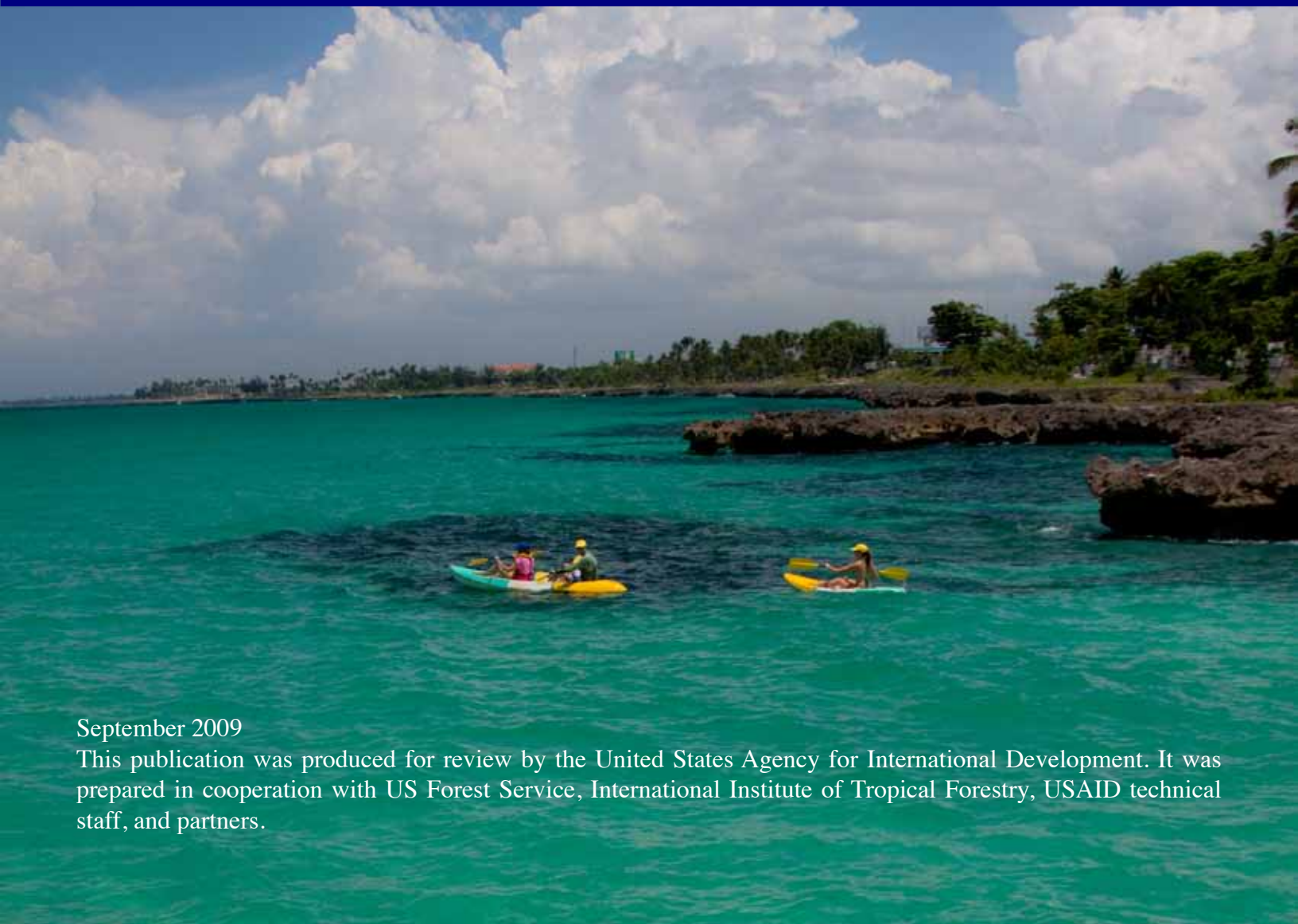




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INTEGRATING CONSERVATION AND SUSTAINABLE TOURISM IN THE DOMINICAN REPUBLIC: RAPID ASSESSMENT OF BIODIVERSITY THREATS AND A CONSERVATION STRATEGY FOR THE PARQUE NACIONAL SUBMARINO LA CALETA



September 2009

This publication was produced for review by the United States Agency for International Development. It was prepared in cooperation with US Forest Service, International Institute of Tropical Forestry, USAID technical staff, and partners.

Bibliographic Citation

Wylie, Jerry and Jerry Bauer, 2009. Integrating Conservation and Sustainable Tourism In The Dominican Republic: Rapid Assessment of Biodiversity Threats and a Conservation Strategy For the Parque Nacional Submarino La Caleta. Report prepared by the USFS International Institute of Tropical Forestry for the US Agency for International Development, in support of the Dominican Sustainable Tourism Alliance.

Credits

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TECHNICAL REPORT

INTEGRATING CONSERVATION AND SUSTAINABLE TOURISM IN THE DOMINICAN REPUBLIC: RAPID ASSESSMENT OF BIODIVERSITY THREATS AND A CONSERVATION STRATEGY FOR THE PARQUE NACIONAL SUBMARINO LA CALETA

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Solimar International

Reef Check

Submitted to:

USAID/Dominican Republic

September 2009



This work was completed with support from the people of the United States through USAID/Dominican Republic by the USDA Forest Service International Institute of Tropical Forestry under PAPA No. AEG-T-00-07-00003-00, TASK #7 (Sustainable Tourism Support) with assistance from local and international partners and collaborators.

DISCLAIMER

The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.



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I.0 INTRODUCTION

This assessment was conducted as part of the USAID funded activities of the Dominican Sustainable Tourism Alliance (DSTA). The DSTA has selected the community of La Caleta and the Parque Nacional Submarino La Caleta (La Caleta Marine National Park) to receive technical support for the development of a community-based ecotourism enterprise using the park as the attraction and setting for a variety of nature and culture-based tourism programs.

The Nature Conservancy's Conservation Action Plan (CAP) process is the selected planning system for DSTA activities. This rapid assessment follows the 10-step CAP process as outlined in the Conservation by Design Gateway (TNC, 2009).



