Biodiversity Conservation at the Landscape Scale

A Program of the Wildlife Conservation Society Supported by the USAID/EGAT Global Conservation Program

Glover's Reef Living Seascape: Safeguarding Marine Resources and Rural Livelihoods in Belize

Implementation Plan FY2006
October 2005 – September 2006

Project Goal
To ensure conservation of biological diversity in regions of global biodiversity importance, using a species-based landscape or seascape approach.

The Wildlife Conservation Society believes that protected areas must remain at the core of all nations' biodiversity conservation plans. These areas typically contain a higher diversity and abundance of plants and animals than landscapes or seascapes managed primarily for economic use. Yet, parks and reserves are always embedded in larger, human-dominated landscapes or seascapes and are seldom sacrosanct. Regardless of how large or small a protected area may be, the plants and animals it contains are often threatened either directly or indirectly by human resource use activities.

Management of parks and reserves cannot, therefore, occur in isolation from the surrounding human-dominated landscape or seascape, but must take into account where and how human activities conflict with biodiversity conservation, and where conservation adversely impacts human welfare. As human populations continue to expand over the next 50 years, the incentive for over-exploiting natural resources within and outside of protected areas will likely increase and the need for biodiversity conservation tools that address human-wildlife conflict will become even more important.

The Living Landscapes Program promotes conservation of landscapes or seascapes by focusing efforts on key animal species that require large areas for their conservation, are particularly at risk because they cross land use and jurisdictional borders, and when protected will have the greatest positive impact on biodiversity as a whole. These landscape or seascape species are highly mobile, vulnerable animal species, and their conservation fosters a focused and cost-effective way to retain a full complement of biodiversity and overall ecological integrity. To conserve these species, parks and reserves must be integrated into the broader landscape or seascape, a landscape or seascape in which people exploit natural areas and wild species to meet their socio-economic needs.

The BCLS Program is designed to ensure biodiversity conservation in four core sites by identifying actions to conserve landscape or seascape species, and by increasing the capacity of local and national institutions to implement such actions. The four areas of global biodiversity importance for current WCS involvement and USAID activity are:

- Northwestern Bolivian Andes Landscape Conservation Area (Bolivia)
- Glover's Reef Living Seascape (Belize)
- Maya Biosphere Reserve Living Landscape (Guatemala)
- The Eastern Steppe Living Landscape (Mongolia)

The Glover's Reef Living Seascape Project

Goal: To conserve the outstanding biodiversity and natural beauty of Glover's Reef and, by synthesizing and disseminating lessons learned, promote the sustainable use of its marine resources through the adoption of best practices within WCS and throughout the conservation community.

Glover's Reef, Belize is one of six globally significant landscapes or seascapes included in WCS' overall GCPI & GCPII/USAID portfolio of conservation sites, and the first coral reef site to be adopted under the WCS Living Landscapes program. This program seeks to develop and test wildlife-focused strategies that will identify and resolve conflicts between people and wildlife that threaten important wild places and the biodiversity they support. The approach is threats-based and highly participatory.

Although Glover's Reef Atoll has been established as a marine reserve, the protected area needs to be integrated into the surrounding region – to be managed within the realities of the regional social and economic context - if it is to prevail within an increasingly human-impacted seascape, as many of the threats originate beyond the boundaries of the reserve. One major means of integration is ensuring that the socio-economic requirements of the various stakeholders are openly considered and addressed.

The Atoll supports extraordinarily high biological diversity and possesses the greatest range of reef types in the Caribbean Sea. Located 30 miles off the coast of Belize, the Atoll's well-developed spur and groove outer reef structure encircles a shallow lagoon that is dotted with more than 800 patch reefs. The shallow protected waters of the Atoll's lagoon provide nursery and feeding habitats for at least three species of sea turtles, eight species of sharks and rays, more than twenty species of aggregating reef fish, and numerous species of coral. The northeastern corner of the Atoll is the site of one of the Caribbean's largest and last remaining Nassau grouper spawning aggregations, a spectacular biological phenomenon with cultural and economic importance that is severely threatened across the Caribbean. The benthic community of corals and sponges on the western wall of Glover's is among the most diverse and densely covered sites reported anywhere in the Caribbean, exhibiting 95% living cover and as many as 11 species per square meter.

