

Curaçao

Proposed Ramsar area “Malpais/Sint Michiel”

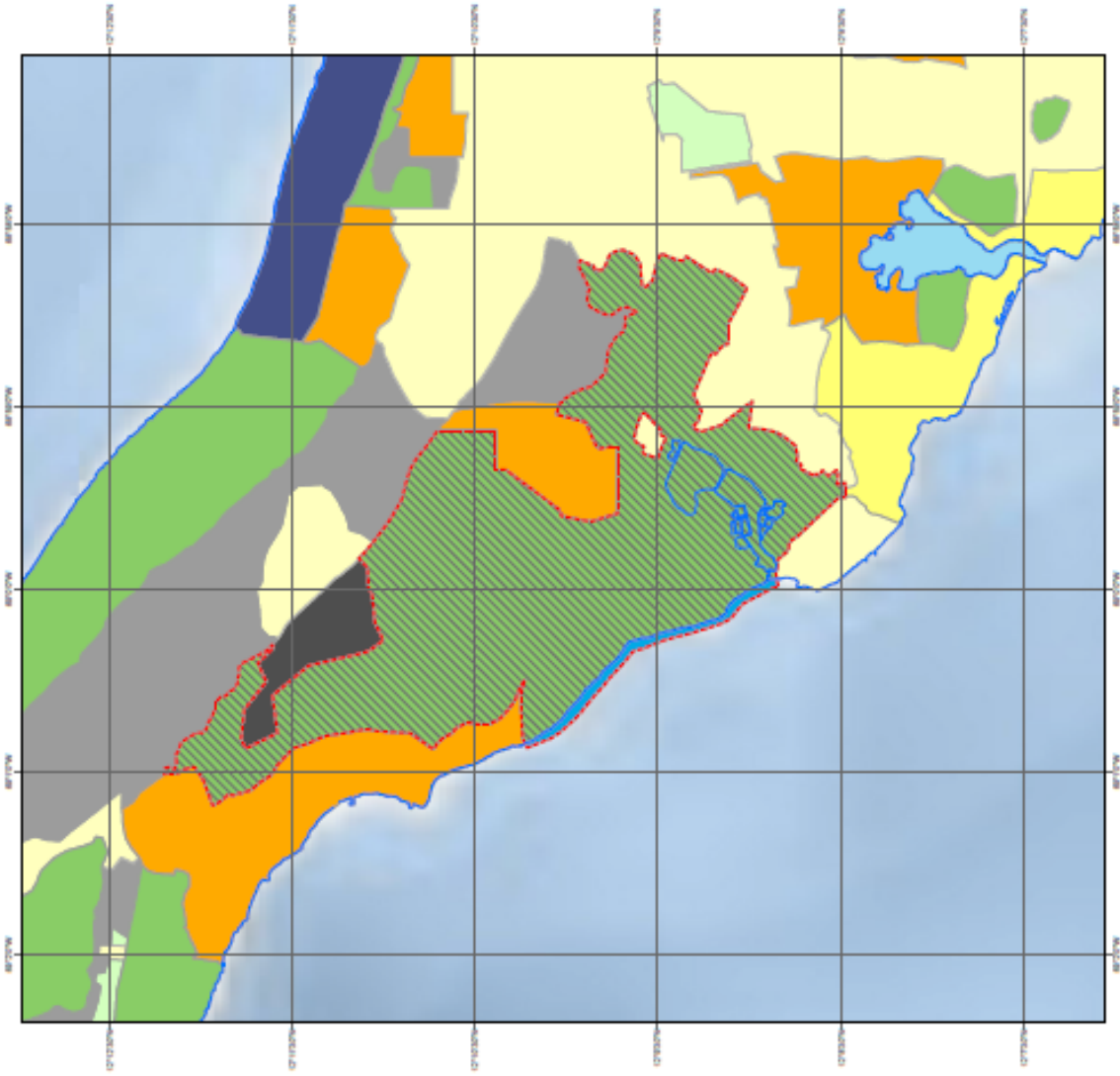
Photographic impressions and map of the proposed Ramsar Area