2.0 PROJECT DESCRIPTION AND ENVIRONMENTAL SETTING

Site Description and Location

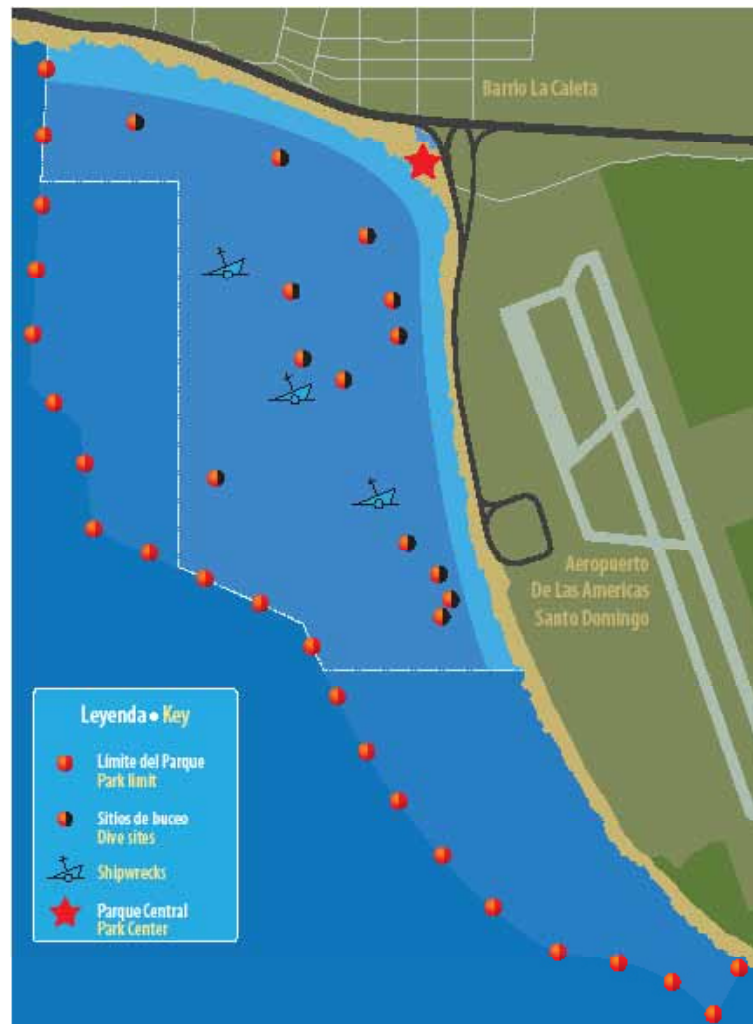
The Parque Nacional Submarino La Caleta was established in 1986 to protect the coral reef and prehistoric Taino archeological remains. As the first marine park in the Dominican Republic, it is situated 20 km east of the capitol city of Santo Domingo, population about 2 million, and immediately adjacent to the International Airport of the Americas and the town of La Caleta, with 60,000 residents. The park includes more than 5 km of rocky coastline with generally calm and clear tropical waters that attract SCUBA divers from the city as well as local bathers. It is physically separated from the town by a busy four-lane highway (Map 1).

This site is situated within an urban setting classified as “Urbano” in the ROVAP system.

Urban environments are typically dominated by a mix of residential, commercial, industrial, and tourism infrastructure (hotels and convention centers), together with transportation and services associated with urban environments such as electricity, potable water, sewer systems, and traffic control. Within these environments there are green spaces, small gardens, parks, museums, etc. and a variety of opportunities for cultural and tourism activities. There will also be constant contact with people in these environments (Wallace, et al., 2009).

Most of the park’s 10 square kilometers are underwater and include coral reefs, areas covered with sponges and seaweeds, and sandy flats. Four sunken modern ships provide artificial reef habitat and serve as attractions for divers. The park’s waters include 60 species of coral, 36 species of sponges, and 89 species of fish (Reef Check, personal communication).

Map 1. Parque Nacional Submarino La Caleta.



The terrestrial portion of the park is highly modified and has very little natural vegetation or biodiversity. It is comprised of scattered trees, grassy areas, a rugged shoreline of uplifted coral limestone that is highly eroded and extensive paved trails, roadways, and infrastructure in various levels of disrepair. Before they were seriously damaged by storms, other improvements included a large concrete pond, a small café, an archeological museum, and a ticket booth. There is also an active cemetery dating back to the 1880s.

Mission Statement and Business Description

The park offers a range of potential activities for Santo Dominicans, business travelers, and international visitors. A “Beach Club” managed by the community could provide natural, cultural, and culinary products to these target segments while supporting job creation, community development, and biodiversity conservation.

While final products are still being defined through market demand surveys and investment requirements, the following options are being considered:

- Museum/visitor center with gift shop and public restrooms
- Café/gift shop
- Dive shop
- Underwater interpretive trails for divers and snorkelers
- Aquatic center with boat and kayak rentals
- Walking/biking trails
- Guided tours
- Beach rental equipment

Project Partners

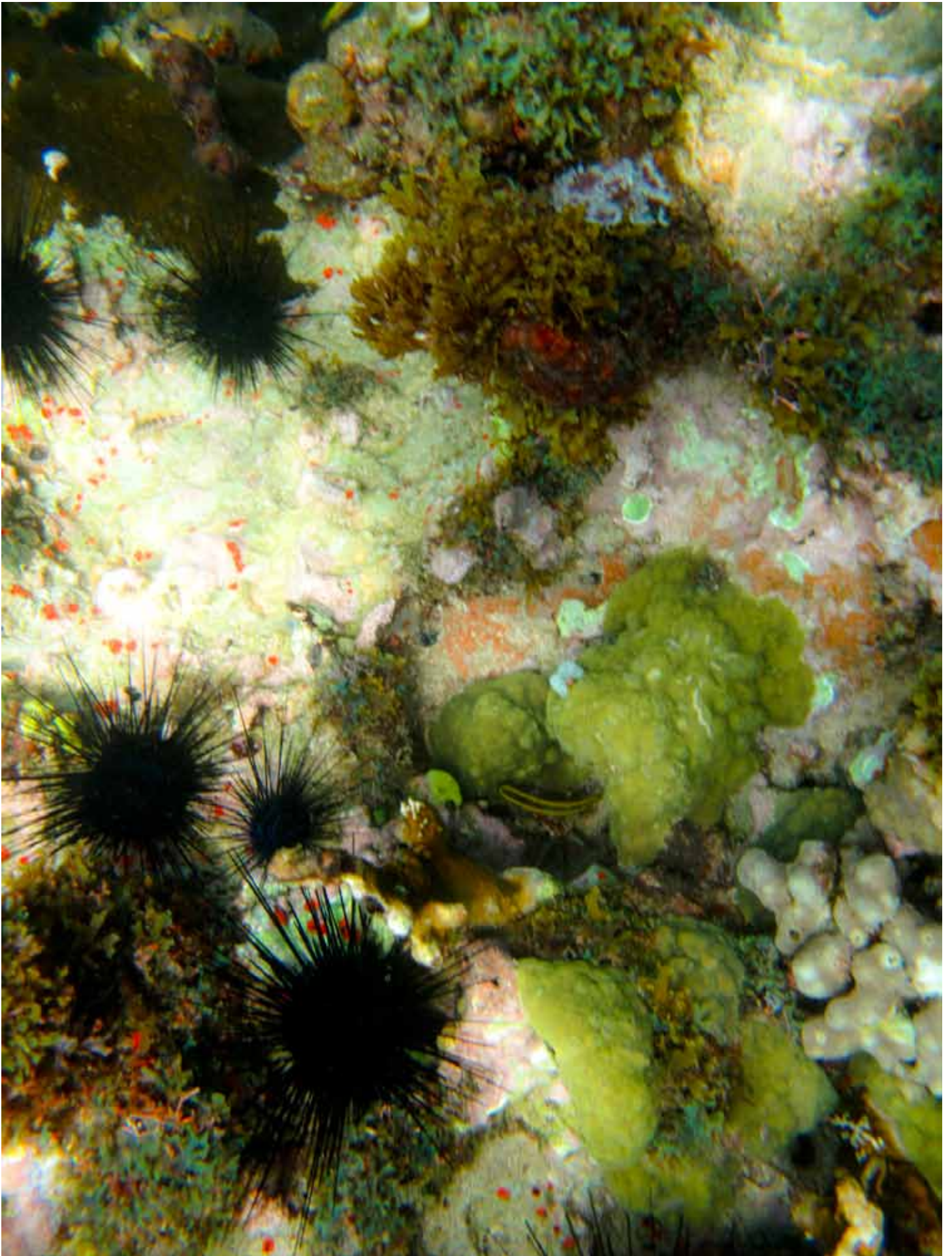
This community-based enterprise is currently being supported by USAID/DSTA through the active participation of SEMARENA, the U.S. Peace Corps, Reef Check, US Forest Service, the British Embassy, and the American Chamber of Commerce. Future projects involving Taino and underwater archeology will require the active participation of Indiana University and the Museo de Hombre Dominicano (Museum of the Dominican Man) and Oficina Nacional de Patrimonio Cultural Subacuático (National Office for Underwater Cultural Patrimony).

