apply the tool in the Mesoamerican Reef took place. As a result, the organizations present agreed to apply the manual mentioned above.

Key recommendations of the report have been implemented, these are:

SOCIOECONOMIC ASPECTS

1) Prepare a communications strategy that allows the incorporation of the local communities in information generation and exchange.

Progress: The communications strategy has been prepared during the months of June/July with support from AVINA and MARVIVA.

2) Emphasize the participation of local communities and industrial fishermen in environmental awareness activities.

Progress: During the month of February, prior to the closed season, an intensive awareness campaign was organized, developed and directed to local actors from Cayos Cochinos and its area of influence, with the purpose to emphasize the importance of this norm. Between March and June, HCRF, together with the Honduran Fisheries Departmente (DIGEPESCA), initiated a process through which more than 100 fishermen obtained their fishing licenses. Several communities were visited to create awareness about the importance of obtaining and maintaining the licenses.

3) HCRF shall prepare a work plan in joint collaboration with DIGEPESCA and the Environment Fiscally with the purpose of improving patrolling activities and complying with the different terrestrial resources, fisheries, and tourism use norms.

Progress: A work plan has been prepared with DIGEPESCA. As a result of this joint planning, DIGEPESCA has assigned a fisheries inspector specifically for the Cayos Cochinos Marine Natural Monument. Joint patrols are organized and developed to reinforce local knowledge about laws and regulations. Initial conversations have taken place with Environment Fiscally. Guards from HCRF have visited the Environment Fiscally offices and Roatán and a follow-up meeting is still pending.

4) Establish an information center for visitors.

Progress: The visitors' center has been built in Cayo Menor. HCRF is currently working on the design and preparation of the information materials.

GOVERNANCE ASPECTS

1) To prepare a plan that will guide fundraising activities to obtain sufficient resources for the complete implementation of the Management Plan. The plan should include the definition of an entrance fee.

Progress: The plan itself has not been prepared. Nonetheless, the entrance fee has been defined and is being used.

2) Prepare an institutional strengthening plan that includes the hiring of personnel for the areas of public use and monitoring, as well as working with local volunteers.

Progress: A plan itself has not been formulated but several official internal communications have taken place between the Executive and the Science and Management Director. The communications refer to the definition of the job descriptions for positions such as Public Use Program Coordinator that would also be in charge of investigation, monitoring, tourism and interpretation activities. Another guard will also be hired.

3) Include in the current annual work plan, a specific section for environmental education activities.

Progress: This is being done with the help of a volunteer student from the Honduran Technological University (UTH). She is currently structuring the environmental education plan to be implemented in the Cayos Cochinos School, as well as in three schools of three coastal communities.

5) Prepare a proposal for the active participation of key actors in the development of actions directed to the promotion of the different services the protected area provides, in the implementation of the management plan, and in the formation of strategic alliances for attending critical management topics (norms and regulations, industrial fishing, watershed management, etc.).

Progress: HCRF understands this means more involvement of the communities in tourism activities. To date, HCRF has managed to arrange that all participants of Operation Wallacea reach Cayos Cochinos via the communities of Nueva Armenia and Río Esteban. This translates into having them pay for one night stay, dinner and breakfast. They also use local transportation to reach Cayos Cochinos. They do the same on their way back home. HCRF has estimated that a total of \$12,000 is being generated as income for the community through these activities (during the entire Operation Wallacea period).

Additionally, a Peace Corps volunteer is helping build minor tourism infrastructure (two rooms and a small restaurant in the community of East End.)

6) Prepare a plan for the improvement of the protected areas' protection, tourism, and management infrastructure (Public use, replacement of damaged equipment, installation of buoys for the demarcation of critical zones, etc.).

Progress: The southern border of the protected area has been demarcated with buoys. No fishing zones along the entire area have also been demarcated. In the terrestrial portion of Cayos, signs containing information about the regulations of the park have been posted in strategic locations.

