CURAÇAO LAND AREA 444 km² ALTITUDE 0–375 m HUMAN POPULATION 138,000 CAPITAL Willemstad IMPORTANT BIRD AREAS 5, totalling 163 km² IMPORTANT BIRD AREA PROTECTION 86%

BIRD SPECIES **215**THREATENED BIRDS **1** RESTRICTED-RANGE BIRDS **1** BIOME-RESTRICTED BIRDS **1**

Adolphe Debrot (CARMABI Foundation) and Jeff Wells (Boreal Songbird Initiative)



Mount Christoffel, the highest point in Curação. (PHOTO: JEFF WELLS)

INTRODUCTION

Curação, which is politically part of the Kingdom of the Netherlands¹, is one of the three Netherlands Antillean islands (Aruba, Bonaire and Curação) that lie off the north-west coast of Venezuela. Curação is the middle one of the three islands (c.80 km east of Aruba, and 50 km west of Bonaire), and lies c.70 km off the coast of mainland Venezuela. It is the largest of the three "Leeward" Netherlands Antillean islands and c.56 km long by 4-10 km wide. The island consists of a basaltic centre of volcanic origin, rimmed in the coastal zones by marine limestone terraces. The landscape is rugged and rocky with prominent cliffs. Christoffelberg, at the north-west end of the island, is the highest point in Curação. The island has a dry, windy climate with an annual average rainfall of c.550 mm. The resultant vegetation comprises xeric shrubland characterised by columnar cacti. Curação possesses several semi-enclosed inland bays, which are densely fringed by

mangroves. There are also several enclosed shallow, hypersaline lagoons that are important for waterbirds, as are the numerous man-made freshwater catchment dams, some of which retain significant amounts of fresh water well into the dry season. The island is surrounded by coral reefs and a variety of rocky, sandy or rubble shores.

Curaçao has the largest human population of the Leeward Netherlands Antilles, and about 30% of the island has been occupied by housing and industry. In bygone eras, the vegetation of the island was heavily impacted by agricultural activities such as the cultivation of seasonal crops, charcoal production and livestock grazing. However, traditional agricultural activities have all but ceased due to economic factors, rampant theft of livestock and produce, and an increase in speculative private land ownership. As a consequence, dense secondary woodlands are gradually recuperating from the impacts of man and beast, and are not uncommon, especially on the western half of the island.

Conservation

In Curação about 30% of the island surface area has been legally designated as conservation habitat since 1997 by means of a land-use ordinance, the Curação Island Development Plan. Environmental policy and implementation is overseen

¹ At some point in the near future the "Netherlands Antilles" will be dissolved. St Maarten and Curaçao will become separate countries within the Kingdom of the Netherlands (similar to the status currently enjoyed by Aruba). The islands of Bonaire, Saba and St Eustatius will be linked directly to the Netherlands as overseas territories.

by the Department of Environment and Nature (Ministry of Public Health and Social Development), the Curação Urban Planning and Public Housing Service, the Curação Environmental Service, and the Curação Agricultural and Fishery Service. However, the CARMABI Foundation is the island's park service and formally manages nine conservation areas distributed around the island amounting to c.3,000 ha of terrestrial and lagoonal habitat (primarily within Northeast Curação parks and coastal IBA, AN015) and 600 ha of coral reefs (in the Curação Underwater Park on the leeward side of the island). The 2001 draft nature management plan for Curação identifies the need to update and expand all island level protective legislation. However, the plan still awaits ratification by the island council. Government funding for environmental protection and management remains sparse and often non-structural in spite of the recognised importance of the environment to sustainable tourism. In 2006, funding to the island park service (CARMABI Foundation) was cut by 70%. Limited institutional capacity due to insufficient funding has been identified as a key bottleneck to environmental management and conservation in the Netherlands Antilles.

Since 1988 when Defensa Ambiental (Environmental Defense) was founded, the local environmental NGO movement has grown significantly. A number of organisations are currently active, including Amigu di Tera (Friends of the Earth), Reef Care and Kids for Corals (with a focus on coral reefs), Uniek Curaçao (focusing on awareness and guided tours), Korsou Limpi i Bunita (clean ups), and the Stichting Dierenbescherming (animal cruelty and welfare). All of these organisations contribute to general environmental awareness, but none have a significant focus on the island's avifauna. The CARMABI Foundation is the only organisation that has conducted or supported (albeit intermittent) studies on priority birds, and organised birding excursions and workshops.