Recent and Ongoing Activities

The park has seen many recent improvements. For example, the old café has been cleaned out and its tattered thatched roof removed; restoration and expansion of the ruined Taino museum was started in late 2009 (although it has been halted recently; and new trees have been planted).

Solimar International, as part of the DSTA project, has undertaken extensive business planning and capacity building with the community, including training in tourism operations, guiding, food services, sales/marketing, and the development of a business plan (Silver, 2009).

A grant from the Inter-American Foundation (IAF) was awarded to Reef Check to continue their program of reef monitoring, installation of buoys, and community workshops. In addition, two ceramic sculptures based on Taino designs were recently installed on the reef to attract divers. Reef Check also received a grant from the Programa de Pequeños Subsidios to reestablish lobster populations using artificial habitat and an education campaign for fishermen.



3.0 FIELDWORK

Our first visit to the park took place on October 16, 2008 with the purpose of assessing the area's potential for kayak tourism (Wylie and Bauer 2008a). The second visit was carried out on June 3, 2009 during which time the team conducted a photographic survey of terrestrial and aquatic tourism opportunities and began collecting data to assess biodiversity threats and opportunities for sustainable tourism. The third visit on September 1, 2009 focused on identifying the immediate needs for signage and visitor information. The current report is based on these visits as well as a review of existing reports and discussions with key individuals.

4.0 GOALS

The general goals of sustainable tourism are to maximize the positive benefits that tourism can have on biodiversity, ecosystems, and economic and social development, while minimizing negative social and environmental impacts from tourism (TNC 2009 ; Secretariat of the Convention on Biological Biodiversity, 2004). In addition, an important goal is to maintain a high level of biodiversity as an attraction for tourism.

In addition, the agreement between USAID/DR and USDA Forest Service to assist the DSTA lists these specific goals:

- Promote sustainable tourism, with an emphasis on biodiversity conservation.
- Identify biodiversity threats and determine activities that would minimize them.
- Support economic development of local communities in conjunction with the regional tourism clusters.
- Integrate tourism, interpretation, and public education and conservation.
- Strengthen the Dominican Republic Protected Area Management System.
- Develop partnerships in the community.
- Strengthen the relationship of the clusters to other tourism activities in the region.
- Increase financial sustainability of regional clusters through income generation and promotion of an enabling operating environment.



Figure 1. Taino sculptures installed to test the potential for an underwater art gallery.

5.0 A BENEFITS-BASED APPROACH

It is clear that conservation must be integrated into development activities. However, the ultimate goal of integrating sustainable tourism and biodiversity conservation is not only to reduce threats or avoid impacts, it is the creation of sustainable benefits for the environment and the local community (Global Sustainable Tourism Criteria, 2009 ; USAID/ARD 2005a:28) and visitors, who are often overlooked.

To achieve this integration and meet the project objectives listed previously requires a benefits-based model of sustainability that provides linkages and synergies between all three elements. Since they are directly linked, actions in one element affect the other two (Figure 2). Details of this model are presented in Annex A (Wylie and Bauer, 2008b).

This model is not only a theoretical concept; it is a practical “compass” for providing direction at each stage of project planning, implementation, and monitoring. For example, it can help:

- Define and expand the project’s vision and goals
- Focus the threats and opportunity assessments
- Develop integrated conservation/tourism targets
- Analyze positive “value-chain” linkages affecting tourism opportunities
- Create a conceptual model describing linkages among causal factors
- Develop specific actions with monitoring measures
- Select and prioritize activities with synergistic linkages

Looking Beyond Threats to Biodiversity

Threats-based analysis is a proactive approach and is not limited to environmental impacts. It should consider past influences while anticipating and planning for future threats and opportunities (USAID/ARD, 2005a). Also, considering only quantitative biological information is insufficient; we must recognize the human dimension of ecosystem management by using social sciences to monitor social, economic, political, and cultural threats and opportunities where feasible and useful (Stem et. al 2005).

