

Development and Implementation of the Management Plan for the St. Thomas East End Reserves, St. Thomas, U.S. Virgin Islands

Plan de Desarrollo e Implementación de la Gestión de las Reservas de Este Santo Tomas, Santo Tomas, E.E.U.U. Islas Vírgenes

Plan de Développement et la Mise en Œuvre de la Gestion dans les Réserves de l'East End de St. Thomas, USA Îles Vierges

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ABSTRACT

The St. Thomas East End Reserves (STEER) encompasses 9.6 km² of significant coastal, marine and fisheries resources, including mangrove forests, seagrass beds, coral reef communities, offshore cays, and a salt pond. In recognition of the importance of these natural and cultural resources as well as the imminent threats to them, a collaborative planning process between the STEER community, the Virgin Islands Department of Planning and Natural Resources, University of the Virgin Islands, and The Nature Conservancy was initiated in May 2008 to develop the STEER Management Plan to provide the long-term vision for the area and guide near-term (3-5 years) objectives and activities. The Management Plan was developed using The Nature Conservancy's Conservation Action Planning methodologies, based on the principles of adaptive management. Implementation of the management, research, policy, enforcement and outreach strategies recommended in the Management Plan have begun. There have been challenges and success in filling research gaps, keeping partners coordinated and the community involved as well as establishing the mechanisms for sustainable funding, support, and governance.

KEY WORDS: Marine protected area, US Virgin Islands, Caribbean

INTRODUCTION

Marine and coastal natural resources provide valuable ecosystem services such as shoreline protection from erosion and storm damage; habitat and food for juvenile and adult species; and nutrient cycling and water purification (McLeod et al. 2005). These, among other, ecosystem services have high cumulative economic value. For example, in 2000 over half of the population of the United States lived along the coast, and more than \$200 billion in economic activity was associated with the ocean (U.S. Commission on Ocean Policy 2004). Therefore threats to these ecosystem services have large economic as well as ecological consequences. Land and marine-based sources of pollution, eutrophication, shoreline development, detrimental fishing, and climate change impacts threaten coastal resources globally (Short et al. 2006). Economically and ecologically significant tropical marine ecosystems, including mangroves, seagrass beds and coral reef communities, also face similar threats. In the U.S. Virgin Islands, a combination of natural and human disturbances have degraded the mangroves, seagrass beds, fisheries, and coral reef communities (Rogers and Beets 2001). In the St. Thomas East End Reserves, the study site, threats include land-based and marine-based sources of pollution, habitat loss, climate change, unsustainable or illegal fish harvest, invasive predators of sea and shore birds, incompatible use issues, trash and debris, and physical damage from boats (STEER 2011).

Marine protected areas (MPA) are created, in part, to protect, conserve, and manage natural resources and abate threats. The process of working through Conservation Action Planning (CAP) for a protected area results in a comprehensive management plan based on a solid foundation focused on specific and attainable strategies for biodiversity conservation and threat abatement. Ultimately, the CAP process results in the identification of threats to natural resources and capacity issues, development of strategies to abate threats and address capacity issues, scheduling and financing planned for monitoring and management effectiveness measures and creation of an overall work plan for the local management authority for translation into yearly work plans (TNC 2007).

The CAP methodology has been utilized and tested by The Nature Conservancy and its partners for over fifteen years and has resulted in effective management plans for hundreds of protected areas around the world. CAP is based on the principles of adaptive management and is designed to facilitate and utilize input from stakeholders. The CAP process guides project teams to identify effective conservation strategies. It provides an objective, consistent and transparent accounting of conservation actions and the intended and actual outcomes of conservation projects. It enables project staff to responsibly adapt their actions to improve strategy effectiveness and achieve greater conservation impact (TNC 2007).

Implemented through a series of planning meetings with the Core Planning Team and Stakeholder Advisory Group, CAP was used as a mechanism to develop a strategic vision, identify threats, recommend management activities and establish monitoring for the St. Thomas East End Reserves (STEER). The STEER Core Planning Team and STEER Stakeholders have used the strategies and schedule recommended in the Management Plan to initiate effective MPA management efforts.

METHODS

Study Site

The St. Thomas East End Reserves (STEER or Reserves) is the most recent addition to the USVI system of marine protected areas (MPAs). STEER combines three areas, covering a total of 9.6 km², that were designated in 1994 as Marine Reserve and Wildlife Sanctuaries (MRWS): Cas Cay / Mangrove Lagoon, St. James, and Compass Point Salt Pond. A portion of STEER was declared an Area of Particular Concern (APC) in 1979, specifically the Mangrove Lagoon/Benner Bay APC. STEER has been established by the USVI government to protect coastal and marine resources including mangrove forests, seagrass beds, coral reef communities, fisheries, and a salt pond. The Reserves contain several off-shore cays and the largest remaining mangrove forest in the USVI.