Given its biological and ecological importance, its distance from the mainland, and its relatively pristine condition when compared with other Caribbean reef sites, Glover's Reef Atoll has emerged as a priority for long-term conservation. The Atoll is the third largest marine reserve in Belize with an area of almost 36,000 hectares, and was declared a World Heritage Site in 1996. Despite its protected status, Glover's Reef Atoll is threatened by human activities, both on-site from over-fishing and inappropriate tourism development, as well as off-site from increased terrestrial run off due to deforestation that can lead to increased turbidity and nutrification, and the effects of global climate change such as increasing sea temperatures. In general, coral reefs flourish in clear water that allows sunlight to penetrate and provide the energy required for photosynthesis by the corals' symbiotic algae, promoting optimum coral growth. Waters high in nutrients often lead to overgrowth of macro algae on corals and an ultimate decline in coral cover and diversity. Corals are particularly susceptible to high sea temperatures, which cause many corals to 'bleach' or lose their symbiotic algae, often resulting in coral mortality. The Wildlife Conservation Society seeks to ensure the long-term conservation of this world-class site by identifying specific threats to the Atoll, building and strengthening alliances with stakeholders to support long-term conservation, and strategic implementation of conservation interventions.

Key threats to the Atoll's biodiversity identified through a preliminary analysis include the following:

- Unsustainable fishing
- Lack of alternative activities for fishermen
- Impacts of global climate change
- Nutrification and high turbidity of the Atoll's lagoon

- Lack of support for the marine reserve by some stakeholders
- Insufficient information available for strategic conservation management
- Lack of long-term financing.

The objectives of the Glover's Reef Living Seascape (GRLS) project, and proposed associated activities, are specifically geared towards reducing these threats through the development and implementation of a multi-partner strategy.

IMPLEMENTATION PLAN FY2006

OBJECTIVE 1: Develop and adopt a participatory strategy to reduce threats to marine life in the Glover's Reef Living Seascape

The final seascapes are presently being used to develop a Seascape Conservation Strategy for Glover's Reef that will focus on the priority interventions for reducing threats and will inform the process of adaptive management for the atoll.

Activity 1.1 Complete threats and stakeholder analyses through a series of focused meetings in consultation with the Glover's Reef Reserve Advisory Committee.

This activity was completed in FY04.

Activity 1.2 Create a "roadmap" for conservation intervention by completing a Seascape Species Analysis.

Draft conservation seascapes developed for queen conch, star coral and *Diadema* will be updated given the suggestions for improvement from the species experts and feedback received from the GRAC. For the remaining four seascape species (Nassau grouper, Caribbean reef shark, hawksbill turtle and osprey), the refined biological and human seascapes will be overlaid and conservation seascapes developed using the MARXAN software by the end of 2005.

Activity 1.3 Identify high priority interventions.

During the first quarter of FY06, the draft Conservation Strategy will be reviewed, refined, printed and distributed to the many stakeholders of the Atoll reserve. With the assistance of LLP staff we will hold a special workshop in Belize City to present the draft Strategy to the Glover's Reef Advisory Committee and local experts and to discuss ways in which the recommendations can be used in practical ways to strengthen management of the reserve. During this process, any adjustments to the priority interventions will also be made. Presently our interventions are aimed primarily at reducing indirect threats such as inadequate legislation, lack of alternative livelihoods for fishers, weak enforcement and management, lack of key management data, lack of support from stakeholders, insufficient planning and lack of general awareness.

It is expected that the Strategy will help guide future amendments to the reserve's management plan, indicating measures required to reduce threats to the protected area. During a MPA Management Effectiveness Workshop held in April 2005, the reserve manager and GRLS staff noted that the management plan is in need of revision and recommendations from the Strategy would therefore supply timely improvements to the new plan.

Over the course of the year, investigations will continue in an effort to fill the gaps in our knowledge of the causes and the severity of the threats identified. These will include continued monitoring of coral health and the predicted recovery of the spawning aggregation site on the northeast corner of the Atoll that was recently closed to fishing, and the further development of a spatial database of these monitoring and research efforts. We have

been recording, with the help of reserve staff, the number of cases of illegal fishing. Our socioeconomic survey revealed that most fishermen would not be considered to be in a state of poverty. Also, judging from the participation of the GRAC members at meetings and training sessions and of fishermen in the data collection program, there seems to be a growing participation of stakeholders in the management of the reserve.

Threats addressed and results/outputs anticipated:
The Conservation Strategy will be finalized, to include recommendations for changes in boundaries of management zones and for changes in some management practices and we have indications that recommended actions resulting from the analyses will be incorporated in the revision of the Glover's Reef Marine Reserve management plan. In this way management will be more closely focused on addressing the specific threats that have been identified during workshops and analyses.