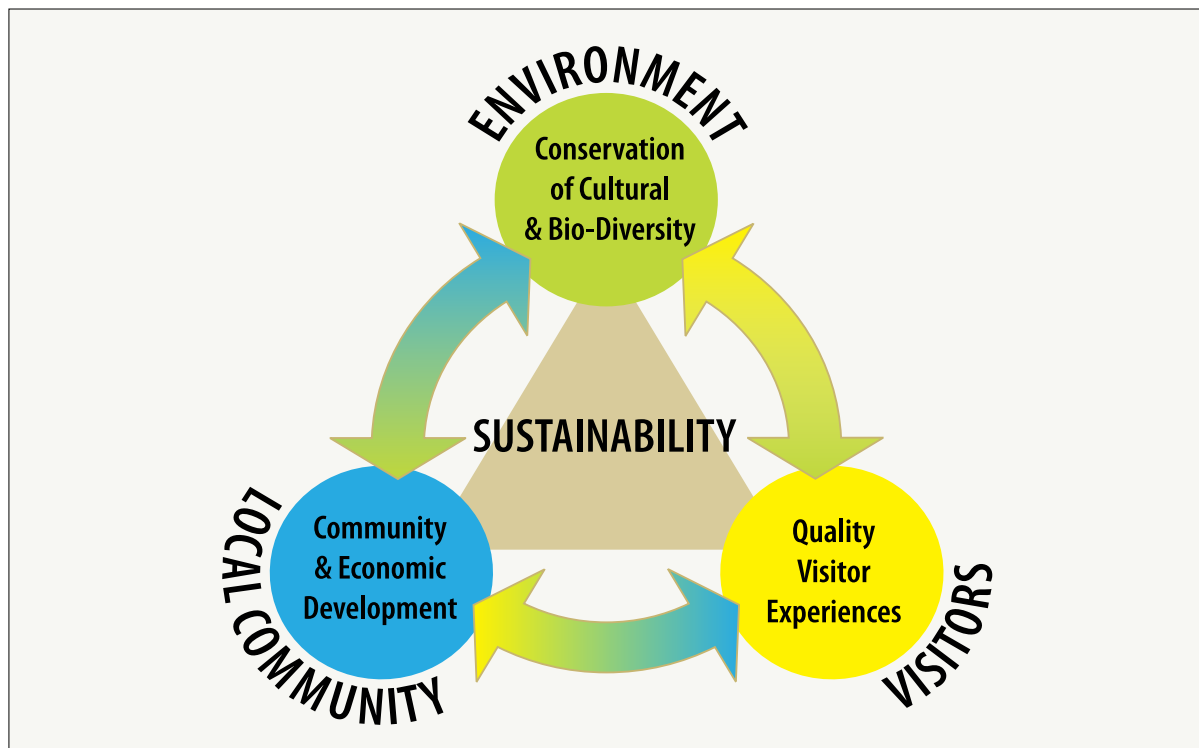


Figure 2 – Sustainable Tourism Model.

6.0 RAPID ASSESSMENT OF THE PARQUE NACIONAL SUBMARINO LA CALETA

A rapid assessment of park conditions was conducted and is summarized in Table I. These include positive and negative conditions for the environment, the community, and the visitors. This quick assessment used to define priorities can be updated by a more detailed assessment depending on the results of initial monitoring.

Direct and Indirect Threats

Clearly, the most serious potential threats to the park are the loss of reef habitat and associated species as a result of natural and human impacts. This would not only reduce its ecological value, but also its value as a tourism attraction.

The direct threats to the biodiversity in the Parque Nacional Submarino La Caleta are destruction of reef habitat and loss of marine species. However, to fully understand these threats, the “causal chain” of root causes (indirect threats) must be understood. “Often, the most effective—and sometimes the only—way to reduce a direct threat to biodiversity is to carry out actions that address its root causes” (USAID/ARD 2005a:27 ; USAID/ARD 2005b:29). These contributing factors may be economic, political, institutional, social, or cultural. Indirect threats in the project area include damage to the reef due to careless anchoring of boats, illegal fishing, and unregulated SCUBA diving. These threats are considered in the Conservation Action Plan (CAP) by addressing the underlying socio-economic factors listed in Figure 3.

Other threats that could affect tourism and visitor satisfaction include vandalism of land-based facilities, crowding, over development or overuse causing environmental damage, conflicting recreational uses, and public safety concerns with possible criminal activities. Potential (albeit unlikely) threats to the community are restrictions on public access and loss of local control.

Current Weaknesses

The biggest current environmental weakness is the loss of fish populations due to overfishing and a lack of management, planning, law enforcement, and environmental awareness (some of which have recently begun to be corrected). In addition, the exposed Taino burials within the old museum are extremely deteriorated and vandalized.

From a visitor’s perspective, the greatest weakness is a lack of well-maintained public facilities, trained guides, and environmental interpretation, as well as reduced fish populations which limit the opportunity to view fish. Trash also detracts from the visitor experience, as does the small beach size and crowding on busy days.

The community’s commercial opportunities are limited by a lack of advertising, signage, and trained guides, as well as the poor quality of the fishery. However, there are encouraging signs of a possible recovery in fish stocks due to new educational and management programs.

Current Strengths

The primary strength of the park as a tourist attraction is its designation as a national park, its proximity to the city, and the presence of a reef and small beach. This has made it a popular destination for bathers and SCUBA divers.

There is also a strong connection between the community and the park supported by the fishermen/guide cooperative (COOPRESCA), the environmental NGO Reef Check, and a U.S. Peace Corps Volunteer.

Future Opportunities

There are numerous opportunities for creating benefits for the environment, the community, and visitors, some of which have already begun to be implemented.

One of the most important opportunities is environmental interpretation used to educate local residents and visitors about threats to biodiversity and which serves as a starting point for conservation actions for the park. Interpretation of natural and cultural heritage can be delivered through displays in the Visitor Center, signage, and by trained interpretive guides.

Recreational opportunities can be expanded through the creation of a Museum/Visitor Center, new interpretive trails on land and underwater, and development of a program that provides kayak instruction, rentals, and guided tours.

The lifestyle and culture of the Taino, who greeted Columbus on this very shore, could also be shared with the visiting public in an outdoor setting. Possibilities include a restored Taino hut, “living history” activities involving traditional artifacts and domestic activities, and interpretation of how native plants were utilized.

The historically documented 1725 wreck of the Spanish ship La Begonia on the La Caleta’s beach offers unique and exciting opportunities for archeologists, local residents and park visitors. Archeological excavations could be a big attraction and the resulting artifacts and information could be presented in the museum and on interpretive panels along the shore. In addition, replicas of select artifacts could be displayed in an underwater “museum” for snorkelers.

Underwater art can also be used to promote dive tourism and environmental stewardship. Individual pieces or collections of art in underwater “galleries” have been successfully used to increase visitation to dive sites in the Caribbean and worldwide (Appendix D). Photographs or smaller versions of underwater art can be created by local artists and sold as souvenirs. Installation celebrations also generate publicity and attract large crowds.

The community will directly benefit from increased visitation and improved tourism programs through tourism-related jobs, sales of souvenirs, and tips, as well as access to improved public facilities. In the future, local fishermen will also benefit from an improved fishery as fishing stocks recover from overfishing and lobster “houses” are built.

Figure 3. Direct and indirect threats and contributing factors.

