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RAPID ASSESSMENT OF ECOTOURISM POTENTIAL IN THE REFUGIO DE VIDA SILVESTRE MANGLAR LA GINA, MICHES, DOMINICAN REPUBLIC

March 2012
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, the Ornithological Society of Hispaniola (SOH), The Center for Environment, Economy, and Society at Columbia University

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TECHNICAL REPORT

RAPID ASSESSMENT OF ECOTOURISM POTENTIAL IN THE REFUGIO DE VIDA SILVESTRE MANGLAR LA GINA, MICHES, DOMINICAN REPUBLIC

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1.0 INTRODUCTION

A rapid assessment of the La Gina Mangrove Wildlife Refuge [Refugio de Vida Silvestre Manglar La Gina] (Map 1) was conducted by a team from the US Forest Service International Institute of Tropical Forestry and the Hispaniola Ornithological Society for USAID in support of ongoing research and tourism programs by Columbia University's Center for Environment, Economy, and Society. The assessment was limited to the La Gina Bay, to determine potential for ecotourism development in this area. Team leader was Jerry Bauer and team members included Jerry Wylie, Jorge Brocca, Bienva Bauer, and Liliana Peralta. The team was joined by Sandy Reyes, local coordinator for The Center for Enviromental Economy and Society at Columbia University and Jonathan Mercado, park guard from the refuge.

The La Gina refuge is located 11 km east of the small town of Miches in the Province of El Seibo, about a 3 ½ hour trip from Santo Domingo. The small village of Culebra is located along the highway about 1.5 km to the southwest of the refuge office.

An exploratory trip was made by Jorge Brocca by boat from Miches January 10, 2102. The area from Miches to El Capitan and the entire team spent about five hours exploring the refuge in two local fishing boats January 30, 2012. The second trip began and ended at the new refuge guard station and covered approximately 25 km (Map 2).

This rapid assessment was conducted over a short time-frame. A more comprehensive assessment could be conducted to better understand the current situation and potential future development.

2.0 DESCRIPTION OF REFUGIO DE VIDA SILVESTRE MANGLAR LA GINA

The Gina Mangrove Wildlife Refuge is located in the eastern part of the Dominican Republic at UTM NAD27: 483607 E. / 2102780 N, in the El Seibo province, near the small town of Miches (Map 1). The Refuge is 53 km2 in size, of which 37 km2 is coastal and 16 km2 is terrestrial. The predominant land cover of the refuge is mangrove forest, which also has large areas of coastal swamp, in a Subtropical humid forest life zone. The marine zone is dominated by coastal reef ecosystem. A more detailed description of the Refuge can be found in Mateo et al. (2010).

A brief description of the biodiversity in the Refuge follows:

- **Marine Biota** - The costal and marine ecosystem in the Samaná region contains 574 marine species (Herrera 2005) comprised of 72 species of algae (24 rhodophyta, 16 phaeophyta and 30 chlorophyta), 258 species of invertebrates belonging to about 22 high taxonomic groups, and 236 species of bony fish, sharks and rays (Table 1). The Refugio de Vida Silvestre Manglar de La Gina is within Samana region and most of these marine species can be found here, although we did not find any specific study of the marine biota the La Gina bay.

Table 1. Summary of taxonomic groups represented in Bahia La Gina.

Habitats: Mangroves-Estuaries-Seegrass-Reef-Ocean		
Engraulidae	Gerreidae	Mullidae
Stromateidae	Scianidae	Sparidae
Trichiuridae	Carangidae	Serranidae
Clupeide	Lutjanidae	Holocentridae
Penaidae	Haemulidae	Priacanthidae
Mugilidae	Sphyraenidae	Balistidae
Centropomidae	Scombridae	Palinuridae
Ephippidae	Polynemidae	Labridae
Gerreidae	Scaridae	

- **Birds** - A total of 85 species of birds have been reported for the Miches area in various studies, 61 of which have been reported from La Gina bay (this study, Annex A). Seven of the birds reported are endemic to the Hispaniola island (*Dulus dominicus, Phaenicophilus palmarum, Melanerpes striatus, Todus subulatus, Icterus dominicensis, Nesoctites micromegas* y *Coccyzus longirostris*). The ornithofauna is represented primarily by *Fregata magnificens, Ardea herodias, Egretta alba, Ceryle alcyon, Egretta caerulea, Tyranus dominicensis, Pelecanus occidentalis and Pandion haliaetus*. (Annex A). An important report is a colony of *Ardea herodias* in the Pajaros island, were 14 individuals were observed between the two continuing islands. This is the most important place for this species in La Gina bay.