Documented information on the effects of the spawning site closure that has been shared with the Advisory Committee and wider group of local experts will lead to improved technical capacity and enhanced motivation of the members. We expect that the well-informed members will share relevant information with their respective institutions and garner additional support for the site closure through better understanding of the rationale for the closure and the resulting benefits. This activity also addresses the threat of lack of information, by continuing to provide scientific data on which to base more targeted management actions.

OBJECTIVE 2: Develop and implement sustainable and adaptive mechanisms to strategically address threats across the seascape

Although the Glover's Reef Seascape Conservation Strategy has not yet been completed, we have initiated several priority actions that will contribute to achieving the conservation targets. These include monitoring of our seascape species, strengthening stakeholder support for the marine protected area, collecting key management data, conducting various aspects of training, providing technical support for management, and developing educational material.

During this implementation period, work on preparing and implementing development guidelines for sound tourism and residential use of the Atoll's cayes will be carried out in consultation with the Advisory Committee.

Technical support will continue to be provided the Fisheries Department, CZMAI, and NGOs in monitoring the status of the coral reefs, seascape species, water quality and general use of the Atoll. Working with the Glover's Reef Marine Reserve staff, revisions to the management plan and operational plans will be made in response to new information and the conservation strategy for the Glover's Seascape. For example, areas of the atoll that are resistant and resilient to coral bleaching are being identified and may lead to re-designing the zonation of the reserve to ensure that the Conservation Zone includes these areas. Training will continue to be provided for staff and Advisory Committee members in areas such as fisheries data collection and analysis, surveillance and enforcement techniques, group dynamics and project review and evaluation, and ecological monitoring methods.

Co-management arrangements are being explored, ranging from strengthening the capacity of the Glover's Reef Advisory Committee to assume more management responsibility, to special partnerships with stakeholder groups interested in implementing relevant aspects of the seascape conservation strategy.

To address the threat of unsustainable fishing, we plan to work in partnership with a local NGO to introduce alternative livelihood training for fishermen in Sarteneja in tour guiding and small business management. In 2006 we will also conduct a socioeconomic survey of fishermen to assess changes in their material style of life, and their attitudes and perceptions about the marine environment and the marine reserve. Baseline information on these parameters was collected in 2004.

Activity 2.1: Implement Seascape Conservation Strategy in cooperation with Glover's Reef Marine Reserve staff and Advisory Committee.

During the course of FY06 we will be implementing several key priority interventions identified during the process of developing the Conservation Strategy. During FY05 we had hoped to partner with UNDP's Small Grant Programme to provide some funds to a new NGO in Sarteneja for training in alternative livelihood activities for fishermen (Intervention 7[1]), which is one of our high priority actions to reduce the threat of over-fishing (Direct Threat 1). The local NGO, however, was experiencing problems and became inactive and so we have decided to partner with another Sarteneja NGO, SWEET (Sarteneja Wildlife, Environment and Ecotourism Team), which has been showing significant growth and vitality. We will continue to pursue the possibility of conducting the project with SWEET, which will include training for fishermen in tour guiding, including fly fishing, small business management, and capacity-building for the NGO. As we have during the last two seasons, we will hire at least two fishermen from Hopkins to assist with the monitoring of the Nassau grouper spawning site at Glover's in December/January, thus helping to offset some of their losses in foregoing fishing at this site. We will also continue our exchange program with the Belize Audubon Society (BAS), with GRLS staff assisting BAS with the monitoring of the spawning site at Lighthouse Reef Atoll, and BAS staff in turn helping with the monitoring of the Glover's Reef Atoll site.

We will continue to work closely with the National Spawning Aggregation Working Group as its secretariat. A Spawning Aggregation newsletter will be prepared in collaboration with the Working Group, working specifically with the CZM Authority & Institute, the Fisheries Department, and WWF (Intervention 9 to address Indirect Threat 10). The TV spot will also be updated and aired during the Nassau grouper spawning season (Intervention 9).

We will also engage a consultant to assist the CZM Authority & Institute, which is the formally appointed Data Manager under the Working Group's data sharing agreement, in analyzing the data in the SPAG database in an effort to keep the Working Group better informed of the results of the monitoring program (Intervention 1 to address Indirect Threat 4).

Furthermore, as mentioned below, other interventions include the collection of fish catch and effort data, preparing development guidelines for the atoll cayes, training activities, and monitoring of reefs and seascape species. Involvement of fishermen, GRAC members and reserve staff in these activities, and sharing the data with these groups, will also help in raising awareness through increased knowledge (addressing Indirect Threats 9 and 10).