In the coastal zone surrounding STEER there are various residential neighborhoods, hotels and condominiums, boatyards, a horse racetrack and large municipal dump. The largest watershed on St. Thomas, Jersey Bay, flows into the Reserves through Turpentine Run Gut. There are many stakeholders that live adjacent to or on their live-aboard boats in STEER; conduct boat, snorkel, dive and kayak trips in STEER; and recreate at popular beaches and anchorages. Fishing is prohibited with the exception of hand line and bait fishing with a permit. Any take of lobster, conch, or whelk is prohibited. However, the Reserves lack a dedicated USVI regulatory management body or manager. Instead, the STEER Core Team, comprised of representatives from the STEER community, USVI Department of Planning and Natural Resources (DPNR), University of the Virgin Islands, Friends of Christmas Cove, and The Nature Conservancy (TNC), have established the STEER Management Plan and acted as an informal co-management steering group.

Management Plan

The CAP methodology employed to develop the management plan for STEER centered around significant input from two groups: the STEER Core Planning Team and the STEER stakeholders/community. Meetings were held on a regular basis over two years to work through the following 11 steps of the CAP process:

- i) Identify site, management context;
- ii) Determine stakeholders, experts, core drafting team;
- iii) Define scope, vision, set conservation targets;
- iv) Assess viability of targets;
- v) Identify critical threats to those targets;
- vi) Conduct situation analysis;
- vii) Strategies - include Objectives, Strategic Actions;
- viii) Establish measures: management effectiveness, threat abatement, resource protection;
- ix) Develop work plans: monitoring, funding, staffing, training, yearly activities;

- x) Implement the management plan, and
- xi) Analyze, learn, adapt, and share.

The final two steps are being conducted now: Implement and Analyze, learn, adapt, and share. At each stage of the CAP process, meetings were conducted to examine critical questions (Table 1).

RESULTS

Conservation Action Planning (CAP) was implemented between 2008 to 2011 through a series of 50 planning meetings and workshops with the Core Planning Team and the Stakeholder Advisory Group. Facilitated discussions resulted in the development of goals, identification of priority conservation resources and their condition, understanding of human and natural activities impacting the resources, and selection of objectives and strategies for improving or maintaining the resources within STEER. The resulting Management Plan is based on a solid ecological foundation focused on specific and attainable strategies for biodiversity conservation and threat abatement.

Components of the Management Plan include an activity plan, an effectiveness monitoring plan, a financial business plan, and a zone and mooring plan. The Plan is part of an adaptive and iterative management process, ultimately leading to the sustainable use of the coastal and marine resources in STEER. It is designed to provide guidance in the near-term, but is also open to modifications based on periodic evaluation of management activities and results.

The Activity Plan centers around the identification of Targeted Resources, Threats to those Targeted Resources and Strategies to abate the Threats. Targeted Resources identified include mangroves, seagrass beds, sea and shore birds, coral reef communities, nursery and fisheries resources, compatible and sustainable use and enjoyment, and the Compass Point Salt Pond.

Threats to Targeted Resources include land-based and marine-based sources of pollution, habitat loss, climate change, unsustainable or illegal fish harvest, invasive predators of sea and shore birds, incompatible use issues, trash and debris, and physical damage from boats.

Strategies to abate these Threats include improved watershed and stormwater management; increased coordination of permitting, regulation and enforcement of non-point and point source pollution and coastal development to prevent further habitat loss and sedimentation; improving enforcement of existing coastal rules and regulations; community outreach; developing a climate change adaptation plan; creation of a moorings program within STEER; developing a zone and mooring plan for recreational and commercial activities; improve bird nesting success and survival rates by reducing predation by introduced species and entanglement by discarded monofilament; and restoration activities (Table 2).