Endangered bird species includes *Fregata magnificens, Aramus guarauna, Rallus longirostris, Sterna antillarum*. Except for the last species, whose conservation status is unknown, the others are included in the vulnerable category (SEA/DVS 1990/2011). The *Patagioenas leucocephala, Patagioenas inornata* are also present here, and is listed as vulnerable both nationally (SEA/DVS 1990/2011), and internationally (UICN 2004).

- **Amphibians and Reptiles** – For the La Gina and Miches area and its surroundings we have reported the presence of 6 species of amphibians and 9 species of reptiles, even though Blair Hedges 2011 reported 11 amphibians and 20 reptiles in the total in the area. Eight of the amphibian species and 16 of the reptile species are endemic (Annex B).

Among the reptile species seven are considered vulnerable. These are the green snakes (*Uromacer oxyrhunchus*), savanna snake (*Hypsirhynchus parvifrons*) and the jicotea turtle (*Trachemys stejnegeri*). These species are included in the category of vulnerable in regards to their conservation status in natural conditions (SEA/DVS 1990). According to reports you can find in the beaches presence of marine turtles like the leatherback (*Dermochelys coriacea*), the loggerhead (*Caretta caretta*), the 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 research we observed a group of 5 dolphins (*Delphinus delphis*) but not the manatee, even though we searched in the areas were the manatee have been reported.

- **Plants** – On the coast the sandy bottoms are covered in sea grass, including turtle grass (*Thalassia testudinum*). The mangroves occupy an area of 14.5 km2 and are dominated by red mangrove (*Rhizophora mangle*) and white mangrove (*Laguncularia racemosa*).

- **Geology** – Studies in the area show that this bay is of recent origin and was formed by deposits of lacustrine materials. It's located in a costal plain. Only in the southern sector there is chains of doline were the highest peaks are found, including: Loma la Culebra with 323 metros and Loma of the Veletas with 288 meters in altitude (Ferreras et al., 1990).

- **Water Resources** – In the Gina area there are numerous Rivers like: Catalina, Magua, Culebra, the Jayán, and the Mojica river. In addition we find the streams Cabezudos, Rico, Jina, Cabra creek and Ceiba creek.

- **Climate** – The climate is part of the Caribbean costal plain and the sector is relatively dry with annual rainfall averaging between 1,000 and 1,700 mm, the dry season is during the months of January to March. The average temperature is 26.5°C. The trade winds are predominantly East-southeast with an average speed of 12 km/h.

- **Cultural Resources** – After both literary and technical research we have not found evidence of aboriginal culture in the area of study.

