APPLICATION FORM

1. MODALITY

AICOM (Area of Importance for Bat Conservation)

2. PROPOSED NAME

Complete name: North karst formations and Washington-Slagbaai National Park
Abbreviated name: North karst and WSNP

3. APPLICANT'S INFORMATION

Name of PCM responsible: PPRABC
Country: Islands of Aruba, Bonaire and Curaçao
Name and email of coordinator: Fernando Simal e-mail: fernando.simal@wildconscience.com
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Date of application: December 8th, 2011

4. JUSTIFICATION

Mark appropriate requirements:

- [x] **Criterion 1.** The area/site contains species of conservation interest at national or regional level (includes threatened and nearly threatened species in red lists of countries, species in IUCN Red List, endemics, migratory, rare, Data Deficient, important role in ecosystem functioning, species with small or restricted distributional ranges, or species present in their limit of distribution).
- [x] **Criterion 2.** The area/site contains roosts with one or several species of conservation interest and used temporarily or permanently, or during a significant part of their life cycle, as in the case or maternity roosts or sites of aggregation for migration (includes a system of caves, specific roosts such as buildings, roofs, among others).
- [ ] **Criterion 3.** The area/site contains high species richness, independently of threat level.

Mark threats that apply:

- [x] **Threat 1.** Habitat loss.
- [x] **Threat 2.** Roost destruction and disturbance.
- [ ] **Threat 3.** Human-bat conflicts and emergent diseases.
- [ ] **Threat 4.** Indiscriminate use of toxic substances.
- [ ] **Threat 5.** Emergent threats (wind farms, invasive species, white-nose syndrome).

Justification summary:

The Island of Bonaire has a system of natural caves that probably exceeds 150 in number. They house at least five species of bats: *Leptonycteris curasoae*, *Mormoops megalophylla*, *Natalus tumidirostris, Myotis nesopolus* and *Glossophaga longirostris*. The former four depend primarily or exclusively on caves as diurnal and maternity roosts. The IUCN Red List of Threatened Species considers *L. curasoae* as Vulnerable. Several studies have underlined the importance of this bat as pollinator and long-distance seed dispersal agent of several species of succulent plants in northern South America. Likewise, indirect evidence suggest that between December and March part of the populations of Aruba, Curaçao and Bonaire abandon these islands and move to the arid and semiarid zones of Venezuela and Colombia. Until now, we did not know that *L. curasoae* reproduced on Bonaire, but during the last three years, studies conducted in the island have shown that it is important as mating and maternity site for the species. At present, we have identified four caves used as maternity roosts. *Mormoops megalophylla* also reproduces on Bonaire, with at least two maternity caves. Recognition of the Washington–Slagbaai National Park and surrounding areas as an AICOM will contribute to protect the main habitat types used by all species present on the island as food sources and roosts.

5. MAIN SPECIES TO PROTECT

(Photo: Jesús Molinari)

***Leptonycteris curasoae* Miller, 1900**
Curaçaoan Long-nosed Bat
(Phyllostomidae, Glossophaginae)

Distribution:

Distributed in arid and semiarid zones and dry forests in Colombia, Venezuela and the Caribbean Netherlands.

Conservation status
Venezuela status: "Vulnerable A2c" (Nassar, 2008).
Global status: "Vulnerable A2c" (Soriano and Molinari, 2008).
Curaçao status: "Endangered" (Petit et al., 2006)
Aruba status: "Critically Endangered" (Bekker, 1999)

Bonaire status: Not defined

Comments

Leptonycteris curasoae is a mid-size bat, elongated rostrum, small ears, short leaf-nose, and short light-brown fur. Feeding habits include nectar, pollen and fruit from different plant families associated with dry ecosystems (Cactaceae, Agavaceae, Bombacaceae, Moraceae, Sterculiaceae). From these plants, cacti and agaves are their main food sources (Martino *et al*., 2002; Nassar *et al*., 1997; Petit 1995, 1997). It is a gregarious species, which congregates in colonies from a few thousands to tens of thousands individuals (Cole and Wilson, 2006). Diurnal roosts are hot caves, with some ventilation and indirect sunlight. This species flies long distances above the sea, among the ABC Islands and mainland (Venezuela), and different sources of evidence also suggest that it migrates seasonally to mainland (Simal et al., 2015; Fleming and Nassar, 2002; Newton *et al*., 2003; Sánchez and Cadena, 1999).

