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RAPID ASSESSMENT FOR ECOTOURISM DEVELOPMENT AT LAGUNA LIMÓN, LOS GUINEOS, DOMINICAN REPUBLIC



March 2012

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TECHNICAL REPORT

RAPID ASSESSMENT FOR ECOTOURISM DEVELOPMENT AT LAGUNA LIMÓN, LOS GUINEOS, DOMINICAN REPUBLIC

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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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1.0 INTRODUCTION

1.1 Background

Laguna Limón is located on the north east coast of the Dominican Republic in the province of El Seibo, 28 km from the town of Miches at coordinates 18°55'N 68°50'W. It is part of a system of lagoons located on the coastal plain between the Cordillera Oriental and the Atlantic Ocean. It has a maximum depth of 2 m and receives waters from several streams such as Caño El Negro and Río Las Lisas, and is connected to the ocean by a short channel. The vegetation in the area is dominated by cattail (*Typha domingensis*) and the legumes of the genus *Machaerium* (Map 1).

Laguna Limón was declared a scientific natural reserve and an Important Bird Area in 1983, a natural reserve in 1995, and as a wildlife refuge in 2004. The surrounding lands are mostly privately owned. Activities around and within the lagoon include fishing, aquaculture, cattle grazing, and farming, as well as coconut and rice cultivation.

Three small communities, El Cedro, Los Guineos and Las Lisas, are located nearby the lagoon, although the Los Guineos community is mostly identified with the lagoon (Map 2). The lagoon was stocked with a non-native fish, Tilapia, which is being fished commercially by local community members from Los Guineos. This is the major economic generator for this community.

Two small hotels are located near the lagoon, Hotel Harley's Heaven and Hotel Rancho La Cueva. Most tourists to the lagoon are connected to these hotels, either by staying a night or two or through a pre-arranged tour given by the hotel operators that form part of a local tourism company.

The roads leading to the lagoon are in very poor condition and a 4x4 vehicle is needed to access the site during the rainy season.

A US Peace Corps Volunteer has been working with the Los Guineos community for the past two years to assist them in diversifying their economic base by developing ecotourism. A local community tourism committee has been established to offer small-scale kayak tourism in the lagoon.

In addition, The Center for Environment, Economy, and Society at Columbia University has been managing an environmental project in the area for the past few years, with support from USAID.

1.2 Existing conditions at Laguna Limón

The Ministry of Environment and Natural Resources manages the Laguna Limón, which is part of the "Lagunas Limón y Redonda Wildlife Refuge". A small guard station is located along the south side of the lagoon near the village of Los Guineos. A few signs and a latrine are located at this location. Other than this, there are no trails or visitor facilities at the lagoon except for a boardwalk constructed by a local hotel owner to take visitors from the beach to the lagoon. This is poorly constructed, not maintained and in a very unsafe condition.

1.3 Fieldwork

The team surveyed the entire shoreline by powerboat the morning of January 28, stopping to hike the boardwalk to the beach and examine the visitor facilities along the beach from the boardwalk to the canal. A strong wind came up that afternoon and we conducted an introductory class for three kayak guides at the refuge office.

The next day we met with community members in the morning and then transported three kayaks across the lake in a powerboat, where we paddled through the canal to the beach and attempted to locate the old canal that is blocked by thick mangroves. We also used the kayaks to explore the tall mangroves along the lake shore near the canal and conducted a short rescue class for the three original guides plus two others. Afterwards, three guides and Evan Poirson, the Peace Corps Volunteer, paddled back across the lake to refuge office.

2.0 DESCRIPTION OF THE LAGUNA LIMÓN WILDLIFE REFUGE

2.1. Flora

Among the most noticeable vegetation of the lagoon are the floating aquatic plants *Pistia stratiotes*, *Lemna* sp. and the mosquito fern (*Azolla caroliniana*). Among the submerged plants that are rooted in the bottom of Laguna Limón and grow until reaching superficial predominance dominates the species *Elodea*, *Ceratophyllum* sp. and the *Najas marina*. The predominate plants on the water banks are the reeds of the gender *Typha* and the lilacs *Eichornia crassipes*. Inland from the reeds are mangroves on the north side and rice fields and pastures to the south. Associated with the mangroves on the northern shore is an area dominated by the hibiscus (*Hibiscus tiliaceus*).

The mangrove fern (*Acrostichum danaeifolium*) dominates the vegetation of the marshes and swamps of superficial waters, covering an area larger than the mangroves. In a characteristic zone between the north and east side of the lagoon of, mangroves dominate almost completely the marshes and swamps where fresh and salt-water mix. The red mangrove (*Rhizophora mangle*) is dominating. You can also find the other three species that are known in the country, including button mangrove (*Conocarpus erectus*), white mangroves (*Laguncularia racemosa*), and the black mangrove (*Avicennia germinans*). The beach vegetation has been almost entirely replaced by coconut trees. The presence of a vine with fragrant flowers (*Darlingia berterii*) is somewhat common.

2.2. Birds

A total of 63 species of birds have been reported for the Laguna Limón and its surroundings from various studies. Five of these species are endemic to the Hispaniola: Palmchat (*Dulus dominicus*), Black-crowned Palm-tanager (*Phaenicophilus palmarum*), Hispaniolan Woodpecker (*Melanerpes striatus*), Broad-billed Tody (*Todus subulatus*) and Hispaniolan Lizard-Cuckoo (*Coccyzus longirostris*). The avifauna is represented principally by Caribbean Coot (*Fulica caribaea*), West Indian Whistling Duck (*Dendrocygna arborea*), Great Blue Heron (*Ardea Herodias*), Great Egret (*Egretta alba*), Common Moorhen (*Gallinula galeata*), Limpkin (*Aramus guaraúna*), Little Blue Heron (*Egretta caerulea*), Gray Kingbird (*Tyranus dominicensis*), Brown Pelican (*Pelecanus occidentalis*), and Osprey (*Pandion haliaetus*) (Annex A).

There is a report of a colony of Caribbean Coot (*Fulica caribaea*) in the lagoon, something which is unique for this species. Other studies have reported more than 6,000 individuals (Wege 2008), but in our trip we only observed 32. This is mainly due to the lack of an aquatic invasive plant *Hydrilla verticillata* that permitted the species to have more food and to not be bothered by fishermen or boats.

Among the species of birds that are vulnerable are Magnificent Frigatebird (*Fregata magnificens*), Limpkin (*Aramus guarauna*), Royal Tern (*Thalasseus maximus*), Clapper Rail (*Rallus longirostris*), and Least Tern (*Sterna antillarum*). Except for the latter species, whose conservation status is undetermined, the others are included in the vulnerable category (SEA/DVS 1990b). The White-crowned Pigeon (*Patagioenas leucocephala*) and the Plain Pigeon (*Patagioenas inornata*), also present here, are listed as vulnerable both nationally (SEA/DVS 1990b) and international (IUCN 2004).

2.3. Fish

Among the fish that can be found are the Tilapia (*Tilapia mossambica*), shad (*Prochilodus* sp.), sunfish, the mampetés, guabina, snook, mojarra, zago and coninús, among others.

Because this is one of the most important resources for the community of Los Guineos, the members of this community are the only ones that are allowed to fish commercially in this protected area. The Ministry for the Environment has issued licenses to individuals approved by the community and the government.

2.4. Amphibians and Reptiles

For the Miches zone we have reported the presence of 6 species of amphibians and 9 species of reptiles, although Hedges (2001) reports 11 amphibians and 20 reptiles in the area. Eight of these species of amphibians and 16 of the reptiles are endemic to Hispaniola (Annex B).

Among the reptiles, seven species are considered vulnerable. These are the green snakes (*Uromacer oxyrhynchus*), savanna snake (*Hypsirhynchus parvifrons*) and jicotea turtle (*Trachemys stejnegeri*). These species are included in the vulnerable category in regards their status of conservation in natural conditions (SEA/DVS 1990). According to reports the beaches are resting grounds for sea turtles like the leatherback (*Dermochelys coriacea*), the loggerhead (*Caretta caretta*), hawksbill (*Eretmochelys imbricata*) and the green turtle (*Chelonias mydas*). These species are included as vulnerable and in critical danger in the Red list of the International Union for the Conservation of Nature (IUCN 1998). In our field observations we observed the green turtle (Annex B).

2.5. Mammals

Evidence of Hutia (*Plagiodontia aedium*) is present in the northern limits of the reserve and in the Limón Beach area in the mangroves. More research should be conducted to determine their distribution and population numbers.

2.6. Geology

The principal geological formation in the area corresponds to undifferentiated quaternary fluvial deposits that are forming terraces and swamps. The Laguna Limón has a muddy bottom with an abundance of detritus. The sediments of the lowlands have been largely deposited by river currents, explaining the presence of marsh soils. The costal beaches are composed of coral originated sand that rest on the underlying coral rocks. Another formation represented in the area consists of a Flysch (a mixture with the presence of sandstone, loam, a conglomerate, and argillite).

2.7. Water Resources

The objective of the protected area declaration was to conserve the two major sized bodies of water of the eastern region, for scientific and environmental monitoring purposes.

The Laguna Limón has an area of 3.77 km². This lagoon receives fresh water from the streams and creeks that run down the northern slope of the Central Mountain Region. The Laguna Limón is more isolated by marine influence because its outflow is slightly above sea level.

The Laguna Limón forms part of a complex system of wetlands further composed of a subsystem of streams with some estuaries and a large area of swamp and marshes.

The Cuarón, Las Lisas, Nisibón, Cedro and Jovero rivers, and the Alcides, Alonso, Juana, La Jagua, Don Juan and Caño del Negro streams combine to discharge in the sea the water runoff from the surrounding mountains; a barrier of sand and mangroves prevents the outflow of the superficial runoff, which is then trapped in the lagoon and an extensive wetland area that serves as shelter for hundreds of species.

2.8. Climate

The climate is tropical rainy with normal precipitation generally over the 100 mm in every month, except in February that is relatively dry. In the Miches meteorological station the normal annual precipitation from 1961-2000 was that of 1,780 mm with an average of about 137 days of normal rain. In the same time period, the annual average for the median normal temperature was 25.6°C, with January being the coldest month (24.2°C), and July the warmest (27.0°C). This particular climate has its origins in the area of the Eastern Central mountain system that acts as a barrier to the trade winds coming from the Atlantic, determination the frequency and intensity of the rain that occurs in the zone.