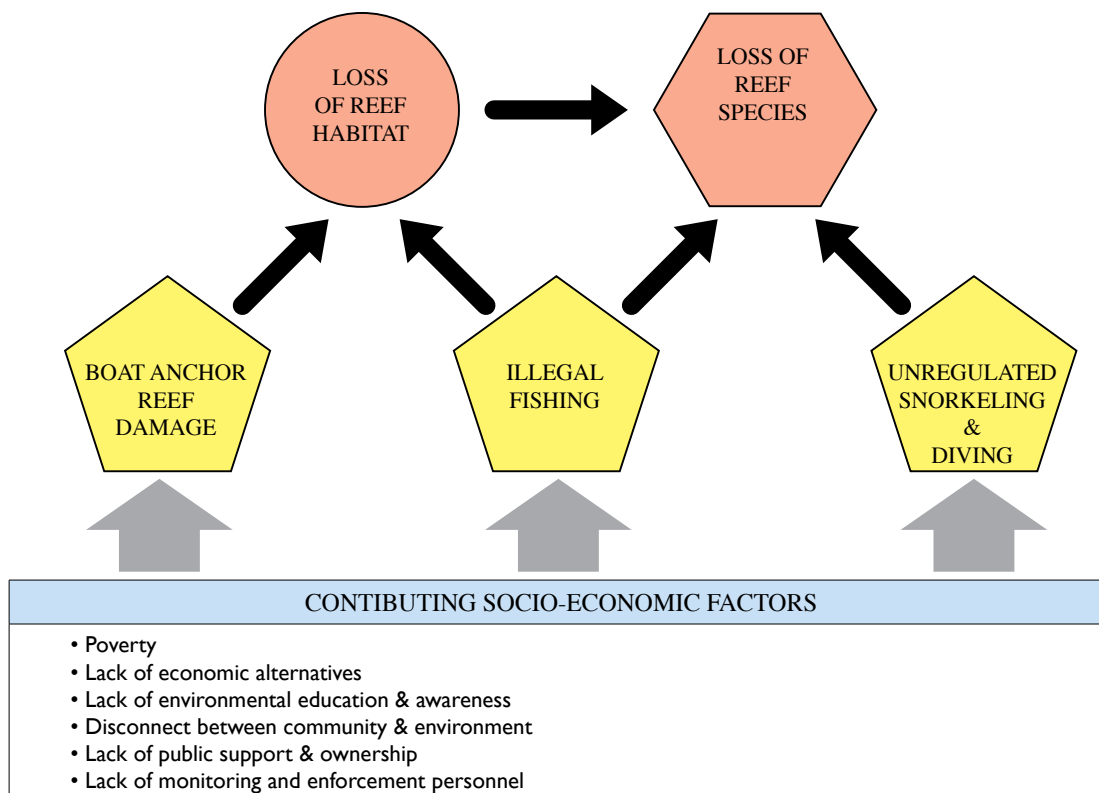


Table I. Rapid Assessment Summary For The Parque Nacional Submarino La Caleta

	ENVIRONMENT	THE COMMUNITY	VISITOR EXPERIENCE
THREATS	<ul style="list-style-type: none"> Loss of marine species Pollution and trash Vandalism Storm damage to reef Diver/snorkeler damage Anchor damage to reef Over development Over use 	<ul style="list-style-type: none"> Loss of public access Loss of community control 	<ul style="list-style-type: none"> Crime Crowding Conflicting uses and activities Degraded reef
WEAKNESSES	<ul style="list-style-type: none"> Low fish populations No management plan Limited law enforcement Poor infrastructure condition Lack of planning Poor condition of exposed <ul style="list-style-type: none"> Taino burials Small beach 	<ul style="list-style-type: none"> Lack of public awareness Uneconomic fishery Separated by highway No advertising No trained guides 	<ul style="list-style-type: none"> No interpretation Limited signage Limited services Trash on land & water Lack of visitor awareness Few aquatic species to see Limited water access Small beach Crowding at beach
OPPORTUNITIES	<ul style="list-style-type: none"> Enhanced management Enhanced protection of biological & cultural resources Conservation fund Restored fisheries Restored native vegetation 	<ul style="list-style-type: none"> Good business location Jobs and employment Improved facilities Co-management of park Job training Art-related programs Souvenir sales Sustained fishery in fishing zone 	<ul style="list-style-type: none"> Enhanced experiences Interpretation of nature & culture Underwater trail Underwater sculpture More fish to see Fitness trail Kayak classes, rentals & tours Observe archeological excavations Taino living history hut and activities Ethno-botanical garden Underwater museum replica of shipwreck
STRENGTHS	<ul style="list-style-type: none"> National Park status Location and access Natural and artificial reefs Sandy beach (very rare) Attractive trees & reef Taino archeology Spanish shipwreck "La Begonia" Considerable infrastructure Base-line reef monitoring 	<ul style="list-style-type: none"> Proximity to park Fishermen & guide cooperative Peace Corps Volunteer Reef Check NGO Popular local recreation 	<ul style="list-style-type: none"> Water access Parking Swimming and SCUBA Proposed logo

7.0 BIODIVERSITY CONSERVATION STRATEGIES AND ACTIONS

The objective in integrating biodiversity conservation and sustainable tourism is to provide a set of actions that addresses the major threats and opportunities identified previously. These actions are designed to produce benefits for the environment and the local community and to meet the needs of visitors.

Actions currently underway include extensive training and development of a business plan for the community. These are based on five conservation strategies developed by Solimar International (2009). They include:

1. Development of a conservation fund to support local projects
2. Income diversification through jobs based on resource conservation
3. Trained guides providing monitoring and enforcement for the park
4. Constituency-building through enterprises directly linked to conservation
5. Co-management of the park

Recommended actions for biodiversity conservation and sustainable tourism are summarized in Table 2 and are described in detail in Appendix A. Because they emphasize visitor experiences enhanced through information and environmental interpretation, they provide an additional approach that complements and supports the previous five strategies:

6. Environmental awareness and stewardship through interpretation of cultural and natural resources and biodiversity conservation

These new activities are based on the sustainable tourism model described above and follow the steps in the Visitor Experience Model (VEM) summarized in Appendix C. The VEM classifies the travel experience into different phases, each with its own key questions for visitors, objectives for managers, and suggests ways to achieve these objectives.

Although these actions are primarily focused on connecting and communicating with visitors, they will also benefit the community and the park. As an example, Figure 4 illustrates how advertising and environmental interpretation can promote community and economic development and biodiversity conservation. Promotional materials will increase the number of visitors, which in turn will provide more income and profits for community members, funds for community projects, and improvements in infrastructure to benefit both visitors and residents.

When visitors arrive at the park, interpretive signs and tours provided by trained guides will significantly enhance the quality of the visitor experience, leading to positive word-of-mouth advertising, as well as an increase in public awareness of critical threats to the park. This, in turn, will lead to public support for the park and environmental protection in general and will provide opportunities for visitors to donate to the community conservation fund. Interpretive signs and guided tours will also manage visitor activities within the park, thus minimizing damage to both terrestrial and marine resources.

Figure 4. Summary of benefits resulting from promotional materials and interpretative programs.