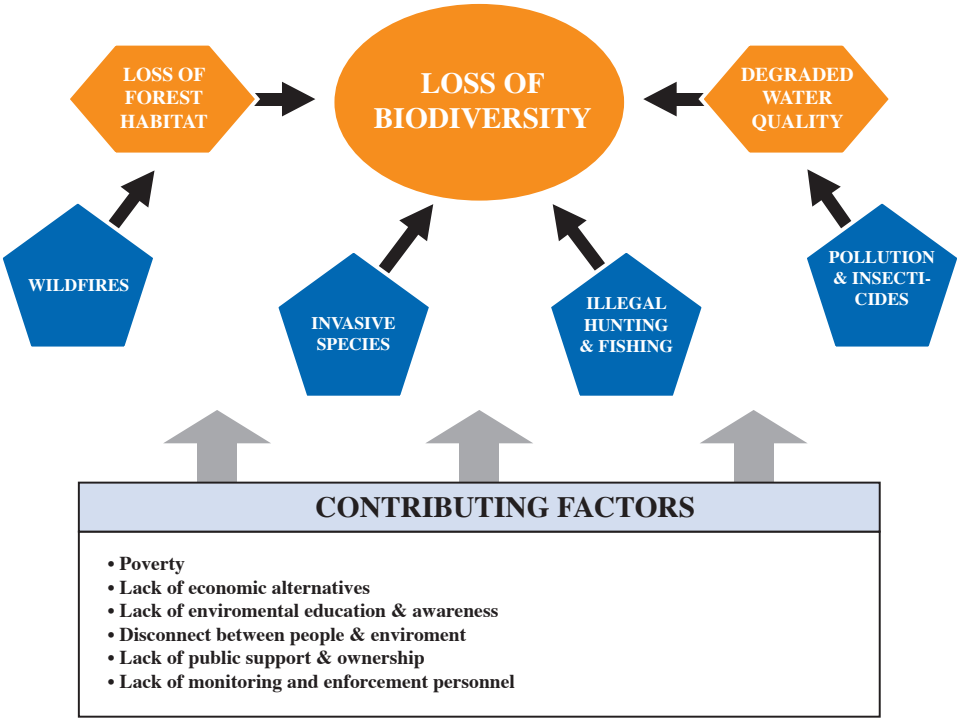
3.0 POTENTIAL BIODIVERSITY THREATS

At the present time, the Refuge does not have a management plan. Eleven biodiversity threats for the Refuge were identified in Domínguez, et al. (2008).

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. (Figure 1).

These threats could affect local communities on the Refuge boundary and the potential public use of the lagoon. These factors include poverty and the lack of economic alternatives for local fishermen, a general lack of environmental education and awareness, a lack of public support and ownership of the refuge, and a lack of monitoring and law enforcement.

Figure 1 – Direct and indirect threats and contributing factors to the Refugio de Vida Silvestre Manglar La Gina.



4.0 RAPID ASSESSMENTS

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

A rapid SWOT assessment at La Gina resulted in few strengths and opportunities, and many weaknesses and threats (Table 2).

Strengths include protected area status and healthy mangrove forest and abundant birdlife. All are positive elements for ecotourism development, but all are under threat if adequate protection is not ensured.

There are many challenges to development of a community-based ecotourism program in this site. These include difficult access, no infrastructure (such as boat dock and visitor facilities), and the fact that the local communities (La Gina, La Culebra, Magua, and Capitan) are not coastal and located a few kilometers (see Map 1). In a preliminary assessment on bird-related opportunities in the Miches Basin, Steingard et al. (2010) stated, "There will have to be an initial capital investment in the human and built infrastructure to support bird tourism including nature guide training, hospitality training, improvements to the hotels and other tourism related facilities. We do not think this is insurmountable problem, quite the contrary, but we do think it is important to develop a realistic, comprehensive strategic and financial plan for birding tourism if it is to be successful.

Other major weaknesses include no beaches or snorkeling sites. Diving is an option in the area, but we were informed that the reef is in very bad condition and not an attractive tourist site. Additionally, although the mangrove forest is interesting, it is mostly very closed and does not offer attractive or accessible sites for kayaking (see sea kayak tourism assessment below).

An assessment of the area's strengths, weaknesses, opportunities and threats is summarized in Table 1 below.

B. Checklist for Tourism Suitability, Readiness and Sustainability

As part of the assessment to evaluate the actual situation and to determine ecotourism potential in the La Gina Refuge, the team completed a checklist for "Tourism Suitability, Readiness and Sustainability". This checklist evaluates several criteria for tourism suitability and readiness at the community level (Annex A). A score of less than 44 points is considered marginal for tourism development. According to our team's assessment, La Gina scored very low, with 17-23 points, placing it well under the minimum "marginal" range for tourism success.

This low score does not mean that tourism cannot be successful at this site, but it does identify the challenges that must be faced if tourism activities are undertaken. Efforts to improve both suitability factors (attractions, natural & regulatory environment and community values) and readiness factors (planning & governance, access & infrastructure, customers & commerce, local capacity, information, and marketing & image) will be needed. We recommend the reader study Annex C in detail to see how our assessment team scored tourism suitability and readiness for this site. All areas that scored low, must be addressed before tourism is promoted for this site.

Table 2 - SWOT Rapid Assessment.