The ecosystems used by this species in northern South America and the Caribbean islands are among the most threatened in the region, with high conservation priority. Specific threats to *L. curasoae* include: 1) presence in one of the most threatened habitats in the region, 2) gregarious habits, which make them easily detectable and susceptible of being destroyed or disturbed, 3) dependence on food plants not legally protected and susceptible of massive removal for urban developments and agriculture, and 4) reproduction dependent on maternity caves, where newborns are very vulnerable to any cave disturbance. On Aruba Island, observations by J.M. Nassar indicate that the colonies of this species, historically, have been exposed to intense anthropogenic pressure. One of the main natural roosts used by the species, Tunnel of Love, was managed for several years as a recreational site. This activity restricted the colony of *L. curasoae* to a small chamber close to one of the entrances, and exposed it to stress with every visit of tourists. The other colony of this species, known for several years in Aruba Island, is located in an abandoned mine (Wela Mine), quite vulnerable to vandalism. On the Island of Bonaire, several caves are used by this species as diurnal and maternity roosts: Orizjan, Cueva Raton, Pos di Watapana and Spelonk. Together, they provide roost to several thousand bats. Specific measures to protect the colonies in these caves are in progress.

(Photo: Jafet M. Nassar)

***Mormoops megalophylla* Peters, 1864**
Ghost-faced bat (Mormoopidae)

Distribution

Its distribution ranges from Mexico to El Salvador, Colombia, Venezuela, Ecuador, Peru, Caribbean Netherlands and Trinidad.

Conservation status

***Global status*:** Least Concern

Bonaire status: Not defined

Comments

Mormoops megalophylla (Mormoopidae) is a medium-size mormoopid bat, with rounded rostrum, well-modified ears, like radar antennae. Dorsal fur has long and lax hair that changes color with the age (grey when young and sub-adults and brown-orange when adult). Its feeding habits include medium and large size nocturnal moths. It is of gregarious habits, congregating in colonies of hundreds and thousands. It prefers hot caves, using the darkest chambers. This species can be found in a wide spectrum of habitats, from arid and semiarid lands to wet tropical forests.

The main threat to this species at global and local level is cave destruction and disturbance, because it is very sensitive to noise and human activity inside the caves. On Aruba Island, for example, we have observed newborns abandoned on the ground in areas where tourists have free access. In caves in the Paraguaná Peninsula, Falcón, Venezuela, we have observed dying and dead individuals of *M. megalophylla* on the ground of caves (JM Nassar, pers. obs.), suggesting poisoning with toxic chemicals (e. g., pesticides).

6. LIST OF SPECIES PRESENT IN THE AREA

FAMILY PHYLLOSTOMIDAE
  SUBFAMILY Glossophaginae
Glossophaga longirostris
Leptonycteris curasoae
FAMILY VESPERTINILIONIDAE
Myotis nesopolus
FAMILY MORMOOPIDAE
Mormoops megalophylla
FAMILY NATALIDAE
Natalus tumidirostris

7. AREA LOCATION

Shaded in green, area covering the proposed Washington-Slagbaai AICOM, which includes Washington-Slagbaai National Park to the north, an area rich in caves to the center of the polygon and an are rich in karst substrate to the east.

The polygon that contains the proposed AICOM is composed of three parts:

1) The portion located to the northwestern part of the island comprises the Washington-Slagbaai National Park, already under protection. This area is very important as source of food for the bats, because it contains different habitat types, including columnar cactus forest, thorny forest, freshwater ponds, and hypersaline lagoons.
2) The central area of the polygon is the zone with the highest abundance of dolines, caves and sinkholes on the island. Several maternity roosts used by *L. curasoae, G. longirostris* and *M. megalophylla* are located there. Besides this, the area is important as food source for bats, because the main vegetation type present is the thorny forest. In 2010, this area was designated Zone for Nature Conservation by the Insular Government in the Zoning Plan for Bonaire, and therefore, it is under legal protection.
3) The eastern portion of the polygon is also part of the karstic formation of the island and in it we can find many natural roosts used by bats. At least one of the caves located there is used by *L. curasoae*

as maternity roost of importance during the lactating season of this species. The dominant habitat in this area is the columnar cactus forest. Despite of its ecological importance for bird populations on the island IBA (Important Bird Area) by Birdlife International, this zone was designated by the Insular Government as "Open Area" in the Zoning Plan of Bonaire, and therefore, it does not have legal environmental protection at present.