BIOPHYSICAL ASPECTS

1) In the short term, a plan to measure ecological integrity must be elaborated and implemented. HCRF mentioned that the recommendation that came out during the use of this management effectiveness tool was the need to analyze all the data that to date has been collected. One of the duties the person in charge of the investigation and monitoring activities will have, is precisely this.

Sub-Activity 2.4.2

Provide alternatives to the lobster fisheries by introducing new environmentally friendly techniques

Results Anticipated in FY06:

- Implementation of pilot projects in the MAR region to demonstrate advantages of adopting new practices for lobster fishing.

After a selection process of the environmentally friendly techniques to be used, a decision was made to visit Punta Allen in Mexico where the “casitas cubanas” are being used by TNC local partner Sian Kaan Biosphere Reserve. Six local fishermen, which were accompanied by HCRFs

Science and Management Director, were selected to participate in a five-day exchange that took place between June 19 and 23, 2006. During the time shared between fishermen from Cayos Cochinos and Sian Kaan, both groups detailed their expectations of the exchange as well as the different fishing activities they developed. The Mexican fishermen also shared their experiences in the formation of the Fishing Cooperative, as well as the sport fishing and ecotourism activities they have organized as complementary sources of income. Fishermen not only shared their experiences verbally, but also practically. They visited fishing sites and had the opportunity to see the “casitas cubanas” first hand in the field.

The MAR Program team has been in touch with HCRF with respect to the use of this lobster fishing technique. Program staff has provided contacts with experts on the use of this method in order to be able to better guide this activity to ensure its effectiveness by making them aware of the pros and cons of the “casitas cubanas”. This way, HCRF and local fishermen, can fully understand how this can truly contribute to the sustainable management of the lobster and reduce the conflicts among fishermen.

Sub-Activity 2.4.3 Train Cayos Cochinos Foundation staff in the 5-S Framework

Results Anticipated in FY06:

- Implementation of 5-S framework in Cayos Cochinos Foundation

Adoni Cubas, Science and Management Director of HCRF, was trained in the methodology during the week of 21 August 2006 in San Pedro Sula, Honduras. As a result, HCRF is considering using the Conservation Area Planning Tool as a methodology to revise the official site management plan.

Sub-Activity 2.4.4 Demarcation of the southern boundaries of the MPA and evaluation of the use of buoys as fish aggregation devices

Results Anticipated in FY06:

- Installation of ten buoys for the demarcation of the southern limits of the Cayos Cochinos Natural Monument.
- Reduction of the illegal fishing activities within the Cayos Cochinos Natural Monument.
- Evaluation of the use of buoys as fish aggregation devices and their ability to reduce pressure on the fish stocks inside the protected area.

Ten buoys have been installed at strategic locations. After analyzing different designs, a total of eight fish aggregation devices (FADs) have been installed in the southern part of the protected area. The FADs are being monitored once a month to determine their effectiveness. Currently, different fish species in their juvenile stages have been observed and artisan fishermen have been seen fishing nearby.

Illegal fishing activities have been reduced. As an example, a very well known illegal fisherman has been caught fishing outside of the protected area, just beyond the southern border where the bouys have been installed. HCRF is currently documenting the findings during their patrols and will be able to show, in a few months or so, any measured reduction in illegal fishing activities.

Sub-Activity 2.4.5

Promote best tourism practices in Cayo Cochin MPA

Results Anticipated in FY06:

- Information materials regarding the “Without A Trace” policy are distributed within the tourism sector of the protected area.
- Establishment of an information Center in Cayo Menor to provide information to the visitors regarding the “Without A Trace” policy and other rules and regulations within the protected area.
- Revisions made to the Management Plan, if necessary, regarding the limit of acceptable impact caused by tourism activities in Cayos Cochin.

To ensure that visitors and tour operators gain a better understanding of the “Without a Trace Policy”, and its application in the protected area, an information center has been established in Cayo Menor, Cayos Cochin. Materials referencing the policy are now available in both English and Spanish. The banners are located in the information center. Additionally, an expert on the topic has been hired to evaluate the impact of tourism activities in Cayos according to the limit of acceptable changes.