2.9. Cultural Resources

No major cultural resource are known to exist in the Laguna Limón area. Although, a wall of shells accumulated by Tainos has been located on the shores of the Lagoon (Lopez personal communication).

3.0 PROJECT GOALS AND EXPECTED BENEFITS

The goal of the Kayak Limón project is to diversify the local economy in a way that protects the environment and provides for sustainability. Preliminary targets include hiring three to five kayak guides and producing a gross income of at least \$20 per day per guide (Evan Poirson, 2011).

To be sustainable, the project must not only be profitable, it must produce specific benefits to the environment, the local community, and visitors, and these benefits should be inter-related so that they reinforce each other (Annex C). This is the “triple bottom line.”

For example, the natural environment --primarily the lake and its flora and fauna-- should be appreciated, properly managed and protected by visitors and locals alike. Entrance fees paid by visitors can support the refuge; interpretive information can help people understand and respect the area’s biodiversity; and a healthy lake can then attract tourists and support local fishermen.

The community will not only benefit from the fish produced from the lake, but also from new tourism jobs and the income they generate. The community will also benefit from the cultural exchange from contact with international visitors. Although profits will not be large, they will be a new source of revenue and its effect will be multiplied as it circulates throughout the community. In addition, if tourists stay overnight at a local hotel, this additional income will benefit employees in these businesses. Successful hotels, as well as the presence of trained guides, will in turn attract and support visitors.

The third part of the equation is benefits to the visitors, because without satisfied customers you cannot have a sustainable tourism program. Visitors support conservation through entrance fees and donations to local environmental projects, and support the community through their purchases of lodging, food, guide services, and souvenirs. They also help maintain a steady flow of tourists through repeat visits and word-of-mouth advertising to friends (for more details on this see the community-based sustainable tourism model, Annex C).

4.0 RAPID ASSESSMENTS

A. Strengths, Weaknesses, Opportunities and Threats Analysis (SWOT)

Clearly, the primary attractions and strengths are the freshwater lagoon and its associated scenery, flora, and fauna and the adjacent beautiful beach. Other important elements include the nearby community of Los Guineos with its cadre of local fishermen, who ply the lagoons waters with their traditional wooden boats and nets, and the numerous community supporters assisted by a local Peace Corps volunteer and Columbia University. Two small hotels near the beach are good places to contact potential customers for ecotours on the lagoon.

However, there are many challenges to the development of a community-based ecotourism program. The primary problem is the somewhat limited potential for kayaking, lack of a defined kayak product and the uncertainty about how to manage the day-to-day logistics of moving people and equipment around the lake (A detailed assessment of kayaking opportunities is provided in Section C below.) Other significant limitations that must be addressed immediately include extremely poor road conditions and difficult access to the community, the beach hotels and the lagoon, a lack of information about local tourism, and a generally low level of preparation and training in receiving visitors.

Immediate and short-term opportunities for expanding local tourism include partnerships with the two local hotels, development of land-based tours for wildlife viewing and photography, and creation of locally-made souvenirs. Longer-term projects involving day trips from Punta Cana after the road is improved could include horse-back riding, mountain biking, and sport fishing.

The development of tourism at Laguna Limón could be threatened by environmental degradation, accidents or threats to visitors, the return of lake-choking floating weeds, and conflicts with large boat tour groups. The tourism program would also be seriously affected by the loss of the local Peace Corps volunteer.

An assessment of the area's strengths, weaknesses, opportunities and threats is summarized in Table I below.

Table I. Rapid Swot assesment summary for Refugio de Vida Silvestre Laguna Limón.

<p>Strengths</p> <ul style="list-style-type: none"> • Unique & attractive freshwater lake • Protected area status • Mangrove forest • Viewable wildlife – birds, fish, turtles • Adjacent attractive beach • Local community support • Peace Corps coordinator • Traditional fishermen with boats & nets • Hotels close to beach & lake 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Limited kayaking opportunities • Occasional strong current in canal • Roads in very poor condition • Limited signage • No trained guides • No interpretation • No landline phone or internet • No marketing image or logo • No foreign language skills • Most interesting areas on other side of lake • Windy conditions
<p>Opportunities</p> <ul style="list-style-type: none"> • Agreements with local hotel & tour operator • Interpretive nature tours • Nature photography with guides • Site-specific gifts and souvenirs • Hiking, biking & horse trails • Boardwalk trails & viewing tower • Catch & release fishing 	<p>Threats</p> <ul style="list-style-type: none"> • Deterioration of roadways • Deforesting & erosion around lagoon • Accidents and injuries • Degraded water quality • Invasive water weeds • Conflicts with large tour groups on lake • Loss of Peace Corps volunteer

B. Tourism Suitability, Readiness and Sustainability

An evaluation of the area's sustainability and readiness for tourism was conducted and the details are presented in Annex D.

Suitability relates to how realistic and appropriate tourism is for the community and is based on three factors: attractions, environmental conditions, and the community.

Attractions measures whether there is sufficient reward for time, effort and money invested by visitors; Environmental factors looks at limitations to tourism from nature or the government; and Community factors examine if tourism is a good fit for Los Guineos.

Readiness factors address planning and governance, access and information, customers, local capacity, information, and marketing.

Sustainability is not measured or numerically scored, but is important because it requires that there be specific, measurable benefits for the environment, the community, and visitors.

Two assessments were made using the same criteria, one by community members and the other by our team. The two numerical scores reflect the different perspectives of these two groups. It is to be expected that the community scored itself higher, 57 points out of a maximum of 75, whereas the team gave them a score of 32. The areas of greatest difference was in the quality of local attractions, community fit, planning, and availability of customers.

An overall score of 57 would place Laguna Limón in the "good to very good" range, whereas 32 is "marginal." Whatever the final score, it is important to keep in mind that this exercise is designed to identify areas where improvements need to be made to ensure a successful community-based sustainable tourism program.

C. Kayak Tourism Assessment

An evaluation of the area's potential for kayak tourism was conducted and the details are presented in Annex E. This was based on twelve criteria measuring factors such as wildlife, water quality, and natural attractions. The total score was 16 or 17 points out of a possible maximum of 37, which is one of the lowest of any of the locations we have worked. This suggests that Laguna Limón currently has a "low" potential for the development of kayak tours. However, this does not mean that kayak tours are not possible, only that certain issues need to be resolved.

Please note that this kayak assessment scoring system measures "kayak potential", not "kayak activity success". However, nearly all successful areas that we have evaluated score in the 20s. The lowest viable commercial ranking we have evaluated is 17 in San Francisco area in the USA and the lowest in the tropics is 19 in Belize, which is a huge success. In the northern coastal area in Honduras we scored a lagoon at "20" a few years ago that still does not have a viable kayak operation, even though they have good potential. Based on our assessments of several kayak locations over the years, we feel that a "potential" score of 17-20 is marginal and a score above 20 should be successful. Although, we have learned that "kayak success" is related more to following good management practices and solid implementation and not just "site potential".

One serious problem is the lack of a clearly defined paddling route with enough interesting attractions, such as wildlife and small waterways, to fill a two or three-hour tour. The canal from the lagoon to the beach would be an essential element of such a tour. However, this canal is only about 400 meters long and narrow, so that kayakers will have to pull to the side to avoid tour boats. Also, when it is open to the ocean, there is a strong outgoing current in the canal that may be too fast for kayakers to paddle against. This is said to occur several times a year and could be a serious problem. Alternate waterways through the mangroves will have to be explored and cleared to provide other paddling options and perhaps make a loop tour that brings people back to their starting point without backtracking.

Logistics is another serious issue: Where are the kayaks stored, where does the tour start/end, and how are the boats and people (guides and tourists) transported to and from the starting point? Organizing personnel and tourists, preparing and transporting boats and equipment, and cleaning and drying equipment is the majority of work involved with kayak tourism. The actual tours are the easiest part. Therefore, careful planning of logistical details is critical to a successful kayak program.

Our team conducted basic kayak guide training as part of this assessment. Over a 2-day period this training included basic navigation and paddling skills, safety for both guides and visitors, and emergency rescue techniques. In addition we practiced all basic paddling strokes and maneuvers.

D. Biodiversity Threats

Direct and Indirect Threats

Twelve biodiversity threats for the Refuge (this includes Laguna Redonda and Limón) were identified by Domínguez, et al., (2008). These include: agriculture expansion, agrochemical and toxic chemical use, erosion caused by improper land use, over fishing (and use of destructive, small mesh size nets), and taking pre-productive fish, tourism expansion, , invasive species (such as the presence of the invasive aquatic plant *Hydrilla verticillata*), illegal human trafficking, metal extract ion, and land disputes. In addition

In general two primary threats to biodiversity conservation in this area are the loss of forest habitat, including related species, and degraded water quality. Indirect threats include contamination from herbicides and insecticides from the adjacent agricultural plots, illegal hunting and fishing, introduction of invasive species, and wildfires on second growth land.

We do not anticipate threats to biodiversity conservation from recreational use of the refuge by small groups of kayakers. The effects of motorized boats on wildlife is outside the scope of this report. We did observe a recently burned area in the coconut grove and marsh near the canal, and although there is no hard data, we assume wildlife is also affected by illegal hunting and trapping.

These threats to biodiversity conservation are summarized in Figure 1.