Strengths	**Weaknesses**
• Protected area status with guard station • Healthy mangrove forest • Diversity of birds • Traditional fishing with boats and nets • Dolphin (occasionally seen) • Manatee (rarely seen) • River access in Río Culebra	• Unpredictable weather, wind, and waves • Poor roads • Little or no tourism infrastructure • No guides • No signage • No environmental interpretation • No dock for launching boats • Limited communications • Long travel distances between attractions • Very few options for search and rescue • Poor water clarity for viewing fish • No sandy beaches or snorkeling • No information in guide/tourism books • Lack of emergency service • Local community located at a considerable distance from the refuge and the bay, making connectivity to marine environment more difficult • Local fishermen boats are unsafe for tourists
Opportunities	**Threats**
• Wildlife viewing & interpretation • Wildlife photography (low)	• Potential boating accidents • Deforestation • Illegal hunting & fishing (including manatee) • Future competition from Los Haitises National Park and and Samaná Bay

C. Sea Kayak Tourism Assessment

We evaluated the La Gina bay's potential for sea kayak tourism using the following numerical system that is 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, sometimes dolphins and occasionally manatee. Score = 2 points
B. Water Quality - poor (generally turbid). Score = 1 to 2
C. Scenic Quality - includes a view of distant foothills. Score = 2
D. Safety and Comfort - low. Score = 1
E. Cultural and Historic Attractions - limited to traditional fishermen. Score = 1
F. Natural Attractions - limited to the mangrove forest and Rio Culebra. Score = 1

G. Diversity of paddling opportunities - limited. Score = 1
H. Other recreational opportunities - none present. Score = 0
I. Conflicts with other users - is not a problem. No deduction
J. Accessibility to water - poor and limited. Minus 1
K. Trash - a problem along the shore. Minus 1
Total Score - is 8-9 points

In order to place sea kayak potential for La Gina bay in context, below is a list of other sea kayak sites in the region that our team has evaluated:

Sea Kayak Rating for 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 Bávaro, República Dominicana
- 18 points - La Caleta, República Dominicana
- 17 points - Laguna Limón, República Dominicana
- 14 points - Pearl Lagoon, Nicaragua
- 9 points - Utila Island, Honduras

Please note that this kayak assessment scoring system measures "kayak potential" for the site, not "kayak commercial 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 but this area still doesn't 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 commercial success" is related more to good management practices and solid implementation and not just "site potential".

5.0 CONCLUSIONS AND RECOMMENDATIONS

The refuge's primary attractions are its birds and the possibility of seeing dolphin and the more elusive manatees. The mangrove forest is healthy and can be accessed along the Rio Culebra. Traditional fishermen with their nets in La Gina Bay are also interesting.

However, these attractions are spread over a large area and seeing marine mammals cannot be guaranteed. For example, dolphin were observed on the first assessment field trip, but not on the second and Columbia University researchers (Gomez, Ross, Clary, 2009) reported that during a three-month wildlife survey in the bay they never observed a manatee. In addition, transportation is difficult and tourism infrastructure and support is non-existent or very limited. In other words, the weaknesses greatly outnumber the strengths.

Potential threats are typical, including environmental degradation through deforestation, hunting and fishing (including manatees), sedimentation and water pollution. Another challenge to the development of tourism in the future is competition from Los Haitises National Park, about 30 km to the east. When the road is improved, tourists from the Miches area would more likely go to Los Haitises National Park to view wildlife and other resources that are much more abundant and attractive.

Because of the size of the area, water conditions and uncertainty with local weather, powerboats are the best and safest way to visit the refuge. The kayak numerical ranking indicates the refuge has very low potential for the development of kayak tourism.

Based on our assessment, the refuge appears to have limited potential for nature-based tourism at this time. However, in the future it may be possible to develop wildlife-viewing tours if dolphin, and especially manatee, can be seen on a regular basis. More research is needed to determine the feasibility of such tours.

Also, we see a low-level of opportunity for nature photography tourism, mostly birds and mangrove ecosystems. Many other sites in the Dominican Republic offer equal or better opportunities for nature photography.