Threats addressed and results/outputs anticipated:
Training of fishermen in Sarteneja in alternative livelihoods will help to reduce their dependence on fishing and at the same time help to reduce the unsustainably high fishing pressure - the largest threat to Glover's Reef. Educational and public awareness activities are geared towards informing users of the reserve of the relevant regulations, thus fostering compliance which will lead to conservation of many of the resources of the coral atoll. Having timely results of the data collection activities will aid in the process of adaptive management.

Activity 2.2: Provide technical support and training to the Glover's Reef Marine Reserve staff, the Belize Fisheries Department, and the CZMAI to improve management of the reserve and enforcement of fisheries and land-use regulations

[1] Please refer to Appendix 1for this and other numbered interventions or threats highlighted in the text that follows. This appendix details the general and seascape species specific conceptual models for the Glover's Reef Living Seascape showing the goal, conservations targets, the key threats militating against those targets and the strategic interventions that are being carried out to mitigate the threats. The conservations targets, threats (direct and indirect) and interventions are uniquely numbered and these numbers carry over between all four models.

Building on the training given in conflict resolution, leadership, conduct of meetings, co-management and project management, the Glover's Reef Advisory Committee will be offered training in group dynamics and program review and evaluation during the second and fourth quarters (Intervention 11). GRLS staff will organize the training workshops and a contracted national expert will facilitate the sessions.

Travel costs for members to attend the quarterly Committee meetings will continue to be covered. At least one of the meetings will be held on site at Glover's Reef to give the members the opportunity to observe reserve management firsthand. As Secretary of the Committee, WCS will continue to provide assistance to the Marine Reserve staff in arranging Advisory Committee meetings, and documenting and distributing the minutes of meetings. GRLS staff will also assist the reserve staff in revising the management plan, incorporating the recommendations of the Conservation Strategy and the MPA Management Effectiveness study (Intervention 13).

To address the threats of pollution from sewage discharge (Direct Threat 3) leading to nutrification (Direct Threat 2) and of habitat loss, a planning consultant will be hired during the third and fourth quarters to prepare development guidelines for the cayes of the atoll that are in keeping with the draft National Cayes Development Policy, the Dangriga Coastal Planning Region guidelines, and the National Coastal Zone Management Strategy (Intervention 17). This activity will be carried out in consultation with the Glover's Reef Advisory Committee and caye and resort owners, and will include guidelines on matters such as waste disposal and pollution control, building density and land use, coastal structures, vegetation clearance and sensitive habitats, etc. The consultant will also be required to assist in the design of educational material on topics such as the harmful effects of introducing exotic species, the impact of nutrient run-off on corals and the importance of appropriate sewage disposal, and relevant laws governing mangrove clearance, shorelines structures and the beach reserve (Intervention 9).

Threats addressed and results/outputs anticipated:
Enhanced involvement of the Advisory Committee members in the reserve's management, and improved level of attendance and participation at meetings, will help to ensure that management activities will be focused on reducing threats. The development guidelines prepared for the atoll cayes will help to guide future development and minimize the impacts of the current facilities – especially tourism infrastructure – on the atoll's marine environment.

Activity 2.3: Strengthen and expand stakeholder support for the Seascape Conservation Strategy – e.g. fishermen (divers for lobster, conch and finfish, as well as handline fishers), Atoll residents, and tourism operators, as well as mainland communities that are highly dependent on the health of the reef (Hopkins, Sarteneja and Dangriga).

The main activity for FY06 will be the continuation of the fisheries data collection program for the Atoll (Intervention 8, addressing Indirect Threat 4), which is providing information essential to demonstrating the benefits of reserve conservation. The fisheries catch data is presently collected on-site at Glover's Reef by a GRLS staff member who was formerly a fisherman and by a fisherman at the landing site on the beach at Hopkins. Fishermen are providing their data and are being compensated by fuel coupons that are redeemable at the fishing co-operatives in Belize City and a marina in Hopkins. These data are being complemented by catch data on conch and lobster being collected at the fishing co-operatives by the Fisheries Department. In turn, the data collected by GRLS staff are shared with the Fisheries Department and the CZMAI.

Morphometric data as well as catch data on lobster, conch and finfish (including species composition) are being collected. These data are also being used to determine the volume and proportion of catch that Nassau groupers comprise. Obtaining this information is essential prior to initiating discussions on introducing a ban on spear fishing in the reserve's General Use Zone. The catch and effort data will be used to show improved catches in or near the reserve over time, to document the impact of a marine reserve on fisheries production. This is urgently

needed to demonstrate to fishermen the positive benefits of marine reserves on their livelihoods. It will also supply vital data for a broader socio-economic survey that will be conducted to assess the value of the Atoll to the economy, and to justify the costs incurred for its protection.