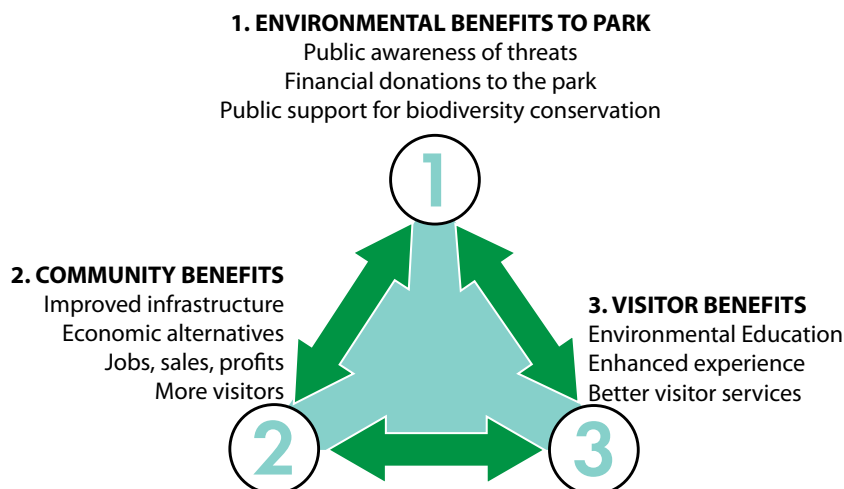


Table 2. Summary of action items to promote biodiversity conservation and sustainable tourism.

Action Item	Phase*
Prepare management plan for the park	I
Continue monitoring of marine biodiversity	I
Sign planning for the park	I
Photography	I
Design initial signs, banners, maps & brochures	I
Build storage facility for kayak equipment	II
Install initial signs and banners	II
Build storage facility for kayak equipment	II
Purchase kayaks and equipment	II
Initial training of kayak guides	II
Update published guide books	II
Develop souvenirs	II
Donation box and visitor comment book	II
Design webpage for La Caleta	II
Reconstruct Café and Gift Shop	II
Reconstruct Museum/Visitor Center	I & II
Install signs and interpretive materials	II & III
Restore or construct other visitor facilities	II & III
Advanced training & certification of kayak guides	II & III
Plan and design underwater trail	II & III
Plan and design underwater sculpture	II & III
Gather monitoring information	II & III
Design final interpretive displays for Museum/Visitor Center	III
Evaluate monitoring data and make adjustments as needed	III
Survey and excavation of Spanish shipwreck "Begonia"	III
Create underwater museum replica of shipwreck artifacts	III
Design final interpretive displays for Museum/Visitor Center	III

*Phase I – 1 to 6 months, Phase II – 6 to 12 months, Phase III – 1 to 3 years

8.0 RECREATION AND INTERPRETIVE PLANNING

Key Issues

Planning for recreational use and environmental interpretation at the park first requires answering the following questions:

1. What is the overall mission and vision of the park and its management goals for dive tourism, environmental education, and conservation?
2. Who are the audiences? SCUBA divers, snorkelers, school groups, local residents, Santo Domingo recreationists, or cruise tourists?
3. What is the primary interpretive message that will serve as the central organizing concept? What are the supporting sub-messages and the local story?
4. What are the mechanical, financial, and legal constraints?
5. What are the potential threats and opportunities for biodiversity conservation and sustainable tourism?

Goals

Potential planning goals for the park suggested by the Recreational Opportunity Spectrum (ROS) methodology include:

- Provide high-quality recreation settings and opportunities for both land and water recreational use.
- A range of satisfying experiences for the visitor, including recreational, educational, aesthetic, and adventure.
- Natural and cultural resources are protected.

The development of successful underwater visitor programs at the park can be guided by two premises: 1) visitor experiences can be enhanced or hampered by how we manage settings, and 2) maintaining diversity of opportunities provides visitors with important choices. Both of these depend on maintaining biodiversity and cultural resources (i.e. the coral reef and Taino archeology), which are the main attractions of the park.

In other words, some visitors may prefer a highly-developed (man-made) setting with large numbers of people, while others come to experience nature in a natural setting with small groups of people. Therefore, we should consider a range of settings and associated activities with underwater trails and sculptures at the “developed” end of the scale and maintain or create views with high scenic value.

For suggestions on planning and managing underwater trails and underwater art, see Appendix D.

9.0 MONITORING AND EVALUATION

Although there are no standardized USAID indicators for monitoring threats to biodiversity, recommended criteria for developing such indicators suggest that they should be “useful, measurable, attributable, realistic, timely, reliable, and direct” (USAID/ARD 2005b:40). Based on these criteria, the following socio-economic indicators are proposed to measure the success of the community’s tourism program and to serve as indirect indicators for mitigation of conservation threats. They are easy to collect and closely linked to biodiversity conservation, community and economic development, and quality visitor experiences.

Biodiversity Conservation Indicators

- Money collected for the community conservation fund
- Less illegal fishing (qualitative)
- Number of community volunteers for conservation projects
- Number of conservation projects completed
- Less vandalism (qualitative)
- Less damage to the coral reef and land vegetation
- More trees and native vegetation

Community and Economic Development Indicators

- Money collected from park entrance fees
- Money donated by visitors
- Money generated from souvenirs
- Number of people with new tourism jobs
- New or improved infrastructure in the park for locals and visitors
- Number of new members of COOPRESCA
- Profits by COOPRESCA
- Number of trained guides

Visitor Demand and Satisfaction Indicators

- Number of total customers
- Number of website hits
- Number of visitor complaints
- Number of visitor compliments
- Tips to guides (qualitative)
- Positive reviews on Trip Advisor and similar social networking websites

Data for each of these indicators should be gathered by the community and used to measure how goals are being met and to help refine conservation activities.

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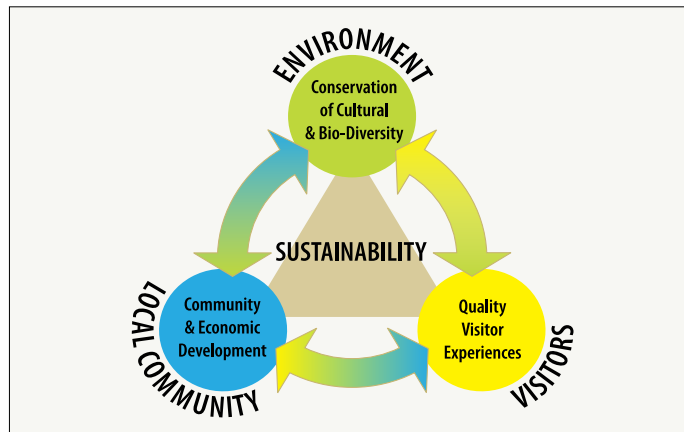
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APPENDIX A. Sustainable Tourism and Biodiversity Conservation Model

This is a model of sustainable tourism development that provides linkages and synergies between visitors, communities, and the environment so that benefits in one area create benefits in the other two.