Sub-Activity 2.4.6

Identify potential sustainable finance mechanisms

Results Anticipated in FY06:

- Financial mechanism identified and an implementation plan elaborated.

There is official agreement between TNC and HCRF to conduct a consultancy to identify potential sustainable financial mechanisms. We expect to initiate this work during the month of September 2006.

Activity 2.5:

Improve the management of Sian Ka'an Reserve, Mexico

Sub-Activity 2.5.1

Develop measures of success for the remaining conservation targets in Sian Ka'an

Results Anticipated in FY06

- Monitoring Plan for Sian Ka'an completed.
- 5-S Excel worksheet updated with information on key ecological attributes, threats, strategies and indicators.

ASK expressed their desire to hire an in-house site conservation planner to carry out this and other conservation planning activities. Unfortunately, an adequate person has yet to be identified. Lack of additional funding to sustain this position in the long-term has also complicated the hiring process. ASK and TNC recognize the importance of developing

measures of success for Sian Ka'an. For this reason, the partners would like to move this activity to FY07.

Sub-Activity 2.5.2 Support the implementation of the land use zoning planning (OET) to control development densities along the beaches and dunes of Sian Ka'an.

Results Anticipated in FY06

- All new Environmental Impact Statements and official responses reviewed.
- Violations reported to the appropriate authorities.
- Long term monitoring plan completed.

A land use zoning plan (OET) coordinator for Sian Ka'an was hired by CONANP to ensure adequate implementation of the OET. Duties of the coordinator included the review of Environmental Impact Statements submitted by private land owners, review of official responses issued by the authorities, on site monitoring to ensure that all new constructions in the Reserve abide by the OET, and reporting violations to the authorities.

During the year, the coordinator reviewed all the Environmental Impact Statements submitted by private land owners and made recommendations to the Ministry of Environment (SEMARNAT) regarding viable projects. The coordinator also monitored all new constructions to ensure that they abide by the OET and reported any violations to PROFEPA, Mexico's Environmental Protection Agency. (PROFEPA).

Sub-Activity 2.5.3 Improve MPA management effectiveness in Sian Ka'an

Results Anticipated in FY06

- Recommendations and specific prioritized activities that need to be done in order to improve the management of the Sian Ka'an Biosphere Reserve.

A two to three day meeting with all Sian Ka'an staff was held in September 2006. Staff will have the opportunity to review and evaluate a series of socio-economic, governance and biophysical indicators in order to assess the management effectiveness of the Reserve.

Sub-Activity 2.5.4 Support the implementation of Sian Ka'an's public use program

Results Anticipated in FY06

- Reduced violations and negative impacts on the ecosystem generated by tourism activities in the Sian Ka'an reserve.

Subaward with ASK was signed and funds for this activity were transferred to partner in February 2006. The Sian Ka'an reserve is currently waiting for signs to be delivered by contractor. Signs will be installed in September 2006.

Objective 3: Establish a “virtual” Learning Center that convenes training courses, promotes exchanges, and facilitates coordination among the four MAR countries.

Activity 3.1: *Complete the development of a conceptual and administrative framework for the Learning Center.*

Results Anticipated in FY06:

- Learning Center framework completed.
- Formal agreements for sharing of information and development of self-training modules established.
- At least five self-training modules developed.

The Learning Center concept was developed after analysis of the training needs assessment and in consultation with experts who highly appraised it. Agreements were established with TNC-ITS Technology Training Dept. for developing the modules. Three tentative training modules are in the pipeline: gender equity, park rangers, training the trainers for MPA management. More modules will be selected soon.

- Tec Monterrey distance learning Social Leaders Program course “Conservation Strategy and Techniques” (scheduled to start next February) targeted for training selected local decision makers (via scholarship granting)
- Virtual library public access materials (publications training tools) to be posted on MAR webpage by late September. Production of summaries of training tools to be negotiated with authors.
- Webpage expanded with additional tools (ftp sites, etc.).
- Communication with MAR team and the region enhanced via listservers (CaMPAM, GCFI)

Presentation on the MAR results will be presented to the fisheries and conservation community at the next GCFI Annual Meeting, the most popular forum of its kind in the Caribbean region. TNC will sponsor the Reef Fish Spawning Aggregations session.