During FY06 we will also be focusing on carrying out a preliminary analysis of the catch data and presenting the results to the Fisheries Department and fishermen at the end of the year.

During the first quarter of FY06 we will conduct a training session for fishermen in surveillance and enforcement to assist in reporting to authorities incidents of illegal fishing (Intervention 6). This will be carried out in partnership with the Fisheries Department, the Belize Fishermen Co-operative Association, and National Fishermen Co-operative. As part of a complementary project, selected fishermen will also be provided with radios to enable them to fully assist in the surveillance effort at Glover's Reef.

In the final quarter of FY06, a socioeconomic survey will be carried out in the fishing communities of Sarteneja, Dangriga and Hopkins, using the methodology developed by NOAA (Intervention 15 to address Indirect Threat 11). This method was used to conduct a survey in 2004 to collect baseline data. Therefore a second survey should supply information on changes over the past couple of years in their material style of life and their attitudes and perceptions with regard to the marine reserve. The results of the survey will be important in gauging the impact of the various programs that have been initiated such as the catch data collection, public awareness, and training in surveillance and enforcement.

Threats addressed and results/outputs anticipated: Involvement of fishermen in the catch data collection and in surveillance and enforcement is intended to enhance their sense of ownership of the reserve and their appreciation for its benefits, and thus increase their support for its continued protection. Lack of their support has been a major indirect threat, leading to illegal fishing. Over time, the benefits of the reserve to fisheries production should be demonstrated through the results of this monitoring. In addition, the data should help determine the sustainable level of fishing for the General Use Zone of the Atoll for the various commercial species. We will make recommendations to the Fisheries Department to enforce these levels of fishing.

Activity 2.4: Introduce innovative co-management arrangements with stakeholders to foster buy-in for conservation action.

As the government's moratorium on co-management agreements for protected areas is still in effect, and the National Protected Areas Policy and System Plan has not been finalized or adopted, our original plan to foster the interest of the Belize Audubon Society (BAS) in becoming a co-manager of the Glover's Reef Marine Reserve has had to be postponed. In the meantime, however, the capacity of this NGO to take on the responsibility of Glover's Reef has been questioned by the Fisheries Department. On the other hand, the Department has expressed interest in the Glover's Reef Advisory Committee (GRAC) becoming a co-manager partner, and we have therefore been working to encourage this process (Intervention 12).

During FY06 we will facilitate the continued strengthening of the GRAC through training, its quarterly meetings, and its visit to the reserve and collaboration with reserve staff, thus helping to prepare the Committee to assume more management responsibility. Training in group dynamics will assist the GRAC to become a more cohesive and effective Committee. Training in program review and evaluation will help members to become more analytical in assessing the work program for the reserve. This capacity-building is aimed at strengthening the ability of the GRAC to become a co-manager of the reserve in the future.

In relation to other informal co-management agreements, we plan to initiate a turtle nesting monitoring program with the residents of Long Caye and Northeast Caye during the nesting season that starts in May/June 2006 (Intervention 26). In addition, the moorings that have been donated by a hotel owner on Southwest Caye will be installed and monitored jointly by the donor and reserve staff (Intervention 25, to address the Direct Threat 6).

Threats addressed and results/outputs anticipated:
We expect that the increased level of responsibility of the Glover's Reef Advisory Committee in the management of the reserve will result in improved day-to-day implementation of activities that will reduce illegal fishing, increase support from stakeholders, and strengthen enforcement. This will lead to overall improvement in the level of protection of the reserve's resources and biodiversity. In addition, the initiation of turtle nest monitoring will help to supply basic data required to inform management (Indirect Threat 4). The installation of moorings will help to reduce the direct threat to coral from damage by boat anchors (Direct Threat 6).

Activity 2.5: Develop new, and strengthen ongoing sustainable long-term programs to track reef health (e.g. coral cover, algal abundance, and coral species diversity), water quality, and population status of commercially and ecologically important reef species (e.g. groupers, sharks, snappers) by Reserve staff and staff of key agencies such as the Fisheries Department, CZMAI, and other NGOs involved in reef management.

Each quarter during FY06 GRLS staff will work along with marine reserve staff to collect monitoring data on commercially fished species of lobster, conch and five finfish species, using the LAMP (Long-term Atoll Monitoring Program) monitoring protocol (Interventions 18 and 23). The four datasets will also be analyzed at the end of the year and the results, along with the results for the previous year, will be presented to the marine reserve staff, the Fisheries Department, the CZMAI and the Glover's Reef Advisory Committee. The data will be shared with the Fisheries Department and the Data Centre of the CZMAI.