At present, urbanisation through real estate and tourist development, coastal development and disturbance (especially due to tourist-oriented recreational activity) are the principal threats to remaining habitat areas on Curaçao. These factors pose a major threat to the future integrity of the legally designated conservation areas, and the resultant habitat fragmentation (and disturbance) threatens a number of sensitive species such as nesting terns (*Sterna* spp.), Scalynaped Pigeon *Patagioenas squamosa*, Curaçao Barn Owl *Tyto alba bargei* and White-tailed Hawk *Buteo albicaudatus*. An

antiquated ordinance dating from 1926 provides limited legal protection to some native bird species (including some terns), but enforcement remains totally lacking.

Birds

Of the 215 species of bird that have been recorded from Curaçao only 57 are resident (current or former) breeding species, the vast majority being migrants, winterers, and occasional vagrants. Most of the migrants are Neotropical migrants (especially warblers) from breeding grounds in North America, although many are vagrants (recorded on average less than once a year). Little is known about the significance of the island habitats to these migrant birds. The rainy season usually begins (September–October) just in time to yield peak insect swarms for migrants such as swallows and warblers. A small number of Curaçao's species are of South American origin, representing either dispersing individuals or austral migrants overshooting their northern South American wintering grounds having originated from breeding grounds further south or west.

As with Aruba and Bonaire, due to the proximity of the islands to the mainland of South America and the general mobility of birds, there are no island endemic bird species. Nevertheless, the islands have been sufficiently separated from other sources of interbreeding such that at least 16 subspecies have been described from Aruba, Bonaire and Curação. Eleven of these species breed on Curação, and two are totally restricted to the island, namely the Brown-throated Parakeet Aratinga pertinax pertinax and the Barn Owl Tyto alba bargei. A subspecies of Grasshopper Sparrow Ammodramus savannarum caribaeus found only on Curação and Bonaire appears vocally distinct from other North American and Caribbean forms. Similarly, vocalisations of White-tailed Nightjar Caprimulgus cayennensis insularis from Curação and Bonaire are distinct from mainland forms, but further taxonomic research is needed on all of these subspecies. Curação's resident avifauna is a rather unique, with species of West Indian origin mixed with those of South American origin. This is demonstrated by the presence of a Northern South America biome-restricted bird, the Bare-eyed Pigeon Patagioenas corensis as well as a number of more wide ranging South American species. Caribbean Elaenia Elaenia martinica, the only restricted-range bird on the island (part of the Netherlands Antilles secondary Endemic Bird Area), is one of the West Indian birds found on the island.



Klein Curação IBA, globally significant for nesting Least Terns. (PHOTO: ADOLPHE DEBROT)

Curaçao is globally important for its nesting terns (Common Tern Sterna hirundo and Least Tern S. antillarum) and for the Near Threatened Caribbean Coot Fulica caribaea, the national population sizes of which are listed in Table 1. Just two species of tern (listed above) currently nest on Curaçao, but Royal Tern S. maxima, "Cayenne" Tern S. sandvicensis eurygnatha and Roseate Tern S. dougalli all bred during the twentieth century. The relatively large size of Curaçao, the wide variety of habitats, and the more pristine and diverse state of its vegetation compared to the smaller and still more pastoral neighbouring islands of Aruba and Bonaire, mean that Curaçao provides some of the best opportunities for protecting native bird diversity in the Leeward Netherlands Antilles.

IMPORTANT BIRD AREAS

Curaçao's five IBAs—the island's international priority sites for bird conservation—cover 16,280 ha (including marine areas) and c.24% of the land area. At 13,555 ha the Northeast Curaçao parks and coast IBA (AN015) makes up c.83% of this IBA coverage. The North-east Curaçao parks and coast IBA embraces Curaçao's two terrestrial national parks (totalling c.2,300 ha). The remainder of the IBA is a Protected Conservation Area, a designation common to part of the Malpais-Sint Michiel IBA (AN016) and the Jan Thiel Lagoon IBA (AN018) although in none of these areas is there active

management for conservation. Muizenberg IBA (AN017) is designated as protected parkland, but also suffers from a lack of active management. Klein Curaçao IBA (AN019) is not protected in any way. The IBAs have been identified on the basis of five key bird species (see Table 1) that variously trigger the IBA criteria. Each of these birds occurs in two or more IBAs although the majority of the Near Threatened Caribbean Coot *Fulica caribaea* occur in the threatened and unmanaged Muizenberg IBA (AN017).