Additionally, a workshop for sharing experiences among conservation scientists and practitioners in Mexico, Belize and Honduras as well as preparing regional guidelines for whale shark observation tourism industry will be held in late September. Modular courses have been preliminarily identified and will be developed (on gender equity, MPA rangers, etc.) and used in different ways (downloadable from webpage for self-training or for the use of instructors at traditional courses).

Activity 3.2: *Provide fishers and other community members currently engaged in unsustainable uses of marine resources with appropriate training that will enable them to obtain employment in alternative, sustainable livelihood activities.*

Sub-Activity 3.2.1 Evaluate results to date of fishers training program

Results Anticipated in FY06:

- An evaluation of the TNC and others fishers training program is completed.
- Identified successful alternative trainings incorporated into Learning Center.

The evaluation was completed by a consultant (McPherson, M. “Livelihood transitions: towards sustainable fishing communities in the MAR region”, April, 2006, 107pp) based on the compilation and analysis of published and anecdotal information (collected via interviews) in dozens of sites in the four countries. The assessment showed the following: The goal of reducing fishing pressure while increasing the living standards of fishing communities has been met. In areas with higher demand, some increase in earning was achieved, but employment success has been better for non-fishers and part-time fishers with previous tourism experience than on full/part-time fishers. Knowledge transfer is not enough for promoting significant transition. These results will help design future training efforts to make sure courses drive real transition. See below on potential courses.

Sub-Activity 3.2.2 Development of an alternative livelihoods agenda for the MAR region.

Results Anticipated in FY06:

- Comprehensive agenda for the Learning Center’s community livelihood training program completed.

A tentative five-year agenda was proposed for preparing the coastal communities to transition to more sustainable, environmentally friendly economic activities, i.e., 1) practical courses with local tourism stakeholders and leaders to develop cultural-heritage products and attractions and 2) visitation exchanges to broaden local communities (Hopkins, Monkey River, Estero Lagarto, punta Manabique, Sta. Isabel, Chachaguato, Nueva Armenia, Rio Esteban, East End); 3) training in home-based production of handcrafts (in P. Herrero, Punta Manabique, MonkeyRiver, Chachaguato, Nnueva Armenia, Rop Esteban, East End); 4) complementary training for fishing guides (Belize); 5) training on marketing and sales techniques in P. Herrero, Hopkins, Monkey River, Punta Manabique, Cayos Cochinos; and business management and 6) enhancing skills such as carpentry, masonry, engine and boat repair (for all sites). This agenda is phased to be implemented over the next 5 years.

Activity 3.3: *Train MPA managers and planners from partner organizations to apply resilience principles to MPA design and management.*

Sub-Activity 3.3.1 Introduction of TNC Resilience Model to reef practitioners in the MAR region.

Results Anticipated in FY06:

- At least 60 professionals and practitioners trained in the Coral Reef Resilience Toolkit and applying its concepts in their country's MPAs.

This activity was not implemented this year and will take place in FY07 due the lack of agreement by the Resilience working group on the approach proposed to be implemented in the Caribbean. Instead, we organized a meeting in the region with the World Wide Reef Resilience working group, members of the Advisory group and TNC partners in the region. The meeting held in Cayos Cochinos, Honduras allowed us to establish the main drivers for resilience in the Caribbean region, in particular considering herbivory as one of the most important. The MAR team developed two internal discussions under the leadership of the MAR Marine Conservation Specialist in order to set a strategy to implement this activity during the next fiscal year.

However, the goal of 60 professionals trained is not feasible. A more realistic number is 15 to 20 people trained in the Reef Resilience tool kit.

Sub-Activity 3.3.2 Symposium of MPA Management and Resilience Model at the Meso-American Society of Conservation Biology Congress.