Conch data collected will track the status of this seascape species over the remaining length of the project.

With the assistance of caye residents and reserve staff, we will monitor the nesting activity of turtles on the atoll cayes (Intervention 26). If we are successful in acquiring additional funds we will also initiate an in-water monitoring program for the hawksbill turtle, another of our seascape species. We will also initiate monitoring of osprey nests, mapping the location of nests with the use of a GPS (Intervention 27).

In addition, in collaboration with marine reserve staff, GRLS staff will continue to monitor the spawning aggregations of the Nassau grouper, a third seascape species (Intervention 1). Data collected by this monitoring during December 2005 – January 2006 will be placed in the national spawning aggregation database, which is shared by members of the National Spawning Aggregation Working Group.

Threats addressed and results/outputs anticipated:
Strengthened national capacity in monitoring environmental health and the status of commercial species will be accomplished through building a team of well-trained reserve staff. The data resulting from monitoring is critical to determining whether the status of the conservation targets is improving, and thus whether the investment in management and reduction of specific threats is worthwhile.

OBJECTIVE 3: Learn and teach best practices in the Glover's Reef Seascape and beyond.

During the first two years of the project important lessons have been learnt during the application of the threats assessment methodology, the seascape species selection process, building the conservation seascapes, and developing a monitoring framework. Aspects of these lessons have been included in several LLP Bulletins and Technical Manuals that are being shared as guides to others using this planning approach at landscapes or seascapes around the world.

To date we have documented lessons learnt in applying the Seascape Species Approach to a tropical marine site, shared our fisheries catch data collection methodology and LAMP monitoring protocol with local partners, and gained valuable experience in the participation of a stakeholder committee in reserve management.

As we implement the Conservation Strategy in the coming years, we expect that other best practices will be revealed in relation to the preparation of development guidelines for the small islands of the Atoll, the application of new types of partnerships and co-management arrangements, the role of no-take zones in promoting conservation while maintaining or increasing income for fishers, the importance of creating networks of marine reserves to enhance system resilience, and the introduction of innovative sustainable financing measures. The success of these practices will be monitored and shared with a wider audience within the country, the region and beyond.

Activity 3.1 Document the lessons learned from the application of the Living Landscapes approach to priority setting within a marine site.

The process of building human and biological seascapes, and the modeling process for developing the conservation seascapes for a marine system – and therefore conservation action priorities – has been and will be documented and contrasted to the process when applied to a terrestrial system. These lessons learnt will be shared during the next LLP annual meeting in late 2006, providing the opportunity to discuss and evaluate the lessons learned at other sites applying the Living Landscapes approach and provide a framework for comparison as the process is applied to a site such as Glover's Reef.

Activity 3.2 Extract and share best practices, in terms of management and monitoring.

Best practices regarding the monitoring of fish catch have been shared with our partners in the Fisheries Department, the Belize Audubon Society and the Belize Fishermen Co-operative Association. We expect that best practices will also be revealed in relation to our development guidelines for the Atoll's cayes. The experience of the Glover's Reef Advisory Committee in reserve management will also be documented and shared with the Fisheries Department and other similar Advisory Committees at the end of FY06.

Threats addressed and results/outputs anticipated:
Documentation of these best practices will be expanded and shared during the subsequent years of the project. We hope that the Fisheries Department will adopt this method and implement it at other sites. BAS will be implementing it at Lighthouse Reef, in collaboration with the fishermen from National Fishermen Co-operative.

OBJECTIVE 4: New York Coordination Unit Strategy: Guide the design and testing of wildlife-focused planning, implementation, and evaluation tools for effective conservation at a landscape scale, and promote learning across sites and beyond

The NY-based Coordination Unit (CU) of the program is designed to develop and test wildlife-based, landscape-scale approaches to biological conservation across multiple sites. To ensure the widespread utility of these new conservation approaches, the program is testing them within landscapes that encompass a diverse array of land-uses, resource-use issues, and jurisdictional arrangements. To develop new approaches, facilitate and harmonize testing and implementation among these core sites, and capture the synergistic benefits of diverse experiences, a central coordination unit is charged with designing and managing the program. This unit guides development of landscape-scale conservation strategies, tools and techniques; assists in the design and development of cost-effective intervention and monitoring programs at these sites; promotes cross-site learning; and ensures communication among the sites, WCS staff (central and field), USAID (DC and missions), and the larger conservation community.