However, before tours could be started, the limitations identified in the SWOT and the Suitability, Readiness and Sustainability checklist must be addressed, especially the need for a safe dock at the refuge office for loading and unloading boats, as well as all of the readiness factors.

If ecotourism activities are to be initiated in the La Gina Refuge a lot of effort will be needed and it will take time. The local community is not ready for tourism and will need much mentoring, training and guidance to initiate any activities.

Also, for any ecotourism development in La Gina refuge, the entire Miches watershed, from Los Haitises on the east to Sabana de Nisibon on the west must be evaluated and considered as a whole. A Miches watershed comprehensive tourism strategic plan should be developed.

Finally, the Fundación Tropicalia (http://fundaciontropicalia.org, http://miches.wordpress.com) is developing a sustainable development model for the Miches area and making a major investment in tourism development. Ecotourism development in La Gina could be undertaken in coordination with this organization.


Columbia

PHOTOGRAPHS

Photo 1 – Ministry of Environment guard station at La Gina. This is the only infrastructure in the Refuge.

Photo 2 – The boat launch into the bay, no infrastructure exists at this location.

Photo 3 – An alternate route to launch from a private boat dock crossing through muddy swamp land.

Photo 4 – Local fisherman boat, it is small and not adequate for tourists.

Photo 5 – Assessment team in local fisherman boat caught in a sudden rainstorm. A situation like this could be very unsafe for tourists.

Photo 6 – Representative area of the mangrove forest. Notice how closed the forest is, with little or no access for small boats or kayaks.

Photo 7 – Representative area of the mangrove forest. Notice how closed the forest is, with little or no access for small boats or kayaks.

Photo 8 – Assessment team observing local fisherman casting his net.

Photo 9 – Wildlife photography is a tourism opportunity at La Gina.

Photo 10 – Dolphin in La Gina Bay, another opportunity for wildlife watching, but the dolphins are not frequently seen.

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MAPAS

Map 1 - Location map of Refugio de Vida Silvestre Manglar La Gina.

Map 2 - Routes explored during assessment visits.

ANNEX A

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

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).