1. Aerial view of the lagoon of St. Michiel. The lagoon is connected to the open ocean on its south side by a small man-made channel. .
2. Migratory and nomadic birds, such as ducks and coots (shown here), use the area to overwinter or as a breeding habitat. The Caribbean coot is endemic to the Caribbean region and considered uncommon to rare on most of the Greater Antilles.
3. The lagoon near St. Michiel supports a significant fraction of the global population of the Common tern (Meuchi pik Kòrá, *Sterna hirundo*) and is part of a regional network of foraging sites for the Caribbean flamingo (*Phoenicopterus ruber*, Chochogo).
4. Malpais is a former plantation, just north of Sint Michiel Lagoon. The area harbors various ecosystem types. There are two freshwater lakes that hold fresh water during most dry seasons.
5. More than 160 Brown-throated parakeets (*Aratinga pertinax*, Prikichi) roost at the lower side of the Malpais dam.
6. Coral cover can locally be high, but most reefs occur as small scattered patch reefs along the coast in this area.
7. As freshwater habitats are very scarce on the island, the catchment basin of Malpais is one the few sources of freshwater for the endemic White-tailed deer (*Odocoileus virginianus curassavicus*, Biña).
8. The small fishing village of Boka St. Michiel that lies near the seaward opening to the St. Michiel Lagoon.
















Malpais/Sint Michel

SCALE 1 : 40 000



LEGEND

-  Ramsar
-  Coastline
-  Buffer zone
-  Waters down to 60 m depth
-  Urban areas
-  Industrial areas
-  Airport
-  Touristic areas
-  Agriculture areas
-  Conservation areas
-  Open land
-  Water
-  Undefined land use



Information Sheet on Ramsar Wetlands

(RIS) – 2009-2012 version

Available for download from http://www.ramsar.org/ris/key_ris_index.htm.

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated: November 11 2012

3. Country: Curaçao, Kingdom of the Netherlands

4. Name of the Ramsar site: Malpais/Sint Michiel

5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only):

- a) Designation of a new Ramsar site ; or
 b) Updated information on an existing Ramsar site

7. Map of site:

a) A map of the site, with clearly delineated boundaries, is included as:

- i) a hard copy (required for inclusion of site in the Ramsar List): ;
- ii) an electronic format (e.g. a JPEG or ArcView image) ;
- iii) a GIS file providing geo-referenced site boundary vectors and attribute tables .

b) Describe briefly the type of boundary delineation applied: The area of Malpais/Sint Michiel was designated as an Important Bird Area (IBA AN0016) in 2007 (Debrot & Wells 2008) and as a conservation area in 1995 by means of the island zoning plan locally known as the EOP (“Island Development Plan”) (A. B. 1995, no.36). The Ramsar site follows the same delineations as these conservation areas. The wetland itself comprises the waters of a hyper-saline lagoon, up to the high water mark and the lands that support temporary freshwater lakes. At its south side, it also includes coastal waters down to 60 m depth to include

the fringing reefs that occur in this area. The lands designated as “conservation area” surrounding the wetlands act as a buffer zone.

8. Geographical coordinates: Approximate centre of the area: Latitude: 12°10'N Longitude 69°00'W

9. General location: Curaçao is an oceanic island in the Southern Caribbean Ecoregion. It lies approximately 70 km north of Venezuela and is part of the Leeward Antilles. The proposed Ramsar area “Malpais/Sint Michiel” is located on the southern side of the island, east of Bullenbaai and approximately 7 km west from Willemstad, the capital city of Curaçao which has 149.679 inhabitants (Central Bureau of Statistics Curaçao, 2011)

10. Elevation: (in metres: average and/or maximum & minimum)

Minimum: 0 m, Maximum: approximately 100 m (ASL)

11. Area: (in hectares) 1,100 ha

12. General overview of the site: Malpais is a former plantation, just north of Sint Michiel Lagoon. The area harbors various ecosystem types. There are two freshwater lakes that hold fresh water during most dry seasons; a hyper-saline lagoon (St. Michiel) connected to a bay in which coral reefs are found; dry deciduous vegetation and a well developed woodland habitat. The area provides a habitat for the Caribbean coot (*Fulica caribaea*, Kùt, Near Threatened under the IUCN Red List) that breeds at Malpais. The lagoon supports a significant fraction of the global population of the Common tern (Meuchi pik Kòrà, *Sterna hirundo*) and is part of a regional network of foraging sites for the Caribbean flamingo (*Phoenicopterus ruber*, Chochogo, conserved through CMS).

13. Ramsar Criteria:

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9

14. Justification for the application of each Criterion listed in 13 above:

Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.