Contributing Socio-economic Factors

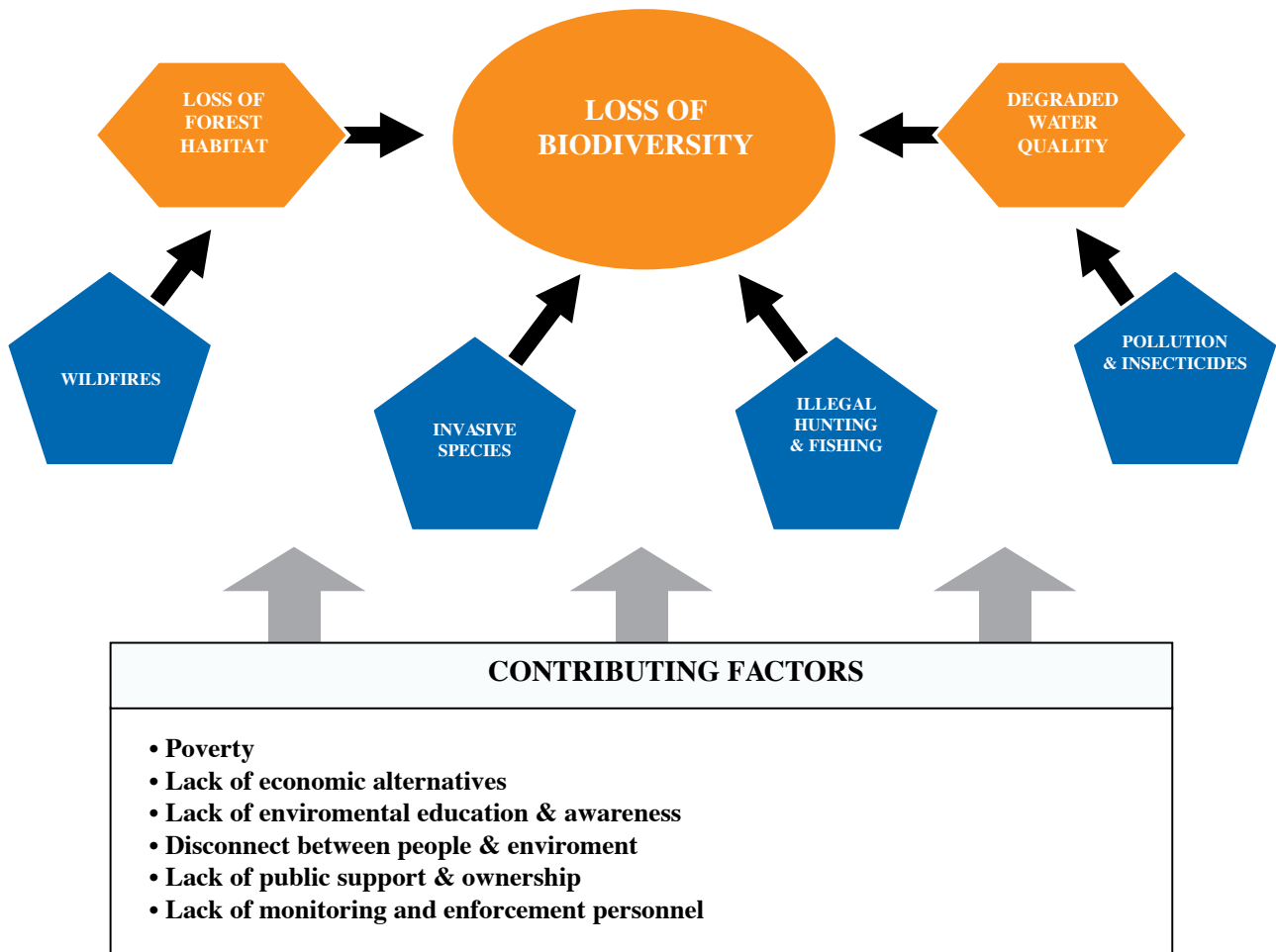
These threats affect Laguna Limón and the potential public use of the lagoon and can be modified by addressing the underlying socio-economic factors. These factors include poverty and the lack of economic alternatives for local fishermen, a general lack of environmental education and awareness, lack of public support and ownership of the refuge, and a lack of monitoring and law enforcement.

Coastal Climate Change

Coastal areas are especially vulnerable to climatic impacts. The effects of climate change and global warming could have significant effects to the lagoon primarily through a rise in sea level and storms. Stronger and more frequent storms can seriously damage or even destroy the mangrove and coconut plantations that serve as a buffer between the ocean and the lagoon. These storms and high waves could also permanently breach the sand bar that separates the lagoon from ocean, perhaps even changing the freshwater lagoon into a saltwater estuary. This would totally change the character of the refuge.

A fully functioning and healthy ecosystem in the lagoon, supported by a successful community-based ecotourism program, can help protect the vulnerable coastal zone and associated coral reefs from the effects of climate change and global warming. A healthy ecosystem can protect human health and safety by ensuring that the lagoon water remains clean and unpolluted; its forests prevent erosion helping to keep sediments from smothering fragile reefs and provides protection to the built environment during storms. In addition, ecotourism maintains livelihood opportunities and diversifies economic options for local communities. Consequently, the lagoon will play a key role in any strategy by the community to adapt to coastal climate changes.

Figure I. Direct and indirect threats and contributing factors at Laguna Limón.



5.0 RECOMMENDATIONS

Recommendation #1 - Kayak tourism

The number-one priority for kayak tourism is to develop a product with one or more tour routes of two to three hours duration and from 4 to 7 km in length. Because of the size of the lake and the generally strong winds, tours across the lake are not recommended. With the beach and other attractions on the north side of the lake, this would require the tour to start on that side.

To do this, alternate waterways through the mangroves should be explored and cleared to expand paddling opportunities and perhaps make a loop tour through the mangroves on the north shore. Consider opening the old overgrown canal that connects with the mouth of the present canal and extends about 600 m to the lake.

Map 3 shows the recommended area for kayaking and interesting points. This area needs to be explored in more detail so specific routes can be identified.

We recommend group size be limited to 6 single kayaks or 4 doubles for each tour until the effects of kayaking on birds can be assessed.

Logistics

After the tour routes are identified, a secure storage area should be developed for the kayaks. In the interim, however, it may be possible to chain the boats to a concrete structure or a large tree that cannot be easily cut. If guides are coming from the refuge office on the south shore, they have suggested towing two or three kayaks with a rowboat to the north shore to meet tourists there. This may be more difficult than they believe, and should be tested to see if this is feasible.

Target Markets

The eight thousand day-tourists coming from Punta Cana that transit the lake in large boats each year are not potential clients for a kayak tour because of the limited time they have available and due to the fact they are on a pre-arranged tour with no option for alterations. A more suitable target market is independent travelers coming from Miches or Punta Cana, or those staying in one of the two hotels near the beach. It would be easy to advertise the tours at these hotels, as well as hotels in Miches.

In addition, tourists could be attracted from Santo Domingo and other areas by linking with local tour operators to develop 2-3 day itineraries for the Miches area, that could include kayaking in the lagoon and other cultural and nature related activities.

Pricing

A two or three-hour guided tour in the USA would cost \$50-100 USD. However, comparative prices should be considered if they can be found in the Dominican Republic. Specific pricing cannot be determined until the routes have been established. We recommend, that once the tour routes are identified, to work with local tour operators to get their input on pricing.

Training

Before starting the kayak tours, more detailed training for local guides should be conducted. We recommend a 2-day workshop patterned after the American Canoe Association's Day Trip Leader (guide) program. This training should include basic paddling skills, safety issues, group control, and rescues.

In addition, the local Peace Corps Volunteer could give follow-up training on a more frequent basis, not only for kayaking, but also for guiding techniques.

Refuge Headquarters

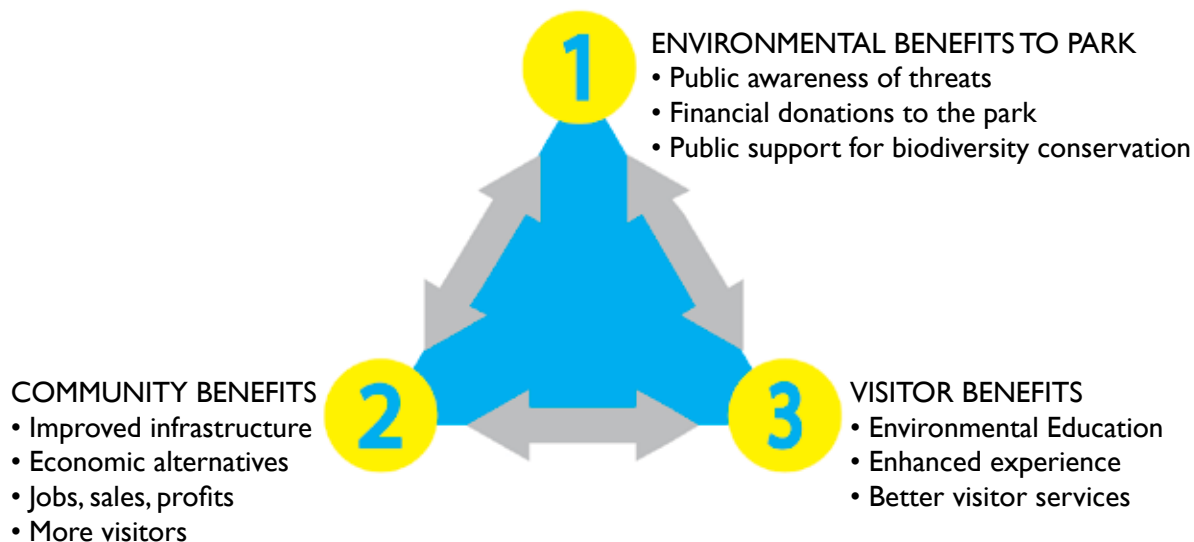
Improvements needed at the refuge office include repair to the wooden dock (or construction of a new dock) which is currently unsafe for visitor use, a simple sign and map to orient visitors, and a general clean-up of the site.

Recommendation #2 - Environmental Interpretation

Development of kayak routes and tours will, in itself, not be sustainable and provide benefits to the community if environmental (or heritage) interpretation and marketing (Recommendation #3 below) is not integrated into the project. As an example, Figure 2 illustrates how environmental interpretation and marketing can promote community and economic development and biodiversity conservation.

Promotional materials will increase the number of visitors to Laguna Limón. Increases in visitation in turn will provide more income and profits for community members, funds for community projects, and improvements in infrastructure, which will benefit both visitors and residents.

Figure 2. Summary of benefits resulting from interpretive program and marketing/promotional materials.



Visitor experiences will be enhanced through high-quality interpretation of the area's mangroves, lagoon ecosystem, wildlife, and history. This can be done through personal interaction with trained guides or through interpretive signs. We recommend a plan be prepared to define interpretive objectives, identify a central message and supporting messages, and determine where and how these can best be presented. In addition, interpretive training should be provided for all guides who conduct tours in the refuge.