	Cathartidae	*Cathartes aura*	Aura Tiñosa	•	∞	Δ	◊		**LC**	**AP-II**	**X**	**A**	**Cr**
	Pandionidae	*Pandion haliaetus*	Guincho	•	∞	Δ	◊		**LC**	**AP-II**	**X?**	**PC**	**C**
Falconiformes	**Accipitridae**	*Accipiter striatus*	Guaraguaito de Sierra			Δ			**LC**	**AP-II**	**X**	**E**	**C**
		Buteo jamaicensis	Guaraguao			Δ	◊		**LC**	**AP-II**	**X**	**E**	**C**
	Falconidae	*Falco sparverius*	Cuyaya	•	∞	Δ	◊		**LC**	**AP-II**	**X**	**A**	**C**
		Falco peregrinus	Halcón Peregrino	•					**LC**	**AP-II**	**XN**	**PC**	**C**
	Rallidae	*Porphyrio martinica*	Gallareta Azul	•	∞	Δ	◊		**LC**		**X**	**O**	**I,F**
Gruiformes		*Gallinula galeata*	Gallareta Pico Rojo	•	∞	Δ	◊		**LC**		**X**	**A**	**I,F**
		Fuica caribea	Gallareta Pico Blanco	•	∞				**LC**		**X**	**A**	**I,C**
		Fulica americana	Gallareta Pico Blanco	•					**LC**		**X**	**A**	**I,C**
	Aramidae	*Aramus guarauna*	Carrao	•	∞		◊	**NT**	**LC**		**X**	**E**	**I,C**
Galliformes	**Numididae**	*Numida meleagris*	Guinea				◊				**XI**	**E**	**I,F,G**
Charadriiformes	**Charadriidae**	*Charadrius vociferus*	Tiito	•	∞	Δ	◊		**LC**		**X**	**E**	**I**
	Recurvirostridae	*Himantopus mexicanus*	Viuda				◊		**LC**		**X**	**C**	**I**
	Jacanidae	*Jacana spinosa*	Gallito de Agua			Δ			**LC**		**X**	**C**	**I**
	Laridae	*Sternula antillarum*	Charrán Menor	•	∞				**LC**		**X**	**PC**	**C**
		Thalasseus sandvicensis	Charrán Piconegro		∞				**LC**		**X**	**E**	**C**
		Hydroprogne caspia	Charrán Piquiroja			Δ			**LC**		**X**	**E**	**C**
		Thalasseus maximus	Charrán Real	•		Δ			**LC**		**X**	**E**	**C**
	Scolopacidae	*Tringa flavipes*	Patas Amarillas Menor	•			◊		**LC**		**XN**	**E**	**I**
		Actitis macularia	Playerito Manchado		∞		◊		**LC**		**XN**	**E**	**I**
		Arenaria interpres	Playero Turco	•	∞				**LC**		**XN**	**E**	**I**
		Calidris alba	Playerito Blanquito	•		Δ	◊		**LC**		**XN**	**E**	**I**
Columbiformes	**Columbidae**	*Patagioenas squamosa*	Paloma Turca			Δ		**NT**	**LC**		**X**	**E**	**G**
		Patagioenas inornata	Paloma Ceniza				◊	**VU**	**VU**		**X**	**E**	**G**
		Patagioenas leucocephala	Paloma Coronita	•	∞			**V**	**VU**		**X**	**C**	**G**
		Zenaida asiatica	Rolón Aliblanca	•	∞		◊		**LC**		**X**	**A**	**G**
		Zenaida aurita	Rolón Turco	•	∞		◊		**LC**		**X**	**PC**	**G**
		Zenaida macroura	Rabiche	•	∞	Δ	◊		**LC**		**X**	**C**	**G**
		Columbina passerina	Rolita	•	∞	Δ	◊		**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**	*Coccyzus americanus*	Pájaro Bobo Pico Amarillo		∞	Δ	◊		LC		X	O	C,I
		Coccyzus minor	Pájaro Bobo Menor	•		Δ	◊		LC		X	C	C,I