Natural freshwater lake habitats are scarce in the Southern Caribbean Ecoregion and artificial lakes are generally only present during and immediately after the rainy season. Local circumstances sometimes allow freshwater lakes to persist for periods up to several months and Malpais represents one of only two persistent freshwater habitat sites on the island of Curaçao. At Malpais, rainfall from nearby hills collects behind a 100m long dam. Depending on the amount of precipitation, the resulting wetland will cover several hectares and locally reaches its maximum depth of approximately 5 meters. The water can persist for more than a year after periods of exceptional rainfall (Voous 1985). The wetlands and surrounding vegetation, imbedded within the otherwise dry habitat of the island, provide suitable habitats for migratory and nomadic waterfowl (Voous 1982) and as a result, the areas was recommended for designation as a wetland reserve as early as 1972 (Bokma 1972).

Criterion 3: A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.

The Caribbean coot is endemic to the Caribbean region and considered uncommon to rare on most of the Greater Antilles and an irregular breeder or vagrant on the Lesser Antilles south to Trinidad (Prins et al. 2005; Rafaele et al.1998). At the proposed Ramsar site 200 to 400 coots are found at any time and are present year-round in most years. They also breed in this area (Debrot & Wells 2008). The saline lagoon of Sint Michiel represents an important foraging area for the Caribbean flamingo (Chochogo, *Phoenicopterus ruber*) which is listed as Conserved Through Agreements under appendix II of the Convention on Migratory Species (Debrot & Wells 2008). As freshwater habitats are very scarce on the island, the catchment basin of Malpais is one of the few sources of freshwater for the endemic White-tailed deer (*Odocoileus virginianus curassavicus*, Biña) and therefore likely plays a critical role in this endemic species' survival on the island (Debrot & de Freitas 1991). See point 20 for further endemic species.

Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.

Migratory and nomadic birds, such as ducks and coots, use the area to overwinter or as a breeding habitat. Voous (1983) listed seven aquatic birds that breed at Malpais, including the Bahama pintail (*Anas bahamensis*, Patu di aña), the American coot (*Fulica americana*, Kùt), the Caribbean coot (*Fulica caribaea*, Kùt) the Common gallinule (*Gallinula chloropus*, Kedebeشي) and the Black-winged grebe (*Podilymbus podiceps*, Sambuyadó pik diki) (Debrot & de Freitas 1991). Other bird species that have occasionally been observed breeding in the area include the Common moorhen (*Gallinula chloropus*, Gaitu pik kòrá), the Least grebe (*Tachybaptus dominicus*, Sambuyadó chikí) and the Black-crowned Night heron (*Nycticorax nycticorax*, Krabèchi bachi pretu)(BirdLife International 2011).

Sint Michiel lagoon supports growing populations of the Caribbean flamingo (*Phoenicopterus ruber*, Chochogo) during the dry season when the larger wetlands of Venezuela run dry (Debrot & de Freitas 1999). Furthermore, the increased abundance of flamingos on Curaçao since the early 90's suggests that the (growing) breeding population on the nearby island of Bonaire (up to 1,300 pairs nesting in Pekelmeer Saltworks IBA/Breeding Reserve/Ramsar site (Wells & Debrot 2008)) is spreading out and has started colonizing suitable habitats on neighboring islands, such as Curaçao (Debrot & de Freitas 1999). Sint Michiel Lagoon provides important food sources for these flamingos and is part of a network of feeding sites for this species, not only on Curacao itself, but also within the Southern Caribbean Ecoregion.

Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

Sint Michiel lagoon supports nesting 15 pairs of the Common tern (*Sterna hirundo*, Meuchi pik Kòrà) (Debrot & Wells 2008), which corresponds to more than 1 % of the Caribbean population (Delaney & Scott 2006).

15. Biogeography

a) biogeographic region: Realm: Tropical Atlantic, Province: Tropical Northwestern Atlantic, Ecoregion: Southern Caribbean

b) biogeographic regionalisation scheme: Marine Ecoregions of the World (MEOW) (Spalding et al. 2007).