Results Anticipated in FY06:

- Incorporation of resilience principles in MPA management in the region.
- Promote participation of at least 50 professionals in symposium.
- A better understanding of the importance of resilience in the region.

TNC organized two major events during this fiscal year to promote MPA conservation in the MAR Region:

- The MPA session on the Mesoamerican Society for Conservation Biology (about 55 participants) in November 2005.
- The II Mesoamerican Congress on Protected Areas, organized by CCAD and ANAM (more that 300 participants) in April 2006.

The occurrence of these two events is considered a major achievement since it is the first time that Mesoamerican organizations held symposiums on these specific topics.

For both activities, symposium reports and final resolutions were produced. They provided a good framework to support important marine conservation concepts such as:

- MPA networks as a valuable tool to develop;
- The promotion of resilience in protected areas systems and networks;
- The need to increase work in marine conservation and close the representational gaps for MPAs in national protected areas systems in Mesoamerica;
- Economic sustainability in MPAs;

- The promotion of the conservation and appropriate incorporation of new protected areas in order to ensure conservation of key biological processes like spawning aggregations and nursery habitats.

Activity 3.4: *Bringing the gender approach to the MAR region.*

Results Anticipated in FY06:

- At least 30 professionals trained in the region in applying the gender approach in MPA management.
- At least three cooperative agreements signed with requirements to develop analysis with gender approach.

TNC signed an MOU with the IUCN social team to get support for regional training on gender equity in marine protected areas. As a result, 16 persons from the region were trained in Cayos Cochinos in April. As a result of this training, IUCN, TNC and other partners agreed on developing follow-up activities, the most important ones were:

1. Local training in each country. To date, 12 professionals from Guatemala participated in local gender equity training for Guatemalan officials in both government and NGOs with formal support from CONANP. CONANP has also requested support to do a similar activity in Mexico.
2. TNC and IUCN, based on the results of the regional training, prepared and signed a contract to conduct two major tasks:
 - Prepare a draft training tool for gender equity in MPAs and incorporate in the Learning Center.
 - Prepare guidelines on how to apply the gender equity approach in programs or other institutional operations within the MAR region.

Objective 4: **A MAR ecoregional plan is adopted and implemented that reflects agreement by key conservation partners (local and international NGOs, government agencies and donors) on priority programs and activities, with the sharing of scientific and program data;**

Activity 4.1: *Development of a conservation blueprint for the MAR region using relevant existing information and incorporating the resilience model.*

Sub-Activity 4.1.1 *Conservation targets and viability development.*

Results Anticipated in FY06:

- Conservation targets developed for the MAR ecoregion.
- A viability analysis of each of the conservation targets (condition, size and context) will be conducted.

The MAR ecoregional plan/assessment is well on its way. With the attendance of more than 35 persons, an expert workshop took place in Antigua, Guatemala from 30 May to 1 June 2006 as part of the Mesoamerican Reef (MAR) ecoregional assessment process. During this activity, the

participants had the opportunity to express their points of view and to discuss with colleagues from the four Mesoamerican Reef countries topics such as ecoregional boundaries and stratification, priority conservation targets and to assign conservation goals for each of the identified targets. As part of this workshop, a presentation was given by World Wildlife Fund on the MAR ecoregional plan developed in 2002 which serves as the basis for the current ecoregional planning exercise. Also, presentations on the Carolinian ecoregional plan and on Conservation by Design were delivered at the workshop. A planning team was also formed which will have the task of developing a portfolio of priority conservation sites.

The conservation targets identified by the workshop participants include, among others, coral reefs, mangroves, estuaries, reef fish spawning aggregation sites, marine turtle nesting beaches, manatee habitat and sea grasses. These conservation targets were identified through a participatory process during which conservation goals were also set.

Sub-Activity 4.1.2 Threats sources identified and stakeholder analysis for the development of conservation strategies.

Results Anticipated in FY06:

- Threat sources identified for the MAR ecoregion.
- Conservation strategies developed through a process of stakeholder analysis.