The geographic coordinates of the polygon at its margins are:

North: 12°18'43.97" N 68°23'15.19" W
South: 12°11'11.98" N 68°17'47.94" W
East: 12°12'11.02" N 68°12'20.64" W
West: 12°15'28.87" N 68°25'16.08" W

8. GENERAL DESCRIPTION OF THE AREA

Geomorphology

North and central parts of the island are the product of submarine volcanic activity during the Cretaceous Period. The highest elevation of the island is 241 m, with and estimated age between 90 and 100 million years. This mountain landscape is surrounded by karstic terraces as result of changes in the sea level suring the last 5 million years. Depending on the location in the island, 3 to 5 different terraces can be observed. The highest one has 50 m elevation and its age is estimated in 1 million years (Boeskschoten, 1982). It is in this karst formation where caves are found, mainly in the zones known as Bolivia and Barkadera.

Weather

The Island of Bonaire has semiarid weather. It is connected to a marine area with lower temperaturas at the surface caused by the Trade Winds along the Venezuela's coast (Lahey, 1958).

Flora

The flora of Bonaire is composed of approximately 340 species (Stoffers, 1982). Eventhough there are vegetation zones well differentiated on the island due to soil heterogenity and relative position with respect to the windward coast, most of zones still without urban development are covered by lowlands thorny forest. Another very characteristic vegetation type corresponds to the saline shores and several marine areas, where only vegetation well adapted to the local conditions, as for example mangroves, can survive. Many plant species on the island concentrate their reproductive period during the three months of duration of the rainy season, while other species, many of them present xerophitic adaptations and can reproduce during the dry season (e.g., many cacti).

The majority of native species are threatened by exotic species of herbivores like donkeys, goats and feral pigs, dispersed across the entire island. The presence of this species, together with historical logging and agricultural activity, has produced secondary vegetation at many sites.

Fauna terrestre

Bonaire's fauna is poor in native mammals. Only eight species of bats are present: *Leptonycteris curasoae, Glossophaga longirostris, Mormoops megalophylla, Myotis nesopolus, Natalus tumidirostris, Pteronotus davyi, Molossus molossus* and *Ametrida centurio* (uncertain record). Birds are much more richer is species,

with 215 species recorded, including resident and migratory species. Among them, the iconic Caribbean flamingos highlight, with an estimated population around 7000 individuals, and Bonaire being the most important nesting site in South Caribbean. Seven species of reptiles have been reported for the island, two of them endemic. There are three species of amphibians, all exotic. Regarding the invertebrate fauna, scarce published information is available.

9. INVOLVED ACTORS

STINAPA Bonaire

It is the NGO responsible of the management of national parks on Bonaire. Its role will be the creation and execution of a management plan for the proposed AICOM.

Caribbean Office of the Ministry of Economy Affairs, Agriculture and Innovation (RCN)

Since October 10th, 2010, the Island of Bonaire is a municipality of Holland. This entity represents the Dutch Government in the island. Its environmental powers and attributes include the signature of international treaties such as Ramsar, SPAW and CITES; however, it does not participate in the management of natural resources at local level. This office of the ministry administrates financial resources that in the future could be used to manage and protect this AICOM.

Planning and Development Office of the public entity Bonaire (DRO and OLB).

The island government is responsible for the creation and implementation of the Nature Policy Plan, besides counseling the Insular Government on permits' approval of development plans and scientific research projects. It plays an important role regulating tourists' activities and research. This organization is key in the legal and physical protection of caves inside the AICOM.

Dutch Caribbean Nature Alliance (DCNA)

It is a regional network formed by all the foundations involved in management of natural areas in the Dutch Caribbean. DCNA was established in 2005 with the mission of bringing financial support and assistance to organizations responsible for the management of protected areas in the Dutch Caribbean. Its mission is to collaborate with the local organizations to preserve biodiversity in the Dutch Caribbean and promote sustainable use of those areas. They also manage a fund trust aimed to cover the operational expenses of national parks in each island.