The CU team consists of a program director, two landscape ecologists, an outreach/communications coordinator, socio-economic monitoring specialist, biological monitoring specialist, two geographic information systems (GIS) analysts, program coordinator, and administrative assistant. Four of these positions are new WCS investments to the program this year, indicating increased WCS commitment to the development and use of landscape tools for

site-based conservation. These new positions also indicate a shift in responsibilities, increasing our ability to extend the tools we are developing to a larger array of conservationists.

Activity 4.1 Provide technical assistance to site-based conservation

Members of the NY Coordination Unit will provide technical input to field site operations detailed in the previous sections of this report, some of which will involve trips to sites. (as cited)

Results/Outputs:
Focused and timely technical assistance and collaboration provided to field sites based on needs, leading to conservation landscape strategies, target monitoring of effectiveness, and processes in place to increase participation of stakeholders.

Activity 4.2 Design, implementation, and testing of decision support tools

Activity 4.2.1 Living Landscapes Program technical manuals
The Living Landscapes Program will continue to produce brief how-to guides, called Technical Manuals, after field testing and fine-tuning the methods at several WCS field sites. In FY06, we will finalize and disseminate three technical manuals that are currently in review: Building Monitoring Frameworks from Conceptual Models; Conducting Household Surveys; and Building Biological and Human Landscapes. We will also produce a technical manual on selecting landscape species. The manuals are designed to provide clear and practical instructions to field practitioners on implementing a number of conservation tools. The manuals will also be translated into Spanish and French, and disseminated to WCS projects, partners (government, NGO and local), and other conservation colleagues.

Activity 4.2.2 Landscape Species Approach progress

4.2.2.1 Building Conservation Landscapes
In May 2005, at the LLP Annual meeting, 7 landscapes presented their preliminary conservation landscapes (i.e., maps of conservation priorities) and methods for making them, including how they incorporated biological and threat information. We concluded that while Biological and Threats Landscapes were vital information for choosing priority areas, how these 2 pieces of information should be weighted against one another (e.g., protect high value, low threat habitat first or high value, high threat) is still unclear, and may differ depending on the conservation context. Additional information may be necessary to make practical decisions on where conservation activities should take place, such as cost of conservation activities, urgency of the threats, probability of success, history of the project, and opportunities.

Over the first half of 2006, LLP staff in New York will continue to refine methods for building conservation landscapes, based on what we learned at the annual meeting. By January 2006, we will have drafted a Technical Manual on building conservation landscapes that describes the various types of spatial information that could be used in prioritizing areas, and suggests options for incorporating this information into a final map of priorities (e.g., simple rules, use of decision support software such as Marxan). By the end of FY 2006, we will have distributed this draft manual, asked 3-4 sites (Guatemala, Adirondacks, Madidi, and Glover's Reef) to use the manual and make new or refined conservation landscapes, and finalize the technical manual based on the experiences of these sites.

4.2.2.2 Review of the Landscape Species Approach
Review of the Landscape Species Approach (LSA) will continue during this fiscal year. An assessment of the use of LSA tools - amount of time spent on landscape species selection, level of participation in doing threats assessment, etc – will help us draw some principles to be able to advise others on the utility of the approach, its individual steps, and the conditions under which it may or may not provide advantages to conservation. LLP

intends to use the findings of the review to better adapt our program and LSA tools for the practice of site-based planning and implementation.

4.2.3 Develop monitoring frameworks at sites
Over the past couple of years, all of the demonstration sites have developed and fine-tuned their conceptual models that can now be used to design their monitoring frameworks. We will work closely with these sites as they develop and refine their monitoring frameworks and monitoring plans during the next year, ensuring that sites go beyond concepts - into the practice of project monitoring.

4.2.4. Develop rules of thumb for intervention planning
A number of project staff have highlighted the need for intervention planning and prioritization tools - How to turn research into conservation action; How to build confidence in choice of intervention activity and place; How to take advantage of windows of opportunities, etc. During the last LLP annual meeting, the participants decided that the most useful guidance in determining priorities among interventions would be in the form of rules of thumb, and a small group began to outline some ideas that the CU will expand and make available to staff for review during the next few months.

Results/Outputs:
Technical manuals designed, tested in the field, and distributed in hard copy as well as on CDs and on-line for wider distribution. Monitoring frameworks developed for each site. A 'rules of thumb' document for intervention identification and prioritization and made available to field staff. Guidelines for effective use of LSA tools written up and made available to other site-based conservation practitioners.