For example, the central message could focus on the importance of mangroves, with various supporting sub themes, such as:

1. Mangroves protect the shoreline
2. Mangroves are a nursery for fish and birds
3. Mangroves clean the water
4. Birds and mangroves support each other

Possible interpretive objectives could include the following:

Intellectual

- Understand how mangroves are important (at least 3 ways)

Emotional

- Lose fear of mangrove
- Appreciate mangroves
- Have fun in mangroves
- Feel mangroves are beautiful

Behavioral

- Get people to visit mangroves
- Tell friends about their experience
- Repeat visits
- Purchase souvenirs
- Tip the tour guides
- Make donations (monetary or equipment) to the refuge

The refuge should develop information, materials and presentations for guided and kayak tours, such as waterproof fish and bird identification guides and trail maps (see souvenirs section below).

Recommendation #3 - Signage and Maps

A sign with a map to welcome and orient visitors to the refuge should be developed for the guard station site. In addition, page-size waterproof maps would be useful for the kayak tours (see souvenirs section below).

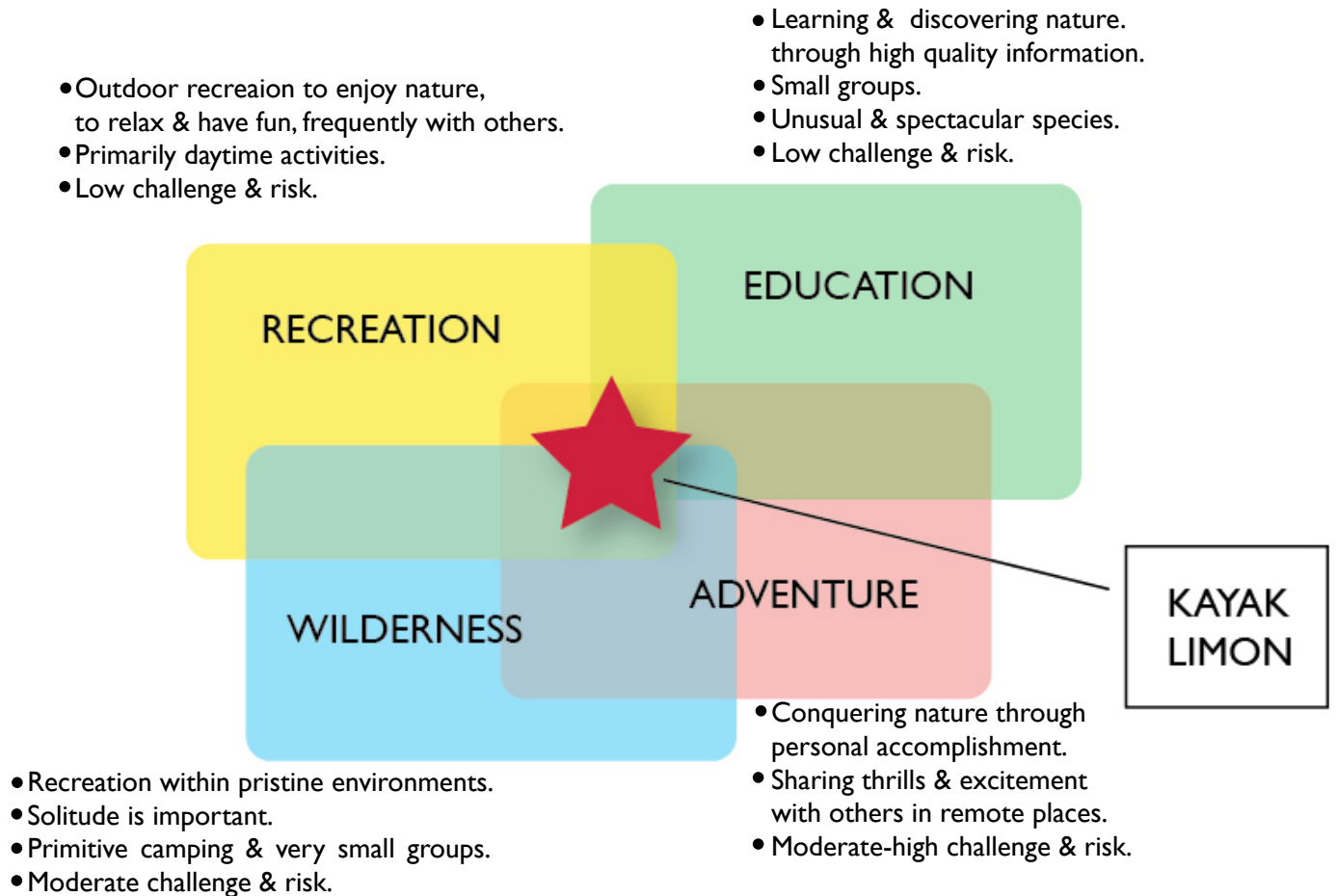
Recommendation #4 - Marketing

The Kayak Limón product must provide a range of satisfying experiences to meet the needs of both foreign and domestic tourists. These can range from simple outdoor recreation, to environmental education, adventure, and wilderness. The Kayak Limón product will be mostly recreational with some learning and a touch of adventure plus hint of wild nature (Figure 3).

As ecotourism programs are initiated it will be necessary to develop marketing strategies and products to create a greater awareness about the lagoon and to attract domestic and international visitors. In the short-term we recommend the following marketing actions (see Annex F for recommended marketing materials):

- Logo - Develop a standard logo or icon that gives the site a unique and attractive marketing identity.
- Fliers/Posters – Create page-size promotional fliers and larger posters for use in the two beach hotels and in Miches.
- Webpage - Develop a simple website to promote the refuge and ecotourism activities.
- Internet – Use social media (Trip Advisor, YouTube, Facebook,, etc) to promote the lagoon’s ecotourism activities
- Develop a multimedia CD on the refuge’s attractions.
- Guidebooks - Update existing descriptions of the park in published guidebooks.
- Google Earth - Upload a selection of high-quality photographs to suitable internet photo sharing websites such as Google’s “Panoramio.”

Figure 3. Location of the Kayak Limón project in relation to important niche markets.



Recommendation #5 - Souvenirs

In addition to the marketing materials, souvenirs can be developed as a means to help create awareness and to raise funds for the Kayak Limón program. All souvenirs offered for sale at the refuge should be locally-produced, support the goals of biodiversity conservation and environmental education, and help promote ecotourism. Before souvenirs are produced it must be decided who will market the souvenirs and how the funds will be managed and used.

In the short-term we recommend the following souvenir items (see Annex G for recommended souvenirs):

- Waterproof trail map for kayak tours
- Logo on T-shirts and baseball caps
- Field bird identification guide

As funds are generated other souvenir products can be produced, including calendars, post card set, bookmark, poster, note cards, , multimedia presentations, etc.

Recommendation #6 - Dominican Rural Tourism Network

The Kayak Limón project should participate in the Red Dominicana de Turismo Rural (REDOTUR, <http://redotur.org>). This consortium of rural ecotourism projects could offer many benefits to help start the ecotourism activities in Laguna Limón. Refer to the REDOTOUR web page for more detail on this network.

Recommendation #7 - Community Training Site Visits

A typical problem with developing community tourism is lack of experience, vision and knowledge of similar type of operations. The local community members have simply not had the exposure to other sites and in many cases really do not understand what it means to develop ecotourism activities. Thus, we recommend that site visits be established to ecotourism locations throughout the country. Sites in the REDOTUR network and those supported by the tourism clusters could be set up to give the community members the opportunity to learn from others and to develop their long-term vision.

6.0 MONITORING AND EVALUATION

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.

A. Biodiversity Conservation Indicators

- Less illegal fishing (qualitative)
- Fewer illegal activities such as hunting, fires, vandalism (qualitative)
- Number of volunteers for conservation projects
- Number of conservation projects completed
- Money collected from entrance fees to support the refuge

B. Community and Economic Development Indicators

- Money donated by visitors
- Money earned from souvenirs
- Number of trained guides
- Number of new private tourism businesses in the village
- New or improved infrastructure for locals and visitors

C. Visitor Demand and Satisfaction Indicators

- Number of total customers
- Number of website hits
- Number of visitor complaints
- Number of visitor compliments

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

PHOTOGRAPHS



Photo 1. Ministry of Environment guard station at Laguna Limón.



Photo 2. Sign at the guard station.



Photo 3. Dock in disrepair and local fishing boats near the guard station.



Photo 4. Fishermen association sign at entrance to guard station.



Photo 5. Access road to local hotels. This road has large mud holes when it rains, a 4x4 vehicle is needed to enter.



Photo 6. Hotel Rancho La Cueva near Laguna Limón.



Photo 7. Hotel Harley Heaven near Laguna Limón.



Photo 8. Boardwalk leading from Limón Beach to the lagoon. This is a safety hazard to visitors.



Photo 9. Boardwalk leading from Limón Beach to the lagoon. This is a safety hazard to visitors.



Photo 10. Small picnic structure on Limón Beach.



Photo 11. Jerry Wylie and Jerry Bauer during the ecotourism assessment.



Photo 12. Jerry Wylie and local guides, kayak guide training.



Photo 13. Jerry Wylie and local guides, kayak guide training.



Photo 14. Jerry Wylie and local guides rescue practice, kayak guide training.



Photo 15. Jerry Wylie and local guides rescue practice, kayak guide training.



Photo 16. Community guides practicing paddle strokes in the mangrove channel.



Photo 17. Jerry Wylie and community guides arriving at Limón Beach from the lagoon.



Photo 18. Birdwatching from a kayak can be an important activity for tourists.



Photo 19. Birdwatching from land near the lagoon can also be an attraction for tourists.



Photo 20. A local fisherman on the lagoon offers a picturesque scene for tourists.



Photo 21. Local fishermen using traditional fishing technique, slapping the surface with a paddle to scare fish into their net.



Photo 22. A crab trap made from local materials.



Photo 23. Local fisherman repairing his net.



Photo 24. Community members at the town meeting held with the assessment team.



Photo 25. Community members at the town meeting held with the assessment team.



Photo 26. The picturesque Limón Beach.



Photo 27. The picturesque Limón Beach.



Photo 29. Many birds can be seen on the lagoon and the nearby areas



Photo 28 .The pictures que Limón Beach.

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MAPS

Map 1. Location map of Refugio de Vida Silvestre Laguna Limón.



Map 2. Laguna Limón and the local communities.



Map 3. Potencial Kayak routes.