Table 1. Stages in the Conservation Action Planning Process and their Objectives

Stage in the CAP Process	Objective and Critical Questions
Identify site and management context	This stage identifies the protected area and the management context. Critical Questions: What is the need for the plan? Is the site already protected? What are the circumstances surrounding the need for a management plan?
Determine stakeholders, experts, core drafting team	This stage asks you to identify your most valuable resource – the people who will be involved in designing and implementing your project. Critical Questions: Who will design our project? Who will be responsible for ensuring the plan goes forward? Who can give us advice? and Who will help us through this process?
Define scope, vision and set conservation targets	In this stage you define the extent of your project and select the specific species and natural systems that your project will focus on as being representative of the overall biodiversity of the project area. This step helps your project team come to consensus on the overall goal and scale of the project and your ultimate measures of success. Critical questions: Where is our project? “What are we trying to conserve or restore?”
Assess viability of targets	This stage asks you to look at each of your focal targets carefully to determine how to measure its “health” over time and then to identify how the target is doing today and what a “healthy state” might look like. This stage is the key to knowing which of your targets are most in need of immediate attention, and for measuring success over time. Critical questions: How do we define ‘health’ (viability) for each of our targets? What is the current status of each of our targets? What is our desired status for each of our targets?
Identify critical threats to those targets	This stage identifies the various factors that immediately affect your project’s focal targets and then ranks them so that you can concentrate your conservation actions where they are most needed. Critical questions: What threats are affecting our targets?? affecting our targets? and manage natural resources and abate the threats s the following targeted resources, threats a Which threats are more of a problem?
Conduct situation analysis	This stage describes the current understanding of the project situation, both the biological issues and the human context in which the project occurs. This step is not meant to be an unbounded analysis, but instead probes more deeply into the conditions surrounding the critical threats and degraded targets to bring explicit attention/consideration to causal factors, key actors, and opportunities for successful action. Critical questions: What factors positively & negatively affect our targets? Who are the key stakeholders linked to each of these factors?
Develop strategies, objectives and strategic actions	This step specifically and measurably describes what success looks like and develops practical and strategic actions partners will undertake to achieve it. In particular, it is important to identify the actions that will enable you to get the most impact for the resources you have. Critical questions: What do we need to accomplish? What is the most effective way to achieve these results?
Establish measures for management effectiveness, threat abatement and resource protection	This step determines how to measure results. This step is needed to help the team see whether the strategies are working as planned and thus whether adjustments will be needed. It is also needed to keep an eye on those targets and threats that you are not acting on at the moment, but may need to consider in the future. Critical questions: What do we need to measure to see if we are making progress towards our objectives and whether our actions are making a difference? Are there other targets or threats that we need to pay attention to?
Develop work plans for monitoring, funding, staffing, training and yearly activities	This step asks you to take your strategic actions and measures and develop specific plans for doing this work as your project goes forward. Addresses questions like: What do we specifically need to do? Who will be responsible for each task? What resources do we need?
Implement the management plan	During this stage, the action and monitoring plans are implemented.
Analyze, learn, adapt and share	This stage systematically evaluates the actions that have been implemented, updates and refines knowledge of the targets, and reviews the results available from the monitoring data. This reflection provides insight on how the actions are working, what may need to change, and what to emphasize next. This step then requires documentation of lessons learned and sharing it so that others can benefit from successes and failures. Critical questions: What are our monitoring data telling us about our project? What should we be doing differently? How will we capture what we have learned? How can we make sure other people benefit from what we have learned?

Table 2. Summary of Strategies for STEER ranked by priority, impact and feasibility. Strategies are identified as high, medium and low priority.

HIGH PRIORITY	
Threat	Strategy
Impaired watershed	Strategy 1.1.A: Redesign a comprehensive USVI non-point source (NP) and point-source (PS) pollution permitting, regulatory and enforcement program Strategy 1.1.B: Watershed and Stormwater Management: Partner with public and private sector to reduce NP
Coastal habitat loss	Strategy 3.1.B: Develop more stringent regulations for shoreline and insular development
Illegal harvest- fish	Strategy 3.1.A: Regulate development in STEER and nearby habitats
Lack of public access	Strategy 4.1.A: Enforce existing regulations in STEER waters Strategy 6.1.B: Zone Use Plan: Recreational and Commercial
Monofilament-bird	Strategy 7.1.C: Establish bird entanglement response network Strategy 7.1.B: Community outreach
Anchor Damage	Strategy 8.1.A: Create buoy mooring system in popular boating areas containing coral and seagrass habitat within STEER
Accidental groundings	Devise groundings team network for rapid response
MEDIUM PRIORITY	
Threat	Strategy
Impaired watershed	Strategy 1.2.B: Improve water circulation/flow within Inner Mangrove Lagoon
Coastal habitat loss	Strategy 1.2.A: Determine the contaminants in the lagoon Strategy 3.1.C: Research priority: collect baseline data: coral coverage, seagrass, mangroves, shoreline habitat
Predation on Birds	Strategy 3.1.D: Reduce habitat loss on Great St. James due to development Strategy 5.1.A: Develop shoreline predator trapping program
Monofilament-bird	Strategy 7.1.A: Reduce monofilament
Accidental groundings	Remove grounded boats (See 7.3: Removal of Derelict Vessels)
Vessel Sewage	Strategy 8.2.A: Groundings prevention, rapid response and removal Strategy 9.1.A: Establish/ Advocate on-board treatment and/or Pump-Out Program for STEER
LOW PRIORITY	
Threat	Strategy
Impaired watershed	Strategy 1.3.A: Restoration of Compass Point Salt Pond
Coastal habitat loss	Strategy 3.1.E: Reduce loss of mangroves due to coastal development within or adjacent to STEER
Lack of public access	Strategy 6.1.A: Public Access Program to improve existing public access points and identify new access points
Derelict vessels	Strategy 7.3.A: Develop a derelict vessel reporting and removal system
Solid waste- Compass Pt. Salt Pond	Strategy 7.2.A: Develop trash prevention program
Vessel Sewage	Strategy 9.2.A: Promote Blue Flag Program (Clean Marina Program)
Hydrocarbons- passing vessels	Strategy 9.3.A: Re-route ferry boats, barges through Great/Little St. James