Activity 4.3 Catalyze cross-site and cross-organizational learning, and communication

Activity 4.3.1 CMP: leadership, design, writing and audits
CU staff will continue to play a leadership role in the identification, design and implementation of Conservation Measures Partnership activities. We will work closely with Foundations of Success to begin population of causal chains and best-practice indicators in the Strategic Indicator Selection System (StratIS), and will work with all CMP members to identify best-practice tools to use as models for development of eAdaptive-Management modules. Lastly, we will continue to provide technical input into specifying measurable Global Indicators of Biodiversity status.

4.3.2 Local engagement in conservation survey
We will organize and host a 5-day writers retreat for several senior WCS field staff. The retreat is designed to capture their experience integrating local people into the successful practice of landscape scale conservation. This retreat follows-up a more wildly distributed questionnaire that was used to frame the theoretical and practical issues associated with effectively integrating local people into the practice of conservation. The report generated during the writers retreat will be published as a WCS International Program Working Paper and will be made available as a PDF on our website and as a hard-copy document.

4.3.3 Preliminary assessment of the human welfare impacts of establishing national parks
With funding provided by the John D. and Catherine T. MacArthur Foundation and the National Science Foundation, LLP staff in collaboration with the WCS Gabon program, the Gabon National Parks Authority and Boston College conducted a baseline household welfare survey of 1,000 households with traditional claims to natural resources within 4 national parks in Gabon, and an additional 1,000 control households living outside the influence of the parks. This survey is the first of three surveys planned over the next 5 years to assess the income, health, consumption, natural resource use, and family function impacts of establishing protected areas on local families. Results of the baseline survey will be analyzed during FY06 and will allow us to assess the role that wild resources and market access play in the welfare status of families proximal to and distant from the parks.

Results/Outputs:
Synthesis of results of local engagement in conservation surveys compiled and made available for use. Results of the baseline study will be published in a peer review journal

Activity 4.4 Application of Living Landscapes Program tools beyond core sites

4.4.1 Training workshops in the use of LLP tools
A number of workshops to train field practitioners in the use of conservation tools will be organized and implemented throughout the year. Among others, the socio-economic monitoring specialist and the program director will hold a training workshop for conservation projects as part of the WCS Marine Regional Program Meeting. We have been asked by Dr. Glyn Davies, the Director of Conservation Programs at the Zoological Society of London to run a workshop to train his global staff on the use of LLP conservation planning tools. The 2-3 day training workshop will occur in London in November, 2005. In January of 2006 we will help local and international partners in the Samburu-Laikipia Landscape in north-central Kenya to use LLP conservation planning tools to come to a common vision for wildlife conservation in this complex dry savanna landscape. We also expect to conduct a training of national park management staff in Madagascar in partnership with the WCS Madagascar program, and Conservation International. This training will focus on the use of conceptual models as a basis for strategic site conservation planning. Lastly, we will continue to support adoption of conceptual models and monitoring frameworks by landscape scale projects in: Brazil – Mamiraua, and Piagacu Purus; Peru - Yavari Mari; Venezuela – Caura River; Ecuador – Yasuni, and Bolivia – Gran Chaco. These projects are supported by funds from The Gordon and Betty Moore Foundation.

4.4.2. Technical Manuals
We will continue to make our series of technical manuals available to conservation practitioners and decision makers on our website, as hard-copy booklets and on CD. Manuals are available in English, French and Spanish.

Results/Outputs:
Training workshops and symposium planned and held to make available the principles distilled from implementation of the USAID/EGAT funded sites over the past six years to other site-based conservation projects around the world.

Activity 4.5 Ensure coordination and communication services for the program
The program director and program coordinator will meet with staff from the core sites and other WCS large-scale conservation sites to discuss the development of the program, on-the-ground implementation of the Landscape Species Approach, and further development of tools relevant to the approach. Program staff will also meet with collaborators, NGOs, governmental officers, and representatives of other stakeholder groups to promote use of the strategies and tools, to assess their utility, and to determine whether additional tools would be of use.

Throughout the year, the Coordination Unit will assist field staff in completing annual Implementation Plans, reporting on Performance Monitoring forms, and submitting Annual Reports. The program coordinator and other members (as necessary) will attend quarterly USAID/EGAT meetings in Washington DC and will ensure regular reporting and updates to USAID.

Results/Outputs:
The Coordination Unit will serve as a hub for communication regarding the Program among WCS field staff, core sites, current and potential conservation partners and interested members of the general public. Timely preparation and submission of USAID reports.