ANNEX A

LIST OF BIRDS OBSERVED IN THE MICHES AREA

ANEXO A. Lista de Aves Observadas en el área de Miches/ Taxonomía Basada en La American Ornithological Union, 2011 (Compilado por Jorge Brocca, Marzo 2012).

Orden	Familia	Nombre Científico	Nombre Vulgar	Estudio*						Categoría de Amenaza			Abundancia relativa				
				Brocca 2011 (Laguna Limón)	Brocca 2011 (Bahía Gina)	Steingard & Winchell	Brocca & Almonte 2009	SEA/DVS	UICN	CITES	Stotz	Abundancia relativa	Gremios tróficos				
Anatiformes	Anatidae	<i>Dendrocygna arborea</i>	Yaguaza	•					EN	VU			X	E	C		
		<i>Anas discors</i>	Pato de la Florida	•	∞					LC	LC			XN	C	C	
		<i>Anas bahamensis</i>	Pato de la Orilla			Δ				LC	LC			X	C	C	
Podicipediformes	Podicipididae	<i>Podilymbus podiceps</i>	Zaramagullón	•		Δ				LC			X	E	C		
		<i>Fregata magnificens</i>	Tijereta	•	∞	Δ			V	LC				X	O	C	
Pelecaniformes	Fregatidae	<i>Pelecanus occidentalis</i>	Pelicano	•	∞	Δ			V	LC			X	E	C		
		<i>Ardea herodias</i>	Garzón Cenizo	•	∞	Δ			I	LR				X	E	C	
		<i>Ardea alba</i>	Garza Real	•	∞	Δ			I	LC				X	C	C	
	Ciconiiformes		<i>Egretta thula</i>	Garza de Rizos	•	∞	Δ				LC			X	E	C	
			<i>Egretta tricolor</i>	Garza Tricolor	•	∞	Δ				LC				X	O	C
			<i>Bubulcus ibis</i>	Garza Ganadera	•	∞	Δ				LC				X	C	C
			<i>Butorides virescens</i>	Crá-Crá	•	∞	Δ				LC				X	PC	C
			<i>Nycticorax nycticorax</i>	Rey Congo	•		Δ				LC				X	O	C
			<i>Nyctanassa violacea</i>	Yaboa		∞					LC				X	PC	C
			<i>Egretta caerulea</i>	Garza Azul	•		Δ				LC				X	E	C
Falconiformes	Threskiornithidae	<i>Plegadis fasinellus</i>	Coco Prieto			Δ			V	LC			X	PC	C		
	Cathartidae	<i>Cathartes aura</i>	Aura Tiñosa	•	∞	Δ				LC	AP-II		X	A	Gr		
		<i>Pandion haliaetus</i>	Guincho	•	∞	Δ				LC	AP-II		X?	PC	C		
	Accipitridae	<i>Accipiter striatus</i>	Guaraguato de Sierra			Δ				LC	AP-II		X	E	C		
		<i>Buteo jamaicensis</i>	Guaraguao			Δ				LC	AP-II		X	E	C		
		<i>Falco sparverius</i>	Cuyaya	•	∞	Δ				LC	AP-II		X	A	C		
	Falconidae	<i>Falco peregrinus</i>	Halcón Peregrino	•						LC	AP-II		XN	PC	C		

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Cathartidae	<i>Cathartes aura</i>	Aura Tuiñosa					Δ	◊	LC	AP-II	X	A	Cr
Falconiformes	Pandionidae	<i>Pandion haliaetus</i>	Guincho	•	∞	Δ	◊	LC	AP-II	X?	PC	C	
	Accipitridae	<i>Accipiter striatus</i>	Guaraguaito de Sierra			Δ		LC	AP-II	X	E	C	
		<i>Buteo jamaicensis</i>	Guaraguao			Δ	◊	LC	AP-II	X	E	C	
	Falconidae	<i>Falco sparverius</i>	Cuyaya	•	∞	Δ	◊	LC	AP-II	X	A	C	
		<i>Falco peregrinus</i>	Halcón Peregrino	•				LC	AP-II	XN	PC	C	
		<i>Porphyrion martinica</i>	Gallareta Azul	•	∞	Δ	◊	LC		X	O	I,F	
		<i>Gallinula galeata</i>	Gallareta Pico Rojo	•	∞	Δ	◊	LC		X	A	I,F	
	Gruiformes	<i>Fuica caribea</i>	Gallareta Pico Blanco	•	∞			LC		X	A	I,C	
		<i>Fulica americana</i>	Gallareta Pico Blanco	•				LC		X	A	I,C	
		<i>Aramus guarana</i>	Carrao	•	∞			LC	NT	X	E	I,C	
		<i>Numida meleagris</i>	Guinea							XI	E	I,F,G	
	Galliformes	Charadriidae	<i>Charadrius vociferus</i>	Tiito	•	∞	Δ	◊	LC		X	E	I
		Recurvirostridae	<i>Himantopus mexicanus</i>	Viuda					LC		X	C	I
		Jacaniidae	<i>Jacana spinosa</i>	Gallito de Agua			Δ		LC		X	C	I
		Laridae	<i>Sternula antillarum</i>	Charrán Menor	•	∞			LC		X	PC	C
			<i>Thalasseus sandvicensis</i>	Charrán Piconegro		∞			LC		X	E	C
<i>Hydroprogne caspia</i>			Charrán Piquiroja			Δ		LC		X	E	C	
Scolopacidae		<i>Thalasseus maximus</i>	Charrán Real	•		Δ		LC		X	E	C	
		<i>Tringa flavipes</i>	Patas Amarillas Menor	•			◊	LC		XN	E	I	
		<i>Actitis macularia</i>	Playerito Manchado		∞		◊	LC		XN	E	I	
	<i>Arenaria interpres</i>	Playero Turco	•	∞			LC		XN	E	I		
	<i>Colidris alba</i>	Playerito Blanquito	•			◊	LC		XN	E	I		
	<i>Patagioenas squamosa</i>	Paloma Turca			Δ		LC	NT	X	E	G		
	<i>Patagioenas inornata</i>	Paloma Ceniza				◊	VU	VU	X	E	G		
	<i>Patagioenas leucocephala</i>	Paloma Coronita	•	∞			V	VU	X	C	G		
Columbiformes	<i>Zenaidia asiatica</i>	Rolón Aliblanca	•	∞		◊	LC		X	A	G		
	<i>Zenaidia aurita</i>	Rolón Turco	•	∞		◊	LC		X	PC	G		
	<i>Zenaidia macroura</i>	Rabiche	•	∞		◊	LC		X	C	G		
	<i>Columbina passerina</i>	Rolita	•	∞		◊	LC		X	C	G		

ANEXO A. Lista de Aves Observadas en el área de Miches/ Taxonomía Basada en La American Ornithological Union, 2011 (Compilado por Jorge Brocca, Marzo 2012).

Cuculiformes	Cuculidae	<i>Coccyz americanus</i>	Pájaro Bobo Pico Amarillo	∞	Δ	∅	LC	X	O	C, J
		<i>Coccyz minor</i>	Pájaro Bobo Menor	•	Δ	∅	LC	X	C	C, J
		<i>Coccyz longirostris</i>	Pájaro Bobo	•	Δ	∅	LC	XR	A	C, J
		<i>Crotaphaga ani</i>	Judio	•	Δ	∅	LC	X	A	C, J
Strigiformes	Tytonidae	<i>Tyto glaucops</i>	Lechuza Cara Ceniza		Δ	∅	LC	XR	C	C
		<i>Tyto alba</i>	Lechuza Cara Blanca		Δ	∅	LC	XR	C	C
Caprimulgiformes	Caprimulgidae	<i>Chordeiles gunlachii</i>	Querebebe		∅	∅	LC	X	E	I
		<i>Tachornis phoenicobia</i>	Vencejito Palmer	•	∅	∅	LC	X	C	I
Apodiformes	Apodidae	<i>Anthracoceros dominicus</i>	Zumbador Grande	•	Δ	∅	LC	XR	C	I, N
		<i>Mellisuga minima</i>	Zumbadorcito	•	Δ	∅	LC	XR	A	I, N
Coraciiformes	Todidae	<i>Todus subulatus</i>	Barrancolí	•	Δ	∅	LC	XR	E	I
		<i>Ceryle alcyon</i>	Martín Pescador	•	∅	∅	LC	XR	E	C
Piciformes	Picidae	<i>Nesocittes micromegas</i>	Carpintero de sierra		Δ	∅	NT	XR	C	I, F
		<i>Melanerpes striatus</i>	Carpintero	•	Δ	∅	LC	XR	A	G, F, J
		<i>Contopus hispaniolensis</i>	Maroíta		∅	∅	LC		O	I, F
		<i>Tyrannus dominicensis</i>	Petigre	•	Δ	∅	LC	X	A	I
		<i>Myiarchus stolidus</i>	Manuelito		∅	∅	LC			I, F
		<i>Vireo altiloquus</i>	Julián Chiví	•	Δ	∅	LC	X	C	I, F
		<i>Corvus leucognathus</i>	Cuervo		Δ	∅	EN	XR	E	O
		<i>Petrochelidon fulva</i>	Golondrina de Cuevas	•	Δ	∅	LC	X	C	I
		<i>Hirundo rustica</i>	Golondrina Cola de Tijera		∅	∅	LC	XR	E	I
		<i>Turdus plumbeus</i>	Chua-chuá	•	Δ	∅	LC	X	O	O
		<i>Mimus polyglottos</i>	Ruiseñor	•	Δ	∅	LC	X	C	O
		<i>Dulus dominicus</i>	Cigua Palmera	•	Δ	∅	LC	XR	A	F
		<i>Setophaga americana</i>	Cigüita Setophaga	•	Δ	∅	LC	XR	O	I
		<i>Setophaga tigrina</i>	Cigüita Tigrina	•	∅	∅	LC	XR	E	I
		<i>Setophaga caerulescens</i>	Cigüita Azul	•	∅	∅	LC	XR	A	I
		<i>Setophaga discolor</i>	Cigüita de los Prados	•	∅	∅	LC	XR	O	I
		<i>Setophaga palmarum</i>	Cigüita Palmer	•	∅	∅	LC	XR	PC	I
		<i>Mniotilta varia</i>	Pegapalo		Δ	∅	LC	XR	O	I
		<i>Setophaga ruticilla</i>	Bijirita	•	∅	∅	LC	XR	A	I
		<i>Seiurus aurocapilla</i>	Cigüita Saltarina	•	∅	∅	LC	XR	A	I
		<i>Parkesia motacilla</i>	Cigüita del Río	•	Δ	∅	LC	XR	C	I
		<i>Geothlypis trichas</i>	Cigüita Enmascarada	•	Δ	∅	LC	XR	O	I
Coerebidae	Coerebidae	<i>Coereba flaveola</i>	Cigüita Común	•	Δ	∅	LC	X	A	N, J
Thraupidae	Thraupidae	<i>Phaenicophilus palmarum</i>	Cuatro Ojos	•	Δ	∅	LC	XR	A	G, F, J
Emberizidae	Emberizidae	<i>Tiaris bicolor</i>	Juana Maruca		Δ	∅	LC	X	PC	G
		<i>Tiaris olivaceus</i>	Cigüita de Hierba	•	∅	∅	LC	X	E	G
		<i>Loxigilla violacea</i>	Gallito Prieto		Δ	∅	LC	X	E	F
Icteridae	Icteridae	<i>Quiscalus niger</i>	Chinchilín	•	Δ	∅	LC	X	A	O
		<i>Icterus dominicensis</i>	Cigua Canaria	•	Δ	∅	VU	XR	A	G, F, J
Ploceidae	Ploceidae	<i>Ploceus cucullatus</i>	Madam Sagá	•	∅	∅		XI	E	G