As part of the workshop listed in activity 4.1.1, the participants devoted the last day to review the main threats to conservation and to the ecosystem services the Mesoamerican Reef resources provide. The main threats identified by the participants included coastal development, land based sources of pollution including agriculture and animal husbandry, and marine sources of pollution such as maritime and port activities, over-fishing, aquaculture and unsustainable tourism.

Development strategies for these threats were developed during the second workshop held 5-7 September 2006 in San Pedro Sula, Honduras.

Sub-Activity 4.1.3 Use a decision-making tool (such as MARXAN) to assemble updated optimal portfolio of sites using spatially described threats, targets and goals.

Results Anticipated in FY06

- Selection of conservation planning units finalized.
- A number of ecological, social and economic criteria selected for decision tool analysis.
- Portfolio of conservation sites that meets the selected criteria developed.

Conservation planning units were selected during the first workshop. All criteria for decision tool analysis were also selected.

This first workshop was part of a series of activities leading to the development of an ecoregional assessment that involves several workshops and planning activities at the regional level. Follow-up activities included a second workshop during which the portfolio of priority sites developed

by the planning team were reviewed and validated and strategies for the implementation of the portfolio and for engaging the main conservation threats were developed. A second workshop took place 5-7 September 2006 in San Pedro Sula, Honduras.

Sub-Activity 4.1.4 Validation of identified conservation portfolio through stakeholder participation.

Results Anticipated in FY06:

- Results are validated and agreed upon by peers.
- If a consensus is reached, then the portfolio will be presented to the Tulum agreement governments for its advancement as a network of marine protected areas.

This will be the last part of the ecoregional assessment process whereby TNC will try to gain political support from the MAR country governments. We expect to implement this sub-activity by November 2006.

The Tulum agreement was signed in June 2006. In that document, the governments directed CCAD to develop the MBRS action plan. We will provide CCAD with the results from the MAR ERA so that its findings can be incorporated and used for the MBRS action plan.

Activity 4.2: *Implementation of consultations with Community leaders and local government authorities in the MAR region to consolidate conclusions and to present them to the Tulum+8 steering committee for inclusion in the new MAR System Action Plan*

Results Anticipated in FY06:

- Develop the consultation process in each country in the MAR region
- Report per country, with analysis about the current Tulum Action Plan.
- Reports and recommendations for Tulum+8 based on individual consultation processes.
- Specific recommendations for the new action plan.

TNC organized national consultations with community local government leaders in each of the MAR countries during the months of November and January, incorporating 18 participants in Belize, 32 in Guatemala, 20 in Mexico and 18 in Honduras. We also organized a regional workshop in the Mesoamerican reef region with 26 participants from the four countries.

During these consultations, participants took the opportunity to review the 1999 Mesoamerican Reef Action Plan, the draft declarations prepared for MBRS and the Belize Foreign Affairs minister and the results from the consultations in Cancun and Tegucigalpa drafted by Arsenio Rodriguez (Tulum+8 Coordinator). Each group prepared, with assistance from the MAR Program, a report from their meetings with specific recommendations to incorporate in both the presidential draft declaration and the proposed draft action plan. Unfortunately, we had no success in getting the recommendations incorporated, even after several attempts. TNC MAR program is now negotiating with CCAD and the International Support Committee to ensure the

incorporation of these results in a new, more inclusive process to prepare a new draft for the Mesoamerican Reef Action Plan.

More recently, the MAR program took leadership in putting together the Tulum+8 International Steering Committee to review and redirect this work in order to ensure the finalization of the Tulum+8 action plan. This process has often been difficult and time consuming, particularly due to the reactions of some organizations such as MBRS. A number of agreements were made during the meeting organized last August in Miami, with active and constructive participation of USAID. A committee composed of TNC, WWF, CI and MBRS was organized to complete the document.

After the above process and through a separate initiative, TNC is discussing with key actors the possibility of organizing an Alliance for the Mesoamerican Reef as a nongovernmental initiative to promote coordination within the MAR region.