16. Physical features of the site:

Geology & Geomorphology- Malpais/Sint Michiel and its surroundings are situated on the early Upper Cretaceous Lava formation of Curaçao and the Quaternary Limestone Terraces. From the coast going inland, Lower Terraces are succeeded by Middle Terraces, followed by volcanic soils (De Buissonjé 1974). The lagoon of Sint Michiel lays inland from a bay bordered by fringing coral reefs. The total surface area of the lagoon is approximately 90 ha and it has an average depth of a few meters. Historically, the lagoon was separated from the open ocean by a coral rubble wall (Boekschoten 1982). Presently, a narrow canal (1-2 m wide, 0.1-0.5 m deep) cuts through the barrier of coral debris and connects the salina to the open sea. Curaçao's daily tidal range is very limited (30 cm); on a yearly base the tidal range is much higher, depending foremost on current wind conditions, and reaches about 70 cm (de Haan & Zaneveld 1959). Due to the artificial opening connecting the salina to the sea, the lagoon is presently subject to tidal pumping and as a result, Sint Michiel lagoon has a mean salinity of approximately 83 ppt, which is less than that observed for completely enclosed inland bays. Salinity levels vary throughout the lagoon depending on the distance to opening to the sea. Dissolved oxygen concentration averages around 6.3 mg/L and the average water temperature is 31 °C. Water clarity strongly varies through time depending on the amount of precipitation and ranges between 6 and 120 cm. The soil of the lagoon consists mostly of clay but also comprises silt, sand, gravel and small calcite crystals (Cuppens & Vogel 2004).

The freshwater lakes included in this proposal were formed by a human made dam that was built in the 1960s by the Shell Company. The dam is bordered by hills and freshwater accumulates behind the dam (~100m in length) so that a lake/ wetland is formed that, depending on the amount of rainfall, can cover several hectares and reach a maximum depth of about 5 meters (Debrot & Wells 2008). Freshwater persists at least during most dry seasons and the lake behind the dam is filled up completely every 4 to 6 years, during exceptional rainy seasons (F. Mercelina, Uniek Curaçao, pers. comm.).

The fringing coral reef adjacent to Sint Michiel is characterized by a narrow submarine terrace (<250 m wide) which gradually slopes from the shore to a drop-off at approximately 7 to 12 m depth. At the drop-off, the reef slopes off steeply, sometimes interrupted by a small second terrace at 50 to 60 m, and ends in a sandy plain at 80 to 90 m (Bak 1975). The bottom of the reef consists mainly of a sand layer on top of ancient reefs (Strawbridge & Sybesma 1989).

Climate- Based on the mean annual rainfall (573 mm), the climate on the island qualifies as semi-arid. Annual variations in temperature are small and average around 28 °C. Precipitation levels differ throughout the year and in the period between October and January rainfall is higher than all other months and generally referred to as the wet season (Meteorological Services of the Netherland Antilles and Aruba 2008).

17. **Physical features of the catchment area:** see previous section.

18. **Hydrological values:** Freshwater is scarce on Curaçao and therefore of great ecological, social and economic value. As the dam of Malpais is located downstream of a natural gully, running water travels downstream till freshwater becomes caught in the basin behind the dam where it infiltrates into the soil where it recharges ground water reservoirs (Henriquez 1962) and allows woodlands to grow in the area year round that support many animal species during long periods of drought. Populations of branching coral species also dissipate wave energy and thus reduce coastal erosion (Mumby et al. 2008).

19. Wetland Types

a) **presence:**

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) **dominance:** J-6-C-A-G-D-5

20. **General ecological features:** The Malpais/Sint Michiel area comprises 5 different habitats, including two freshwater lakes; one saline lagoon at Sint Michiel, coral reefs, dry deciduous vegetation and a well developed woodland habitat. The combination of the 5 habitats supports a great variety of bird species, aquatic freshwater and marine organisms, several mammal species and various ecologically important or rare plant species (Debrot & de Freitas 1991).

Freshwater lakes- Natural freshwater lake habitats are scarce in the Southern Caribbean Ecoregion and artificial lakes are generally only present during and immediately after the rainy season. Local circumstances sometimes allow freshwater lakes to persist for periods up to several months and Malpais represents one of only two persistent freshwater habitat sites on the island of Curaçao. The wetlands and surrounding vegetation, imbedded within the otherwise dry habitat of the island, provide suitable habitats for overwintering and breeding populations of waterbirds and the endemic Curaçao White-tailed deer. When the water level inside the wetlands drops, vegetation starts growing which attracts insects, which are an important food source for several bird species. The organic matter left behind by these plants, insects and birds when the dam is dry fuels aquatic life when freshwater comes back during the wet season (F Mercelina, Uniek Curaçao, pers. comm.).