*Estudio

•
∞
Δ
∅

Brocca 2011 = Especies registradas en el trabajo de campo por Jorge Brocca y equipo 2011 & 2012
 Brocca 2011 = Especies registradas en el trabajo de campo por Jorge Brocca y equipo 2011 & 2012
 Steingard & Winchell 2010
 Brocca & Almonte 2009
 Stotz (BDATA) República Dominicana

Key to Codes in Table

I. Especies amenazadas

De acuerdo con la clasificación de las categorías de especies amenazadas de la IUCN se tienen en cuenta las siguientes categorías:

- **Extinto (EX)**: Cuando no queda duda alguna que el último individuo ha muerto.
- **Extinto en Estado Silvestre (EW)**: Cuando una especie sólo sobrevive en cultivo, en cautiverio o como población naturalizada completamente fuera de su distribución original.
- **En Peligro Crítico (CR)**: Cuando enfrenta un riesgo extremadamente alto de extinción en estado silvestre en el futuro inmediato.
- **En Peligro (EN)**: Cuando no estando “En Peligro Crítico”, enfrenta un alto riesgo de extinción o deterioro poblacional en estado silvestre en el futuro cercano.
- **Vulnerable (VU)**: Cuando la mejor evidencia disponible indica que enfrenta un moderado riesgo de extinción o deterioro poblacional a mediano plazo.
- **Casi Amenazado (NT)**: Cuando ha sido evaluado según los criterios y no los satisface para las categorías anteriores, pero está cercano a calificar como “Vulnerable”, o podría entrar a dicha categoría en un futuro cercano.
- **Preocupación Menor (LC)**: Cuando habiendo sido evaluado, no cumple ninguno de los criterios que definen las categorías anteriormente expuestas. Equivale a fuera de peligro.

2. SEA/DVS, 1990/2011

- **Extinto (EX)** - Una especie está extinta cuando su reporte no ha sido confirmado en los últimos 50 años.
- **En Peligro (EN)** - Un taxón está En Peligro cuando su supervivencia es improbable si los factores causales continúan operando. Se incluye en este taxón aquellos que tienen números reducidos a nivel crítico y cuyo hábitat ha sido tan drásticamente reducido.
- **Vulnerable (VU)** - Una especie es Vulnerable cuando existe la posibilidad de que se mueva a la categoría de En Peligro de Extinción en el futuro cercano, si los factores causales continúan operando.
- **Rara (R)** - Un especie se considera Rara cuando tiene poblaciones mundiales pequeñas que no se encuentran actualmente En Peligro de Extinción o Vulnerable, pero en riesgo. Generalmente se encuentran localizadas en áreas geográficas o hábitats restringidos o son de escasa distribución sobre un territorio amplio.
- **Indeterminado (I)** - Taxa que se sospecha pertenece a una de las siguientes categorías: Extinto, En Peligro o Vulnerable, pero para los cuales la información actual disponible es insuficiente.

3. Especies Reguladas por Convención sobre Comercio internacional de Especies Amenazadas de Fauna y Flora Silvestre (CITES)

Apéndice (I)

Incluye todas las especies En Peligro de Extinción que son o pueden ser afectadas por el comercio. El comercio de especímenes de estas especies deberán estar sujetas a una reglamentación particularmente estricta a fin de no poner en peligro aún mayor su supervivencia y se autorizará sólo bajo circunstancias excepcionales.

Apéndice (II)

A. Todas las especies que, si bien en la actualidad no se encuentran necesariamente En Peligro de Extinción podrían llegar a esa situación a menos que el comercio en especímenes de dichas especies este sujeto a una reglamentación estricta a fin de evitar utilización incompatible con su supervivencia; y

B. Aquellas otras especies no afectadas por el comercio, que también deberán sujetarse a reglamentación con el fin de permitir un eficaz control del comercio en las especies a que se refiere el subpárrafo (a) del presente párrafo.

4. Estatus poblacional

- A: Abundante, registrado en gran número durante todo el tiempo de muestreo en todos o casi todos los tipos de hábitat o muy abundante en un tipo de hábitat.
C: Común, sólo en algunos tipos de hábitat y registrado durante el 75% del tiempo de muestreo.
PC: Poco Común, en números bajos, registrado durante el 50% del tiempo del muestreo en algunos tipos de hábitat.
E: Escaso, registrado sólo algunas veces, 30% del tiempo de muestreo y en números muy bajos (unos pocos individuos durante todo el tiempo de muestreo).
O: Raros o ocasionales, Menos de dos registros totales durante todo el tiempo de muestreo.

5. Para cada especie caracterizamos el estatus de población utilizando la metodología descrita por Stotz:

- X: Especie reproductor
XN: Especie regular no-reproductor
XR: Especie endémica reproductora
XI: Especie introducida

6. Para la identificación de la avifauna se usaron las siguientes guías:

1. Latta S. 2006, Aves de la República Dominicana y Haití Princeton University Press.
2. Raffaele H, 1998, A guide to the birds of the West Indies Princeton University Press.
3. National Geographic Society, 2002, Field Guide to the Birds of North America
4. Jon Dunn / Kimball Garret, 1997 Peterson Field Guides "Warblers".

7. Gremio trófico:

- Grupo de especies que explota la misma clase de recursos alimentarios de forma similar (Baillie et al, 1986).
G: Granívora ; F: Frugívora | I: Insectívora ; N: Nectívoro ; O: Ovívoro

ANNEX B

AMPHIBIANS AND REPTILES FOUND IN THE MICES AREA

ANEXO B. Lista de Herpetofauna Observada en el área de Miches (Compilada por Jorge Brocca, Marzo 2012)

Familia		Especie	Nombre Común	Estatus	Ocurrencia	BH*	JB*	UICN	SEA/DVS	CITES
Anfibios										
1	Bugonidae	Rhinella marina	Miaco Pempen	Introducida	Común	•	X			
2	Ranidae	Rana catesbeiana	Miaco Toro	Introducida	Común	•	X			
3	Hylidae	Hypsiboas helliprini	Rana Arborícola Verde	Endémica	Rara	•		Vulnerable		
4		Osteopilus pulchilineatus	Rana Arborícola Amarilla	Endémica	Rara	•		En Peligro		
5		Osteopilus vastus	Rana Arborícola Gigante	Endémica	Rara	•		En Peligro		
6		Osteopilus dominicensis	Rana Arborícola	Endémica	Común	•				
7	Leptodactylidae	Eleutherodactylus abbotti	Calcalí	Endémica	Común	•	X			
8		Eleutherodactylus flavescens	Calcalí	Endémica	Común	•	X	Casi Amenazado		
9		Eleutherodactylus inoptatus	Calcalí	Endémica	Rara	•	X			
10		Eleutherodactylus ruthae	Calcalí	Endémica		•	X	En Peligro		
11		Eleutherodactylus weinlandi	Calcalí	Endémica	Rara	•				
Reptiles										
12	Teiidae	Ameiva chrysolema	Lagartija	Endémica	Rara	•				
13		Ameiva taeniura	Lagartija	Endémica	Rara	•				
14	Anguidae	Celestus costatus	Lucio	Endémica	Rara	•				
15		Celestus stenurus	Lucio	Endémica	Rara	•				
16	Sphaerodactylidae	Sphaerodactylus darlingtoni	Salamanquejita	Endémica	Rara	•				
17		Sphaerodactylus difficilis	Salamanquejita	Endémica	Común	•	X			
18		Hemidactylus haitianus	Geco	Introducida	Común	•	X			
19	Iguanidae	Anolis chlorocyanus	Lagartija	Endémica	Común	•				
20		Anolis cybotes	Lagartija	Endémica	Común	•	X			
21		Anolis semilineatus	Lagartija	Endémica	Rara	•	X			
22		Anolis olissoni	Lagartija	Endémica	Rara	•	X			
23		Anolis distichus	Lagartija	Nativa	Común	•	X			
24		Leiocephalus lunatus	Mariguanita	Endémica	Rara	•				
25		Leiocephalus personatus	Mariguanita	Endémica	Rara	•	X			
26	Boidae	Epicrates striatus	Boa de la Hispaniola	Nativa	Rara	•	X		Vulnerable	AP-II
27	Dipsadidae	Hypsirhynchus parvifrons	Culebra Sabanera	Endémica	Común	•	X		Vulnerable	
28		Uromacer oxyrhynchus	Culebra Verde	Endémica	Común	•	X		Vulnerable	
29	Tropidophidae	Tropidophis haetianus	Falsa Boa	Nativa	Rara	•				AP-II
30	Typhlopidae	Typhlops pusilla	Víbora	Endémica	Rara	•				
31	Cheloniidae	Caretta caretta	Caguamo	Nativa	Rara	•		Vulnerable	En peligro	AP-I
32		Chelonia mydas	Tortuga Verde	Nativa	Común	•	X	Vulnerable	En peligro	AP-I
33		Eretmochelys imbricata	Carey	Nativa	Rara	•		Criticamente en Peligro	En peligro	AP-I
34	Dermodochelyidae	Dermodochelys coriacea	Tinglar	Nativa	Rara	•		Criticamente en Peligro	En peligro	AP-I
35	Emydidae	Trachemys stejnegeri	Tortuga terrestre	Endémica	Común	•	X		Vulnerable	

*Fuente: • BH = Blair Hedges 2011 ; • JB = Jorge Brocca 2011

ANNEX C

SUSTAINABLE TOURISM MODEL

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 % of jobs conservation-related
- Income
- Profits
- Taxes
- Infrastructure for locals 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

ANNEX D

TOURISM SUITABILITY, READINESS AND SUSTAINABILITY

IS TOURISM RIGHT FOR YOU?