Conservation relates to the overall health of the environment, as measured by biodiversity and preservation of historic sites. It also ensures high-quality settings for residents and visitors and the product base for tour providers. Indicators include:

- Acres/hectares protected or restored
- Historic and cultural sites protected or restored
- Scenic vistas enhanced
- Number and types of species observed
- Reduction of depreciative behavior (litter, looting, wildfires, graffiti, etc.)
- Political support for conservation agencies and programs
- Hours and money donated
- Entrance fees collected

Community and Economic Development enhances the quality of life for residents and creates business opportunities. Successful tourism businesses and communities provide infrastructure and services, financial and volunteer support for conservation projects, and political support for conservation projects and agencies. Benefits include increases in:

- Numbers of jobs related to conservation
- Economic diversification and percent of jobs conservation-related
- Income
- Profits
- Taxes
- Infrastructure for local residents and visitors

Quality Visitor Experiences are the foundation for successful tourism. They depend upon properly managed, resources settings and attractions (including scenery), professional tourism services and infrastructure, and adequate visitor information and interpretation. Without a quality visitor experience there will be no sustainable tourism and no public or financial support for parks and conservation. Potential benefits include:

- Increased customer satisfaction and loyalty
- Longer stays and willingness to pay
- Repeat visits
- Word-of-mouth advertising
- Positive psychological, social, and physiological changes for the individual
- Education and appreciation
- Changes in visitor attitudes and behavior

APPENDIX B. Conservation Strategy & Action Items Based on The Visitor Experience Model (VEM)

Decision-making and Pre-trip Preparation Phase

This is the initial point of contact, which is done at home before departing. The objective is to help prospective clients make the decision to visit and create proper expectations. This is done by introducing and “selling” the attraction, providing realistic information about what activities and services are available, and generally making a positive connection between the client and the site.

Recommended actions include:

- Logo - Use a standard logo or icon in all graphic designs that gives the site a unique and attractive marketing identity.
- Printed advertising - Design a small rack card to advertise the park at hotels and other businesses in Santo Domingo.
- Guidebooks – Update existing descriptions of the park in published guidebooks.
- Internet advertising - Upload a selection of high-quality photographs to suitable internet photo sharing websites such as Google’s “Panoramio.”
- Webpage – Develop a website to promote the park.

Travel Phase

This phase covers travel from Santo Domingo, and it should provide whatever information and reassurance is necessary to help the traveler find the site. The guidebooks and rack card from Phase I will be helpful here. In addition, we recommend:

- A highway approach sign one kilometer from the park.
- Banners along the highway with the park logo.
- A highway entrance sign.

Entrance Phase

This phase should welcome the visitor, provide basic orientation, explain what there is to do and see, and convey a positive sense of place. To do this, we recommend:

- Welcome sign – Paint a welcome sign on the two existing cement signs in the parking lots at all three entrances to the park.
- Visitor information kiosks - Install two small visitor kiosks with a park map and information: one north of the museum for visitors arriving from the café or from the northwest and the other southeast of the museum for visitors arriving from the existing central or southern parking lots.

Connections and Interpretation Phase

This is when visitors experience what the site has to offer and receive interpretive information provided by signs or tour guides. The interpretive objective is to help visitors understand and appreciate the role of the park in protecting the marine environment, the critical threats, and how this community-based sustainable tourism program is working to provide benefits to the environment, the community, and the visitors. Recommended actions include:

- Interpretive planning – Develop a central message and supporting sub-themes that address the critical threats of loss of reef habitat and overfishing for use in the rebuilt museum.
- Museum/Visitor Center – Restoration and redesign of the old Taino Museum is currently underway. In the interim, utilize the café and gift shop as a temporary interpretive location.

- Interpretive signs – Design interpretive panels explaining the critical threats to the park and the important role of the community in co-management. These can be located in the new Museum/Visitor Center. Initial signage will be designed to meet immediate short-term needs for information and interpretation. As permanent infrastructure is completed, final signs and displays will be developed.
- Interpretive presentation – Develop an interpretive presentation to be delivered by tour guides.
- Interpretive trails – Plan and design new trails for interpreting natural and cultural resources on land and underwater. These can be either guided or self-guided trails.
- Maps – Design a new and updated visitor map of the park.
- Kayaking – Implement the recommendations of the 2008 kayaking assessment to develop a high-quality program for kayak instruction, rentals, and tours.
- Underwater art – Consider using underwater sculptures for promoting dive tourism and environmental stewardship.
- Photography – Train guides so that they can take photographs of tourists with the visitors’ own cameras.
- Taino living history – Consider constructing a replica of a traditional Taino hut and providing hands-on outdoor activities involving Taino artifacts and crafts, as well as interpretation of how native plants were utilized.
- First Aid – Develop an emergency plan and purchase a first aid kit for dealing with minor cuts and scrapes.

Exit and Commitment Phases

This is where visitors have completed their visit and are leaving the site. Important objectives include saying “Thank You” and providing ways for them to contribute financially to the community’s tourism program by purchasing souvenirs and making additional donations. Recommendations for this phase include:

- “Gracias” sign – Install a sign thanking visitors for coming and contributing to the community conservation fund.
- Souvenirs – Develop appropriate souvenirs for sale, such as post cards or handcrafts with images of the park and Taino sculptures. If this includes the name and/or logo of the site, these materials would also serve as advertising.
- Donations – Prepare a box for additional donations to the village conservation fund. Include a description of specific projects this money will be funding.

APPENDIX C. Visitor Experience Model (VEM)

Interpretive planning provides the entire “experience package” to answer key questions and influence visitor behavior at each travel phase and produce desired results (benefits).

Key Visitor Questions	Management Objectives	How Achieved/Measured
DECISION & PRE-TRIP PREPARATION PHASE		
Why visit? What experiences are possible? Cost in time/money? What is proper behavior? Is it safe/healthy?	Create proper expectations Introduce the central theme Get commitment Sell the primary attraction Connect with the visitor	Brochures Word - of - mouth Advertising Travel guidebooks Image/logos
TRAVEL PHASE		
How do I get there? Am I on right track? How long? Am I safe?	Reassure the visitor Sell secondary attractions Enjoy the journey See new things	Travel guidebooks Hotel fliers Maps & signage Guides
ENTRY PHASE		
Is this the right place? Where to park? Where is the bathroom? What is there to see and do? Hours/prices/regulations?	Welcome the visitor Handle basic human needs Transition from travel Reinforce the central theme Convey a sense of place	Signage Hosts Orientation Positive visual cues Local architecture
CONNECTIONS PHASE		
What is this place? What is the story? What am I looking at? Why is this important? Why is this relevant to me?	Exposure to theme/sub themes Participation in programs Have a variety of experiences Visitor connects to place	Interpretive programs Activities Exhibits Engage all 5 senses
EXIT PHASE		
What did I experience/learn? Is it over? What does it mean? What can I take back?	Decompress the traveler Digest messages Consider deeper meanings Thank the visitor for coming	Gift shop/souvenirs Donation box Visitor comment book “Thanks...Come Again!”
COMMITMENT (RESULTS) PHASE		
How do I respond? How do I feel? What do I do now?	Provoke a response Achieve desired benefits Transform the visitor Change attitudes/behavior	Profits & Donations Referrals & repeat visits Thank-you letters Changed attitudes/behavior Public support for your program

APPENDIX D. Underwater Trails and Sculpture

Advice for designing and managing underwater trails from James Cook University in Australia (CRC 2009):

- Research shows that damage by snorkelers to branching corals is 8 times greater along trails and 13 times more around interpretive signs compared to adjacent areas.
- Design trails to avoid concentrating people at fixed points, thus causing damage.
- On the Great Barrier Reef Marine Park, rest stations using poles and floating inner tubes are installed.
- If underwater signs are used, they should be placed in areas of sparse coral cover or on sandy bottoms.
- Underwater signs are often difficult to read and need regular cleaning of algae.
- Small underwater trail markers with hand holds can be used to help snorkelers pause to observe marine life.
- Numbered trail markers used with portable waterproof information sheets explaining each point may be a better means of providing information.
- Trails should be sited away from waves and strong currents for safety.
- Trails should be located in water sufficiently deep to avoid fin damage (2.2 meters) but shallow enough to provide good viewing.
- Minimize impacts through proper site selection, temporary closures or rotations, limiting visitors, or creating more trails.