Caribbean Coot and Caribbean Flamingos at Muizenberg IBA. (PHOTO: ADOLPHE DEBROT)



| | | | | | Curação IBAs | | | | | | | | | | | | | | |
|---------------------------------------|--|---|-------|----------|--------------|-------|-------|-------|-------|--------------------------------|-------|-----|---------------------|---|---|-----|-----|---|--|
| | | | | | AN015 | AN016 | AN017 | AN018 | AN019 | | | | | | | | | | |
| | | | | Criteria | : | | • | | | | | | | | | | | | |
| | | | | | | | | | | Key bird species | Crite | ria | National population | 5 | • | • | • | • | |
| | | | | | | | | | | Caribbean Coot Fulica caribaea | NT 🔳 | • | 1,000 | | | 100 | 800 | | |
| Common Tern Sterna hirundo | | • | 400 | | | 45 | | 225 | | | | | | | | | | | |
| Least Tern Sterna antillarum | | • | 1,860 | | 514 | | | 10-60 | 858 | | | | | | | | | | |
| Bare-eyed Pigeon Patagioenas corensis | | | | | ✓ | 600 | | | 1 | | | | | | | | | | |
| Caribbean Elaenia Elaenia martinica | | | | | / | ✓ | | | | | | | | | | | | | |

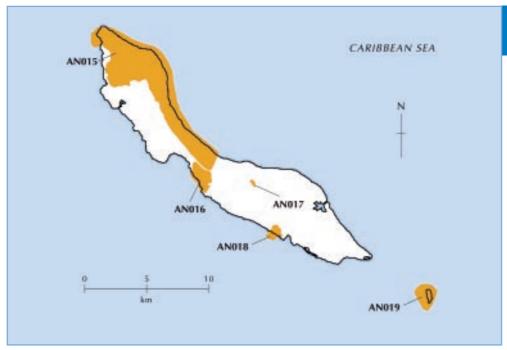


Figure 1. Location of Important Bird Areas in Curação.



Jan Thiel Lagoon IBA. (PHOTO: ADOLPHE DEBROT)

All of the IBAs have urgent management requirements if the populations of the birds for which they are internationally important are to thrive. However, securing disturbance free zones around the tern nesting colonies appears to be one of the greatest needs. If implemented effectively, the tern populations would increase dramatically (as seen at the protected colonies on Aruba) and perhaps some of the 1,200 pairs of "Cayenne" Tern S. sandvicensis eurygnatha that used to breed (pre-1962) at Jan Thiel Lagoon IBA might return.

Monitoring the populations of the terns and waterbirds should be used for the assessment of state, pressure and response variables at each of Curaçao's IBAs in order to provide an objective status assessment as well as to highlight management interventions that might be required to maintain these internationally important biodiversity sites.

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■ Site description

North-east Curação parks and coastal IBA extends along coast from Westpunt and Noordpunt at the northern end of island around the northern tip and east along coast through Playa Grandi and ending near Hato airport. At the northern end of the island it extends inland from the 100-ha coastal Shete Boka National Park to include the 2,000-ha Christoffel National Park. The area comprises coastal limestone terraces and inland hills supporting evergreen woodland, coastal lagoons with sea grass beds and mangroves, and dry deciduous shrubland on volcanic soils. Christoffel National Park supports one of largest contiguous blocks of shrubland remaining on island.

Birds

This IBA is regionally significant for its breeding colony of 500+ Least Terns *Sterna antillarum*. There is a Brown Booby *Sula leucogaster* roosts of c.12 birds within the IBA, and just offshore are important feeding areas for this species and the terns. The Netherlands Antilles secondary EBA restricted-range Caribbean Elaenia *Elaenia martinica*, and the Northern South America biome-restricted Bare-eyed Pigeon *Patagioenas corensis* are both numerous. The shrubland is important for the endemic subspecies of Brown-throated Parakeet *Aratinga pertinax pertinax*. In total, 10 (of the 11) Leeward Netherlands

Antilles endemic subspecies of birds breed in this IBA which is also important for large numbers of Neotropical migrants.