A Checklist for Suitability, Readiness and Sustainability

We should not assume that tourism is a realistic option for everyone. However, most tourism development systems jump over this critical issue and immediately start the planning process. The first question should not be “How can I develop tourism?” but “**Is tourism realistic and appropriate?**”

First, before you start down the tourism road, there are three primary or *suitability* factors to consider: **Attractions, Environment, and Community**. These are independent variables and largely unchangeable. Without this solid foundation, a sustainable tourism industry cannot be built.

If you are already in the tourism planning phase, other factors can help evaluate *readiness*. However, readiness is dependent upon things that can change; for example, training, information, or technical support.

If you already have a tourism program, there are several things to consider to determine whether or not tourism is *sustainable*. These involve delivering long-term benefits to the community, businesses, natural and cultural resource conservation, and benefits to visitors as part of a community-based sustainable tourism model.

Each of these sets of characteristics is described below and summarized in the attached checklist. In the future it may be possible to assign numerical values to these factors to help measure and compare rankings. However, at this stage numerical scores are provided for review and comment and field testing only.

SUITABILITY FACTORS

Can basic conditions support tourism?

A. ATTRACTIONS...Is there sufficient “pay-off” for visitors’ time, effort and expense?

- Are your natural and cultural attractions unique and authentic?
- Is the scenery attractive?
- Is there a variety of recreational activities and settings?
- Is there a “critical mass” of attractions in the area to pull and hold visitors?
- Are they primary (the main reason to come) or secondary attractions?
- Do you have “charismatic megafauna” or “esoteric microfauna”?
- Do you have a “park” or other type of protected area?
- Does your area have a distinct “sense-of-place”?
- Do you have “lemons” (negatives) that can be turned into “lemonade” (positives)? (For example, remote and difficult access = “undiscovered and uncrowded.”)

B. NATURAL & REGULATORY ENVIRONMENT... There are no serious limitations due to:

- Climate (wet/dry seasons)
- Insects and disease
- General health conditions and trash
- Regulations that could limit or delay tourism development generally
- Restrictions on access or commercial use in protected areas
- Excessive government fees or taxes for tourism businesses

C. COMMUNITY VALUES... Is tourism a good “fit” for your community?

- Is tourism consistent with cultural values and community goals, priorities, and plans?
- Are community attitudes towards tourists positive and supportive?
- Is there a tradition of hosting visitors?
- Would tourism support or degrade cultural traditions and way of life?
- Is there support for tourism by traditional, religious and political leaders?
- Is there a good customer service attitude?
- Is there a sufficient and predictable labor pool?
- Is the community ready for changes brought by tourism?
- Are there ethnic/religious conflicts or conflicting uses?

READINESS FACTORS

Are you ready for tourism?

D. PLANNING & GOVERNANCE... Is there good planning, organization & leadership?

- Vision for tourism supported by all stakeholders
- General goals and specific objectives (benefits desired)
- Comprehensive plan with action items
- Sufficient organization and leadership to plan, develop, and operate a tourism program

E. ACCESS & INFRASTRUCTURE... Is there good access & tourism infrastructure?

- Is your access convenient, predictable, and attractive?
- Can visitors do it on their own or do they need tour guides?
- Are there visitor services, such as food, lodging, water, communication, power/fuel, medical care, restrooms, garbage disposal?
- Do you have an inventory of your attractions and infrastructure?

F. CUSTOMERS & COMMERCE... Are there customers and commercial opportunities?

- Can you attract sufficient numbers of visitors?
- Are you on the way to other established tourism sites?
- Do you appeal to specific market niches? (bird-watchers, kayakers, fishermen, etc.)

- Is there something for visitors to spend their money on? (food, guides, lodging, souvenirs, transportation, etc.)
- Do you have information on who your current/potential visitors are?

G. LOCAL CAPACITY...Is there sufficient expertise available?

- Tourism planning
- Business/Financial
- Marketing
- Tour guides
- Language
- Interpretation
- Environmental assessment
- Emergencies and first-aid

H. INFORMATION...Is there scientific/technical or traditional knowledge available to support proper visitor information and interpretation and enhance the total visitor experience? Do you currently have:

- Signs
- Maps
- Visitor guide (brochures)
- Trailside displays
- Kiosks
- Visitor centers

I. MARKETING & IMAGE...Do customers know who and where you are, what you offer, & how it differs from your competition?

- Marketing position statement
- Marketing plan
- Tourism website
- Advertising fliers/brochures
- Logo
- Press kit
- Familiarization Tour
- Clear image as a tourism destination

NUMERICAL RANKING FOR SUITABILITY & READINESS

1. Assign points for each variable:

- 0 – None
- 1 – Little/poor
- 2 – Some/moderate
- 3 – Good
- 4 – Very Good
- 5 – Excellent (best in region/country)

2. Multiply the first 3 “core” variables (A-C) by 3 to emphasize their importance.

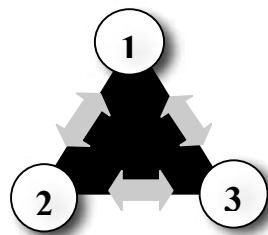
Suggested Scores	
<u>Minimum Suitability Score</u>	= 24 Points [(A+B+C) x 3]
<u>Minimum Readiness Score</u>	= 17 Points [D thru I]
<u>Total Score Values</u>	
Marginal	< 44 points
Good-Very Good	45-60 points
Excellent	> 61 points
Maximum	75 points

SUSTAINABILITY

Can tourism deliver long-term benefits?

Does tourism deliver long-term benefits for the community, businesses, visitors, and the natural and cultural resources that attracts and supports tourism? And do the three inter-related goals of Conservation, Community & Economic Development, and Quality visitor experiences support each other?

Community-based Sustainable Tourism Model



Sustainable Tourism Goals

- 1. Conservation/Biodiversity**
- 2. Community & Economic development**
- 3. Quality visitor experiences**

1. 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.

2. *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.

3. *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.

CHECKLIST FOR SUSTAINABLE TOURISM

Give each factor a score of 0 to 5 points (5 being best)

<u>SUITABILITY FACTORS...Can you have tourism?</u>	<u>Score*</u>
	C - AT
A. Attractions - Is there sufficient “pay-off” for visitors’ investment of time, effort and money? Attractive scenery? Unique and authentic nature & culture?	5 • 3
B. Natural & Regulatory Environment – There are no serious limitations to tourism due to environmental conditions or government regulations.	4 • 3
C. Community values - Is tourism a good fit for your community? Consistent with the cultural values and community goals and priorities? Supported by traditional, religious and political leaders?	5 • 3
Sub Total	14 • 9
Suitability Score - Multiply sub total by 3. A minimum acceptable score is 24 points A minimum acceptable score is 24 points	42 • 27

READINESS FACTORS...Are you ready for tourism?

A. Planning & Governance – Is there good planning, organization, and leadership?	3 • 1
B. Access & Infrastructures – Is there good access and tourism infrastructure?	1 • 0
C. Customers & Commerce – Do you have customers and business opportunities?	5 • 2
D. Local Capacity – Is there professional expertise?	3 • 2
E. Information – Is there good visitor information and interpretation?	3 • 0
F. Marketing & Image – Do prospective customers know you?	0 • 0

Readiness Score – A minimum acceptable score is 17 points	15 • 5
--	---------------

Total Suitability + Readiness – Less than 44 points is “marginal”, 45-60 points is “good to very good”, & 61 points or greater is “excellent”	57 • 32
--	----------------

SUSTAINABILITY...Will tourism last?

Be sure your tourism program has identified specific long-term benefits in the planning process and can achieve the following inter-related goals:

1. **Conservation/Biodiversity**
2. **Community& Economic Development**
3. **Quality Visitor Experiences**

A suitability audit would help you measure specific benefits achieved.

*Note: C = community score is on the left, AT = assessment team score is on the right

ANNEX E

LAGUNA LIMÓN KAYAK ASSESSMENT

LAGUNA LIMÓN KAYAK TOURISM ASSESSMENT

The following numerical system rates the area's potential for successful kayak tourism based on 12 criteria. The scale is 0-None, 1-Low, 2-Moderate, 3-Very Good, 4-Excellent, 5-Best in world (rare). Points are subtracted for serious negatives such as trash, conflicts with other users, and poor access to water. The maximum value is 37 points for truly "world-class" paddling destinations.