A suggested code of practice for underwater trail use provides this advice for SCUBA divers (IUCN, et al. 2009):

- Secure all trailing SCUBA equipment.
- Make a buoyancy check at the beginning of the dive.
- Discourage the use of gloves to deter divers from touching coral.
- Carry out practice activities, such as snorkeling for beginners, away from live coral.
- Novices should always be supervised by someone experienced.
- Provide good briefings before visitors enter the water.
- Inform visitors about restrictions on collecting.

Using Reef Balls for Underwater Interpretive Trails (Harris and Woodring, 2001)

“For reef protection as well as eco-tourism, artificial reef units used as underwater snorkel trail markers can safely guide snorkelers and divers around shallow natural reefs, providing information and education on the reefs and their inhabitants, while also providing marine habitat themselves.”

Projects in the Turks and Caicos Islands involve trails designed to lead snorkelers along a path “safe” for both people and the reef. Trail markers include educational information on reef ecology and reef etiquette. The base of the trail markers are medium-size concrete Reef Ball units with interpretive tiles. The funds and labor to construct the reef were donated by volunteers assisted by the Reef Ball Coalition. Two-week programs taught students the fundamentals of marine ecology and involved construction and deployment of the artificial reefs.

Their report also describes a breakwater project involving 450 Reef Balls at the Gran Dominicus Resort on the DR in 1998 for shoreline stabilization.

Examples of Underwater Interpretive Trails

1. Trunk Bay Trail, Virgin Islands National Park. First trail in the Caribbean. Average depth 13 feet.
2. Dry Tortugas National Park, Florida. Waterproof map and fish ID guide.
3. Condado Lagoon, Puerto Rico. Three trails with “Taino” style cement modules.
4. Bai de la Palud, Port Cros Island National Park France with 4,500 visitors annually.
5. Smith Reef, Turks and Caicos. Snorkel trail. Ceramic tiles attached to concrete Reef Balls interpret reef life.

Art Promoting Dive Tourism and Environmental Stewardship

Jason de Caires Taylor’s collection in Moilinere Bay, Grenada, the world’s first underwater art gallery, is probably the best model for La Caleta. It contains 65 pieces covering an area of 800 square meters at a depth of 2 to 25 meters. Installation began in 2006, replacing earlier pieces destroyed by a storm.

Other examples include:

- “Christ of the Deep”, Key Largo state park, Florida, 1965. 25 feet deep. Duplicate of an earlier underwater statue in Europe.
- Simon Morris’ “Guardian of the Reef” sculpture slated to be installed at various locations worldwide in partnership with the Reef Ball Foundation.
- Mermaid at Sunset House, Grand Cayman. Installed in 2000 with a major event involving 1,000 spectators.

Factors to Consider with Underwater Art (from an interview with Taylor)

- Any underwater gallery creates a whole new perspective on the world.
- Magnification is increased by 25%.
- Filtered light from above is constantly changing.
- Colors are absorbed and reflected differently depending on depth.
- Objects can be viewed from all angles, thus increasing the dramatic effect.
- Turbidity acts as a filter.
- The ocean setting is imbued with mystery.
- The viewer is immediately committed and involved and becomes part of the work.
- The exhibit is ever-changing as nature colonizes the surface and the sea shapes the texture.

- Art can create a diversion from other areas of the coral reef that are endangered by overuse.
- Destruction and evolution are parts of the artistic process and a natural part of the reef ecosystem. (Taylor encourages the development of marine life on his pieces and is exploring the use of transplanted corals to create the shape of future sculptures.)
- Placing pieces deeper for protection from storms puts limits on lighting and public access.

Other Activities Associated with Underwater Art

1. Involving local art students in workshops. Taylor made casts of workshop student’s faces and added them to his Grenada underwater gallery.
2. High-quality photographs of underwater art can be sold as souvenirs.
3. Smaller versions of underwater art created by local artists can be sold as souvenirs and jewelry.
4. Key pieces of art can be used as design elements in park facilities and print materials

APPENDIX E. Summary of Recommended Signs for The Parque Nacional Submarino La Caleta, Phase I

Highway Signs (metal)

- A. Approach (“PARQUE NACIONAL SUBMARINO LA CALETA I Km”
- B. Café (“NAME” of café when determined)
- C. Entrance (“PARQUE NACIONAL SUBMARINO LA CALETA”)

Directional Signs (painted wood)

- D. Bathrooms & Office (“BANOS & OFICINA” and arrow)
- E. Women’s bathroom door (“MUJERES”)
- F. Men’s bathroom door (“HOMBRES”)
- G. Office (“OFICINA”)
- H. Museum (“MUSEO”) ...or wait for Phase II?
- I. Ticket Booth (“BOLETERIA”)

Welcome and Entrance/Exit Signs

- J. Café (“NAME” of café when determined) artistic wooden sign
- K. North Park entrance (“PARQUE NACIONAL SUBMARINO LA CALETA”) painted concrete
- L. South Park entrance (“PARQUE NACIONAL SUBMARINO LA CALETA”) painted concrete
- M. Central Park entrance (“PARQUE NACIONAL SUBMARINO LA CALETA”) painted on concrete map

Orientation Kiosks

Two or three panels showing the park map, fees, hours, and rules in Spanish and English

- N. SE of Museum for visitors arriving from the southern parking lot
- O. NW of Museum for visitors arriving from the café or the north parking lot

Interpretive Kiosk/Panels (vinyl or durable plastic)

- P. Marine orientation: marine boundaries, buoys, wrecks, trails, sculpture and photos
- Q. Cemetery

Vinyl Banners (6’ x 8’ displayed at Café)

- R. Fish
- S. Coral Reef
- T. Taino Culture History
- U. Taino Art
- V. Park Attractions
- W. Sea Kayaking
- X. SCUBA Diving
- Y. Community Partners
- Z. Museum under construction (install outside museum)

Highway Flags

- AA. Vinyl logo banners on 7 light posts along the highway

Figure 5. Draft of Phase I signs for the Parque Nacional Submarino La Caleta, developed in cooperation with Reef Check and Solimar International.