Other biodiversity

The Shete Boka National Park is a nesting area for three globally threatened sea-turtle species. The Christoffel National Park supports c.50 rare plant species (that are found almost entirely within the park boundaries) and seven rare mammal species. The Hato area is home to c.55 Leeward Netherlands Antilles endemics or near-endemics.

Conservation

This IBA is largely state owned. The Shete Boka and Christoffel national parks are managed by the CARMABI Foundation, and the rest is legally designated as Protected Conservation Area but is unmanaged. Extensive research on all aspects of the ecology, biology and geology of this area has been carried out by CARMABI and visiting scientists. The tern colonies are threatened by disturbance from humans, and disturbance and predation from feral dogs and cats. Free-ranging goats have impacted the shrubland in Christoffel National Park, but eradication measures have lead to a recovery in vegetation. Elsewhere, illegal livestock rearing is increasing, as is illegal dumping, and effective management is urgently needed.



■ Site description

Malpais—St Michiel IBA is on the southern side of central Curaçao. It is an area of basalt rock over-capped by coralline limestone hills. Malpais is a former plantation, just north of St Michiel Bay. The IBA is diverse, including: two freshwater lakes (created by a dam) which retain at least some water during most dry seasons; a hyper-saline lagoon at St Michiel (on the south coast c.5 km north-west of Willemstad, lying inland from the coral reef-fringed bay); dry deciduous vegetation (on the volcanic soils); and a well developed *Coccoloba swartzii—Erithal fruticosa* woodland habitat on the limestone. The island's increasingly large dumpsite is just north and upstream of the Malpais freshwater ponds.

Birds

This IBA is significant for the Near Threatened Caribbean Coot *Fulica caribaea* which breeds at Malpais (numbers regularly exceed 100). The shrubland is important for the Netherlands Antilles secondary EBA restricted-range Caribbean Elaenia *Elaenia martinica*, and the Northern South America biome-restricted Bare-eyed Pigeon *Patagioenas corensis* (up to 600 roost below Malpais dam, along with c.165 Brown-throated Parakeets *Aratinga pertinax*). The St Michiel lagoon supports a globally important population (15 pairs) of Common Tern *Sterna hirundo*, and is one of a network

of sites supporting Curação's Caribbean Flamingos *Phoenicopterus ruber*.

■ Other biodiversity

The endemic freshwater fish *Poecilia vandepolli* is present in the lakes. Endemic land-snails are present, as are a number of endemic plant species. The IBA is floristically important.

Conservation

Malpais-St Michiel IBA is under mixed (private and state) ownership. The Malpais area is managed as part of a conservation area and has excellent well-signed and designated hiking trails which are maintained by the local conservation organisation Uniek Curação. The dumpsite (and pig farm) near the Malpais ponds pose a potential threat of wetland contamination. Uncontrolled recreational access by hikers (and dog walkers) is a threat to birds and other fauna. Poor maintenance of the dam may result in one of the two lakes drying out during prolonged dry seasons, significantly decreasing the area's value for waterbirds and the endemic fish. The main threat at St Michiel is uncontrolled public access that disturbs the flamingos (the nesting terns are located on the less disturbed west side of the lagoon). The CARMABI Foundation and Zoological Museum of Amsterdam have carried out research in this IBA.



■ Site description

Muizenberg IBA comprises an intermittent shallow lake/ wetland in the northern suburbs of Willemstad, central Curaçao. The wetland has been created by the damming of a stream that drains the surrounding low hills. It is bounded on all sides by busy roads (on the west side the roads abut the wetland). On the north-east side the area is flanked by agricultural lands with small farms. The wetland typically retains some water for more than six months each year (and in wetter years water can be present year-round). Periodically inundated grassland and shrubland surround the wetland. A separate small pond (Kaya Fortuna) is situated 200 m west of Muizenberg.

Birds

This IBA is significant for its population of Near Threatened Caribbean Coot *Fulica caribaea*. The species is a resident breeder, with congregations of up to 800 birds during the wet season.

Caribbean Flamingos *Phoenicopterus ruber* occasionally feed in the wetlands, with flocks of up to 170 birds recorded. Many other waterbirds (both residents and migrants) are supported within this IBA.

Other biodiversity

The endemic freshwater fish *Poecilia vandepolli* is present in this wetland.