		Coccyzus longirostris	Pájaro Bobo	•	∞	Δ	◊		LC		XR	A	C,I
		Crotophaga ani	Judío	•	∞	Δ	◊		LC		X	A	C,I
Strigiformes	**Tytonidae**	*Tyto glaucops*	Lechuza Cara Ceniza				◊		LC	AP-II	XR	C	C
		Tyto alba	Lechuza Cara Blanca			Δ	◊		LC	AP-II	X	E	C
Caprimulgiformes	**Caprimulgidae**	*Chordeiles gundlachii*	Querebebe				◊		LC		X	E	I
Apodiformes	**Apodidae**	*Tachornis phoenicobia*	Vencejito Palmar	•	∞		◊		LC		X	C	I
	Trochilidae	*Anthracothorax dominicus*	Zumbador Grande	•	∞	Δ	◊		LC	AP-II	X	C	I,N
		Mellisuga minima	Zumbadorcito	•	∞	Δ	◊		LC	AP-II	X	A	I,N
Coraciiformes	**Todidae**	*Todus subulatus*	Barrancolí	•	∞	Δ	◊		LC		XR	E	I
	Alcedinidae	*Ceryle alcyon*	Martín Pescador	•	∞		◊		LC		XN	E	C
Piciformes	**Picidae**	*Nesoctites micromegas*	Carpintero de sierra		∞	Δ		NT	LC		XR	C	I,F
		Melanerpes striatus	Carpintero	•	∞	Δ	◊		LC		XR	A	G,F,I
Passeriformes	**Tyrannidae**	*Contopus hispaniolensis*	Maroita				◊		LC			O	I,F
		Tyrannus dominicensis	Petigre	•	∞	Δ			LC		X	A	I
		Myiarchus stolidus	Manuelito				◊		LC				I,F
	Vireonidae	*Vireo altiloquus*	Julián Chiví	•	∞	Δ	◊		LC		X	C	I,F
	Corvidae	*Corvus leucognaphalus*	Cuervo			Δ		EN	VU		XR	E	O
	Hirundinidae	*Petrochelidon fulva*	Golondrina de Cuevas	•		Δ			LC		X	C	I
		Hirundo rustica	Golondrina Cola de Tijera		∞		◊		LC		XN	E	I
	Turdidae	*Turdus plumbeus*	Chua-chuá	•	∞	Δ	◊		LC		X	O	O
	Mimidae	*Mimus polyglottos*	Ruiseñor	•	∞	Δ	◊		LC		X	C	O
	Dulidae	*Dulus dominicus*	Cigua Palmera	•	∞	Δ	◊		LC		XR	A	F
	Parulidae	*Setophaga americana*	Cigüita Setophaga	•	∞	Δ	◊		LC		XN	O	I
		Setophaga tigrina	Cigüita Tigrina	•	∞		◊		LC		XN	E	I
		Setophaga caerulescens	Cigüita Azul	•	∞		◊		LC		XN	A	I
		Setophaga discolor	Cigüita de los Prados	•	∞		◊		LC		XN	O	I
		Setophaga palmarum	Cigüita Palmar	•	∞		◊		LC		XN	PC	I
		Mniotilta varia	Pegapalo		∞	Δ	◊		LC		XN	O	I
		Setophaga ruticilla	Bijirita	•	∞		◊		LC		XN	A	I
		Seiurus aurocapilla	Cigüita Saltarina	•	∞		◊		LC		XN	A	I
		Parkesia motacilla	Cigüita del Río	•	∞	Δ	◊		LC		XN	C	I
		Geothlypis trichas	Cigüita Enmascarada	•	∞	Δ			LC		XN	O	I
	Coerebidae	*Coereba flaveola*	Cigüita Común	•	∞	Δ	◊		LC		X	A	N,I
	Thraupidae	*Phaenicophilus palmarum*	Cuatro Ojos	•	∞	Δ	◊		LC		XR	A	G,F,I
	Emberizidae	*Tiaris bicolor*	Juana Maruca			Δ			LC		X	PC	G
		Tiaris olivaceus	Cigüita de Hierba	•	∞		◊		LC		X	E	G
		Loxigilla violacea	Gallito Prieto		∞	Δ	◊		LC		X	E	F
	Icteridae	*Quiscalus niger*	Chinchilín	•	∞	Δ	◊		LC		X	A	O
		Icterus dominicensis	Cigua Canaria	•	∞	Δ	◊	VU	LC		XR	A	G,F,I
	Ploceidae	*Ploceus cucullatus*	Madam Sagá	•	∞		◊				XI	E	G