The Monitoring Plan was developed to assess the status of the resources STEER aims to protect and to evaluate the effectiveness of some of the strategies proposed in this Management Plan. The Monitoring Plan enables managers to evaluate whether a strategy is working as planned and thus whether adjustments are needed. It also helps keep an eye on those targets or threats that are not acted on at the moment, but may need to be considered in the future.

The STEER Sustainable Finance Plan was developed using World Wildlife Foundation's financial modeling template and TNC's methods of Integrated Strategic and Financial Planning following Conservation Finance Alliance methods and the Convention of Biological Diversity Programme of Work on Protected Areas. Development of the STEER Sustainable Finance Plan included a finance gap assessment, which aided in the development of a realistic work plan, with associated costs. The resulting financial model provides comprehensive, long-term estimates of costs of each program, as well as potential sources of revenue. The total costs, revenue estimates, and gap analyses derived from the model provide the components for developing sustainable funding vehicles and fundraising proposals.

The Zone and A Proposed Zoning and Mooring Plan was compiled from an inventory of the natural resources within STEER as well as with stakeholder input. Channels are marked for boating traffic to assist with minimizing wake; however additional signage and moorings will be added to assist users with locations designated for certain types of permitted activities within STEER. The Zones include:

- i) General Use Zone: area where surface waters are kept clear for recreational and transit uses. Anchoring and extraction of resources are prohibited;
- ii) Low-Impact Use Zone: area where anchoring is allowed with a permit for a maximum of seven (7) days. Extraction of resources is prohibited as is tying to mangroves;
- iii) Preservation Zone: area designated for ecological sensitivity compatible with non-motorized craft and passive recreational activities where motorized watercraft, extraction of any resource, and anchoring is prohibited, and
- iv) Emergency Anchor / Hurricane Mooring Zone: area where hurricane moorings are located and temporary anchorages are allowed only during major storm events as this zone is kept in Preservation otherwise.

DISCUSSION

Development of the Management Plan over three years encouraged participation and investment by numerous citizens in the community and partners on the Core Planning Team, including various Divisions of DPNR, faculty and staff at UVI, a citizen group called the Friends of Christmas Cove and The Nature Conservancy. The STEER Community and Core Planning Team continue to implement strategies in the Management Plan and have developed into an informal co-management advisory body for STEER. The STEER Implementation Specialist, a position recommended in the Management Plan and filled by The Nature Conservancy through a grant from NOAA's Coral Reef Conservation Program, coordinates implementation of the Management Plan, meetings with partners and encourages additional research and projects in STEER.

The STEER Core Planning Team and Stakeholders meet monthly and communicate agendas, notes and announcements through a STEER Google Group, an online consortium of approximately 100 members to date. Other effective forms of communication are newspaper articles, press releases, radio show discussions and flyers posted at local establishments. These forms of communication have resulted in an informed public, awareness of STEER activities at the DPNR Commissioner level and coordination between DPNR Divisions responsible for conducting regulatory, enforcement and research in STEER. There has also been a modest increase of reporting of illegal activity and subsequent enforcement action.

Information gaps identified in the STEER Management Plan center around the status of the Targeted Natural Resources and the magnitude of threats that impact them. NOAA researchers and UVI faculty and staff of the Masters of Marine and Environmental Science program have become active in the area, conducting various research projects to assess these gaps.

Challenges to Management Plan implementation include funding shortages that limit STEER management activities and staffing. Staffing, capacity and funding shortages at DPNR limit regulatory and enforcement activity in STEER. Finally stakeholder fatigue with the slow process of turning a paper park into an actively managed MPA in the Caribbean is an issue. Despite these challenges, development and implementation of the Management Plan, to date, have raised the visibility of STEER, initiated management of natural resources, encouraged research in the area and actively coordinated the STEER community and partners.

LITERATURE CITED

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