Conservation

Muizenberg IBA is state owned and legally designated as protected parkland, although it is not being actively managed. Although it is one of Curaçao's two most important and rare freshwater areas, no biological conservation or research projects are known to have been implemented at the site apart from the Zoological Museum of Amsterdam's 2006 inventory of waterbirds and freshwater fish. The IBA is threatened by the unregulated dumping of garbage, pollution, drainage of surrounding wetlands and recreational disturbance.



■ Site description

Jan Thiel Lagoon IBA is on the south coast of southern Curaçao, east of Willemstad. The site comprises 80 ha of hyper-saline lagoons (with islands) surrounded by c.228 hectares of dry deciduous woodlands and (on the limestone) evergreen shrubland. The vegetation near the margins of the lagoon is characterised by water and salt-tolerant tree species. There is also one spring and several abandoned dams within the IBA which support fresh water during the rainy season, significantly increasing the diversity of habitats. Hotels and resorts surround the lagoon.

Birds

This IBAs population of Common Tern Sterna hirundo (75 pairs) is globally significant, while the fluctuating population of 10–60 pairs of Least Tern S. antillarum is regionally so. Up to 1,200 pairs of Sandwich Tern S. sandvicensis used to breed (pre-1962) but disturbance has reduced numbers to insignificant levels. The lagoon is an important foraging area for the 200–300 Caribbean Flamingo Phoenicopterus ruber that occur on the island. The IBA is also important for migratory shorebirds, other migrants, and for resident populations of at least 10 (of the 11) Leeward Dutch Antilles endemic subspecies of birds that breed on Curação.

■ Other biodiversity

Reptiles and land snails endemic to the Leeward Dutch Antilles are well represented in the IBA. Plants include the extremely rare *Vitex cymosa*—known from less than 10 trees on the island, and rare evergreen species such as *Croton niveus, Mayteneus tetragona, Schoephia schreberi* and *Adelia ricinella*.

Conservation

Jan Thiel Lagoon is a part state- and part privately-owned conservation area. A management plan developed by the CARMABI Foundation has been approved by the government, but implementation has not been financed. Uncontrolled public recreational access has resulted in a c.90% reduction of breeding terns. With adequate protection, tern (and flamingo) abundance will certainly recover. In 1999, the government proposed to build a road through the conservation area, but the plans were successfully contested in court (by the local environmental group Defensa Ambiental). An abandoned, unsealed landfill bordering the lagoon is an unquantified threat.



■ Site description

Klein Curação IBA is a small (c.170 ha), flat, offshore reef island about 10 km south-east of the south-easternmost point of Curação. The island was originally well-vegetated but was extensively mined for phosphate in the late nineteenth and early twentieth centuries and overgrazed by livestock since the 1800s. As a consequence, the island has been devoid of all trees and bushes for more than 100 years. Up until 2000 the vegetation consisted of a few small herbs and grasses but since a highly successful restoration project, the native flora has grown and landscape changes are taking place rapidly.

Birds

This IBA is significant for its breeding population of Least Tern Sterna antillarum, 286 of which nested in 2002, making this globally important. Historically, far greater numbers of terns bred at this IBA. Bare-eyed Pigeon Patagioenas corensis—the only Northern South America biome-restricted species occurring in Curação—has been recorded on this island. House Sparrow Passer domesticus colonised in the 1990s

Other biodiversity

Klein Curação is the most important sea turtle nesting beach

within Curaçao's jurisdiction, with Endangered loggerhead Caretta caretta and green Chelonia mydas, and Critically Endangered hawksbill Eretmochelys imbricata turtles nesting. The island was historically important for the now extinct Caribbean monk seal Monachus tropicalis. The island is surrounded by a luxuriant reef system.

Conservation

The island is state owned, legally designated as "open land", and thus has no protected status (in spite of requests for such by the CARMABI Foundation). Feral goats were eradicated from the island in 1996 by the Curação Agriculture and Animal Husbandry and Fishery Service. Feral cats were eliminated by CARMABI in 2004. These two successful eradications have paved the way for ecological recovery which has been assisted (since 2000) by CARMABI through the planting of drought and salt resistant native trees, shrubs, herbs and grasses. These plants are now spreading naturally over the island. Based on the vegetation recovery attained, the first native land bird (Bananaquit Coereba flaveola) was reintroduced from Curação in 2005 and has since been breeding. The island's main threat is now disturbance from uncontrolled recreational access by over 600 visitors per week (in 2006).