*Estudio

- • 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
- Δ Steingard & Winchell 2010
- ◊ Brocca & Almonte 2009
- Stotz (BDATA) República Dominicana

ANEXO A. Lista de Aves Observadas en Laguna Bávaro / Taxonomía Basada en La American Ornithological Union, 2005 (Compilado por Jorge Brocca, Mayo 2011).

Key to Codes in Table

1. Especies amenazadas

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

- Extinto (EX): Cuando no ha 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 descripta 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 I: Insectívora ; N: Nectívoro ; O: Ovívoro

ANNEX B

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

					Estudio		Categoria de Amenaza		
Familia	Especie	Nombre Común	Estatus	Ocurrencia	BH*	JB*	UICN	SEA/DVS	CITES
Anfibios									
Bugonidae	Rhinella marina	Maco Pempen	Introducida	Común	•	X			
Ranidae	Rana catesbeiana	Maco Toro	Introducida	Común	•	X			
Hylidae	Hypsiboas heilprini	Rana Arboricola Verde	Endémica	Rara	•		Vulnerable	Vulnerable	
	Osteopilus pulchrilineatus	Rana Arboricola Amarilla	Endémica	Rara	•		En Peligro	En Peligro	
	Osteopilus vastus	Rana Arboricola Gigante	Endémica	Rara	•		En Peligro	En Peligro	
	Osteopilus dominicensis	Rana Arboricola	Endémica	Común	•				
Leptodactylidae	Eleutherodactylus abbotti	Calcalí	Endémica	Común	•	X			
	Eleutherodactylus flavescens	Calcalí	Endémica	Común	•	X	Casi Amenazado	Casi Amenazado	
	Eleutherodactylus inoptatus	Calcalí	Endémica	Rara	•	X			
	Eleutherodactylus ruthae	Calcalí	Endémica		•	X	En Peligro	En Peligro	
	Eleutherodactylus weinlandi	Calcalí	Endémica	Rara	•				
Reptiles									
Teiidae	Ameiva chrysolema	Lagartija	Endémica	Rara	•				
	Ameiva taeniura	Lagartija	Endémica	Rara	•				
Anguidae	Celestus costatus	Lucio	Endémica	Rara	•				
	Celestus stenurus	Lucio	Endémica	Rara	•				
Sphaerodactylidae	Sphaerodactylus darlingtoni	Salamanquejita	Endémica	Rara	•				
	Sphaerodactylus difficilis	Salamanquejita	Endémica	Común	•	X			
	Hemidactylus haitianus	Geco	introducida	Común	•	X			
Iguanidae	Anolis chlorocyanus	Lagartija	Endémica	Común	•				
	Anolis cybotes	Lagartija	Endémica	Común	•	X			
	Anolis semilineatus	Lagartija	Endémica	Rara	•	X			
	Anolis olssoni	Lagartija	Endémica	Rara	•	X			
	Anolis distichus	Lagartija	Nativa	Común	•	X			
	Leiocephalus lunatus	Mariguanita	Endémica	Rara	•				
	Leiocephalus personatus	Mariguanita	Endémica	Rara	•	X			
Boidae	Epicrates striatus	Boa de la Hispaniola	Nativa	Rara	•	X		Casi Amenazado	AP-II
Dipsadidae	Hypsirhynchus parvifrons	Culebra Sabanera	Endémica	Común	•	X			
	Uromacer oxyrhynchus	Culebra Verde	Endémica	Común	•	X		Casi Amenazado	
Tropidophidae	Tropidophis haetianus	Falsa Boa	Nativa	Rara	•				AP-II
Typhlopidae	Typhlops pusilla	Víbora	Endémica	Rara	•				
Chelonidae	Caretta caretta	Caguamo	Nativa	Rara	•		Vulnerable	Vulnerable	AP-I
	Chelonia mydas	Tortuga Verde	Nativa	Común	•	X	Vulnerable	En peligro	AP-I
	Eretmochelys imbricata	Carey	Nativa	Rara	•		Criticamente en Peligro	Criticamente en Peligro	AP-I
Dermochelyidae	Dermochelys coriacea	Tinglar	Nativa	Rara	•		Criticamente en Peligro	En peligro	AP-I
Emydidae	Trachemys stejnegeri	Tortuga terrestre	Endémica	Común	•	X		Vulnerable	

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

ANNEX C

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

Minimum Suitability Score = 24 Points [(A+B+C) x 3]
Minimum Readiness Score = 17 Points [D thru I]

Total Score Values

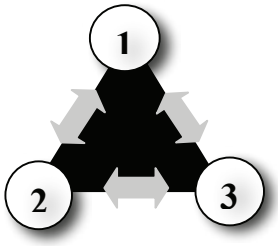
Marginal	< 44 points
Good-Very Good	45-60 points
Excellent	> 61 points
Maximum	75 points

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)

SUITABILITY FACTORS…Can you have tourism?	Score
A. **Attractions** - Is there sufficient "pay-off" for visitors' investment of time, effort and money? Attractive scenery? Unique and authentic nature & culture?	1-2
B. **Natural & Regulatory Environment –** There are no serious limitations to tourism due to environmental conditions or government regulations.	2
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?	2-3
Sub Total	5 - 7
Suitability Score - Multiply sub total by 3. A minimum acceptable score is 24 points A minimum acceptable score is 24 points	**15 - 21**

READINESS FACTORS…Are you ready for tourism?	
A. **Planning & Governance –** Is there good planning, organization, and leadership?	0 - 1
B. **Access & Infrastructures –** Is there good access and tourism infrastructure?	0
C. **Customers & Commerce –** Do you have customers and business opportunities?	1
D. **Local Capacity –** Is there professional expertise?	0
E. **Information –** Is there good visitor information and interpretation?	0
F. **Marketing & Image –** Do prospective customers know you?	0
Readiness Score – A minimum acceptable score is 17 points	**2**

Total Suitability + Readiness – Less than 44 points is "marginal", 45-60 points is "good to very good", & 61 points or greater is "excellent"	**17 - 23**

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.