- A. Watchable wildlife includes birds, turtles, and fish. Score = 3 points.
- B. Water Quality is very good. Score = 3
- C. Scenic Quality is very good. Score = 3
- D. Safety and Comfort is very good. Score = 3
- E. Cultural and Historic Attractions are limited to traditional fishermen. Score = 1
- F. Natural Attractions are moderate to very good (at beach). Score = 2 to 3
- G. Diversity of paddling opportunities is moderate. Score = 2
- H. Other recreational opportunities are moderate (at beach). Score = 2
- I. Conflicts with other users is a potential problem. Minus 1
- J. Accessibility to water is poor and limited. Minus 1
- K. Trash is a problem along the shore. Minus 1

TOTAL SCORE = 16-17 points

Comparison with other similar kayak destinations

- 22 points – Guanaja Island, Honduras
- 21 points – Bogue Lagoon, Jamaica
- 20 points – Cuero y Salado Wildlife Refuge, Nicaragua
- 19 points – Laguna Bavaro, Dominican Republic
- 18 points – La Caleta, Dominican Republic
- 14 points – Pearl Lagoon, Nicaragua
- 9 points – Utila Island, Honduras

ANNEX F

SUGGESTED DESIGNS FOR MARKETING MATERIALS

LOGO

KAYAK LAGUNA LIMÓN





Contactos

Tel.: 809.000.0000

Email: necesitamos@lagunalimon.com

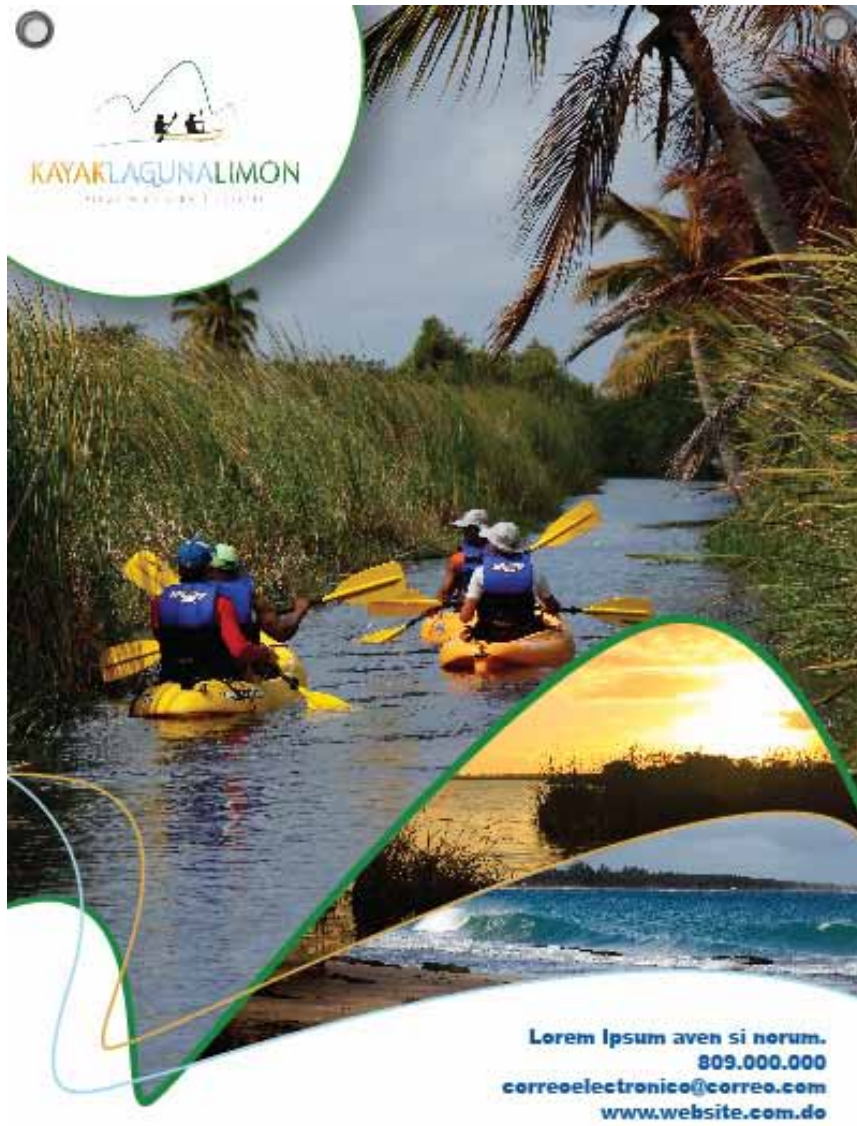
Website: www.lagunalimon.com.do



Dimensions: 18" x 22" inches / Other logos can be included if necessary

MARKETING

BANNER

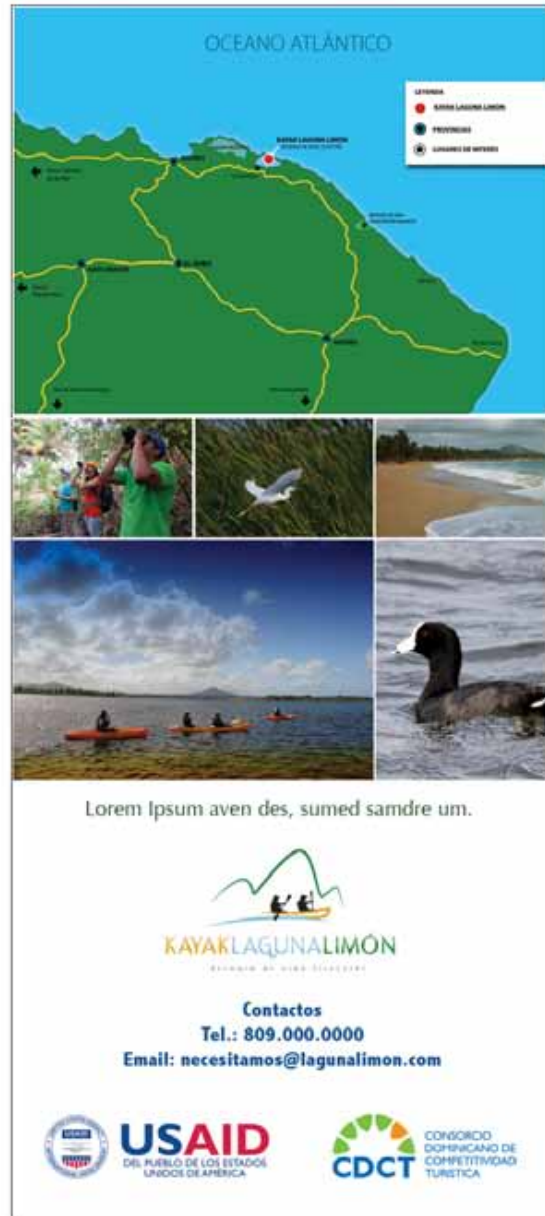
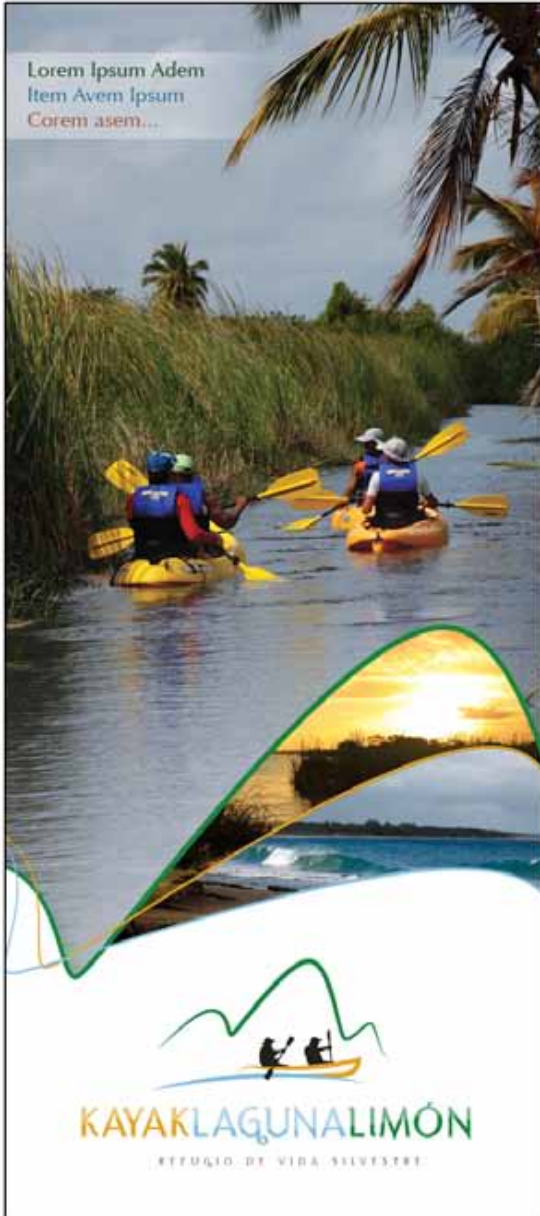


Stand Spider

Dimensions: 4' x 6' feet / Other logos can be included if necessary

MARKETING

RACK CARD



Dimensions: 9" x 4" inches

ANNEX G

SUGGESTED DESIGNS FOR SOUVENIRS



Dimensions: 1.5" x 5" inches

SOUVENIRS

POLO-SHIRTS



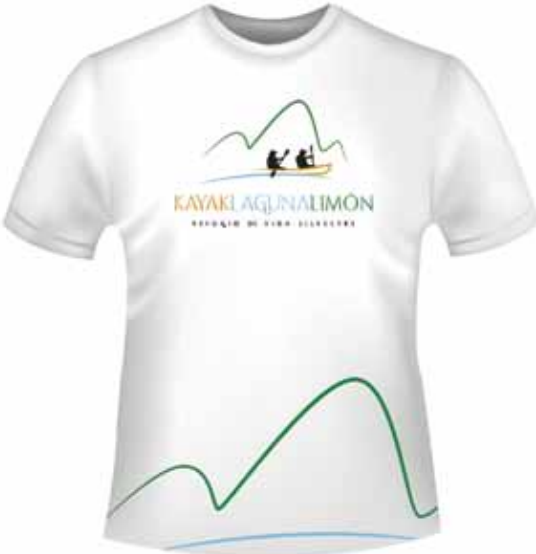
MALE T-SHIRT



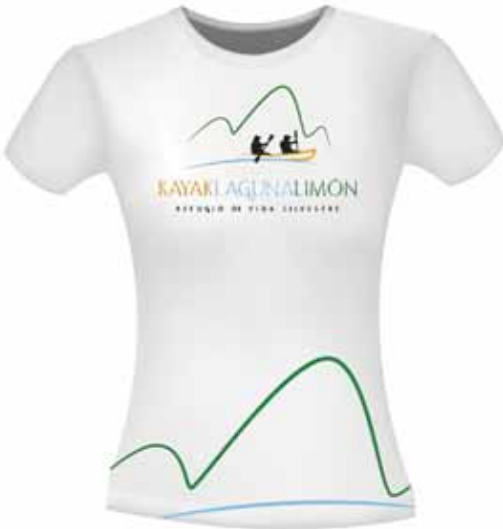
FEMALE T-SHIRT

SOUVENIRS

T-SHIRTS



MALE T-SHIRT



FEMALE T-SHIRT