Aruba, Curaçao and Bonaire Bat Conservation Program (PPRABC)

The Aruba, Curaçao and Bonaire Bat Conservation Program is member of RELCOM since 2011. Like all RELCOM members, PPRABC works for the wellness of bats of the three islands, conducting activities of research, education and conservation.

ALIANSA di Naturalesa.

It is an NGO that congregates all the small environmental organizations of the island with the main goal of make civil pressure against governmental decisions against the environment. It is a reactive organization that would contribute to protect the caves and bat fauna of the island in case of official measures that could put in risk the integrity of the caves and their bats.

10. PLANNED ACTIONS FOR CONSERVATION, EDUCATION AND RESEARCH

Conservation

To include caves important as bat roosts in the Nature Zone designed as part of the Zoning Plan of Bonaire that will take place in 2015. To create the Caves & Karst Nature Reserve of Bonaire. To generate the normative to regulate access and use of the main caves inhabited by bats on the island. Identify all the important caves for the bat fauna on Bonaire trough out systematic cave survey and to elaborate the cadastral records. To develop a management plan for the Caves & Karst Nature Reserve of Bonaire. To implement the protection of key caves (maternity, mating, roosts for rare species on the island, etc.) closing them to the people following appropriate protocols to avoid harming bats. To improve the habitat of nectar-feeding species, restoring disturbed areas and promoting plantation of chiropterophilous agaves (*Agave cocui*).

Communication and education

Using the Environmental Education Unit of STINAPA Bonaire, to develop and execute education programs involving local people and schools. Communicate the importance of bats and caves to the Bonerian community using the local media (radio, TV and press). To improve the course for certification of cave tour guides expanding list contents and information on the bat fauna.

Research and monitoring

Capacity building to prepare local volunteers in cave bat monitoring. Continue exploring caves across the island for their inclusion in the speleological cadaster and Caves & Karst Nature Reserve. Baseline study of bats in the different habitats of the island using combined techniques (mist netting and ultrasound detection). Continue the mark-and-recapture project of *L. curasoae* on the ABC islands and Venezuela to examine their migratory capacity and their population ecology. To study habitat use and movement patterns of *L. curasoae* on the island.

11. CITED LITERATURE

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12. ANNEXED MATERIAL (SITE PHOTOS)

Photo 1. Aspect of the Dry forest at the volcanic formations inside Washington-Slagbaai National Park.

Photo 2. Cacti-dominated forest (Cardonal) inside Washington-Slagbaai National Park.

Photo 3. Aspect of the Dry forest on the Quaternary Limestone terraces of northern Bonaire.

Photo 4. Bat research at Kueba Orizjan, one of the most important bat maternities within the proposed AICOM.

SUMMARY DATA

1.- Complete name of proposed site: Washington - Slagbaai

2.- Abbreviated name of proposed site: Washington - Slagbaai

3.- Location: Bonaire, Dutch Netherlands

4.- Main conservation value: Largest extensions of natural habitats used by all species of bats on Bonaire and where the great majority of diurnal roosts are located (included caves and karst system).

5.- Geographic coordinates:

North: 12°18’43.97” N 68°23’15.19” W
South: 12°11’11.98” N 68°17’47.94” W
East: 12°12’11.02” N 68°12’20.64” W
West: 12°15’28.87” N 68°25’16.08” W

6.- Area surface (in hectares): XXX ha

7.- Dominant vegetation type: Thorny forest, spiny scrubs, columnar cactus forest, Xeric Region South Caribbean

8.- List the five most important bat species in the site/area proposed (alphabetic order):
- *Glossophaga longirostris*
- *Leptonycteris curasoae*
- *Mormoops megalophylla*
- *Myotis nesopolus*
- *Natalus tumidirostris*

ESPACIO RESERVADO PARA RELCOM

AICOM Washington-Slagbaai

CÓDIGO: A-ABC-002

Date of approval: December 8th, 2012

Presented by: PPRABC (Programa pa Protehé raton dj' anochi).

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