Saline lagoon habitat- The vegetation of Sint Michiel lagoon includes the Scarlet ammannia (*Ammannia coccinea*), the Burhead (*Echinodorus berteroi*) and the Waterlelie (*Nymphaea ampla*, Leli di awa) (Debrot & de Freitas 1991). Large numbers of seeds of the seagrass *Ruppia maritima* are present in the sediment and compose more than 95% of the biomass of potential food species for the flamingos. In the water column, copepods are the most abundant animal group that coexist with very low abundances of *Artemia* (Cuppens & Vogel 2004). Since the salinity of the lagoon is below 130 ppt., euryhaline fish (*Cyprinodon dearborni* and *Poecilia vandepolli*) are able to survive and prey on the Brine shrimp (*Artemia salina*) and the larvae of the Brine fly (*Ephydra cinerea*) populations (Kristensen & Hulscher- Emeis 1972) which likely explains their low abundance

inside the lagoon. Low herbaceous vegetation (mainly halophilic species dominated by *Sesuvium salina*) occurs on both the north and south edges of the salina, where it is subjected to occasional flooding. Northwest of the salina, a *Conocarpus-Euphorbia* salina vegetation is present, indicative of human disturbance (Beers et al. 1997). The western coast of the Sint Michiel lagoon is dominated by dense, mostly impenetrable, thorny trees (*Acacia-Croton* vegetation type). The Limestone Terraces farther inland are mostly covered by sparse and low herb and shrub vegetation, with scattered large trees of different species. The steep escarpments on both sides of the salina are covered by a *Bourreria-Acacia turtosa* vegetation unit (Beers et al. 1997).

Shrubland and Woodland- The freshwater dam of Malpais is surrounded by an *Acacia-prosopis* vegetation comprised of dense thorny vegetation and cacti. Low shrub and locally dense forests are also found in the area. Two patches of the noteworthy vegetation type *Hippomane-Rooi* cover a small area of the site (Beers et al. 1997). This vegetation type occurs in the lowest parts of the island, where they can only survive when running water coming down from gullies is present. This vegetation type is of great importance to many bird species, iguanas and bats, but also for the endemic White-tailed deer, especially during dry season when this vegetation is an alternative source of freshwater if the dam turns dry (F Mercelina, Uniek Curaçao, pers. comm.).

Coral reef- The reef flat west of the lagoon shelters scattered populations of the Elkhorn coral (*Acropora palmata*, Koral kachu grandi, Critically Endangered, IUCN Red List), fields of Fire coral (*Millepora complanata*, Brantkoral) and large stands of gorgonians. These communities provide significant ecological processes and services (Mumby et al. 2008). Elkhorn coral communities positively support biogeochemical cycling, gross community calcification and nitrogen fixation. Populations of this branching coral species also dissipate wave energy and thus reduce coastal erosion (Mumby et al. 2008) and provide shelter to an enormous amount of other reef organisms (Gladfelter & Gladfelter 1978). Both Elkhorn coral and fire corals provide shelter to juvenile fish, thus supporting productive fish communities (Nagelkerken 1974).

21. Noteworthy flora: Limestone Terraces and the Curaçao Lava Formation (diabase) are the predominant terrestrial substratum types on the island of Curaçao. In contrast to the limestone vegetation, diabase vegetation has been heavily affected by urbanization and agricultural land use so that areas of pristine or less-disturbed diabase vegetation types are currently rare on the island. However, in the Malpais area, the diabase hill vegetation remains in a relatively pristine state. Rare plant species are still found in this area and include the Jequirity (*Abrus peratorius*, Makurà), the Sprainbush vine (*Cardiospermum halicacabum*), the Christmasbush (*Senna bicapsularis*, Bruska), the Garlic pear tree (*Cratogeomys tapia*, Surun di mondi), the Oba shimaron (*Geoffroea spinosa*) and the Brush holly (*Xylosoma flexuosum*) (Debrot & de Freitas 1991).

22. Noteworthy fauna:

Birds (Aves)- The shrubland is important for the on the ABC islands endemic Caribbean elaenia (*Elaenia martinica*, Wimpi) and the Bare-eyed pigeon (*Patagioenas corensis*, Ala blanca) that only occurs in the northern parts of South America. Of the latter species 600 individuals roost at the lower side of the Malpais dam along with more than 160 Brown-throated parakeets (*Aratinga pertinax*, Prikichi) (Debrot & Wells 2008). The area also harbors the rare endemic Curaçao Barn Owl (*Tyto alba*, Palabrua) that nests in the limestone cliffs found throughout the area. The rare Yellow-billed cuckoo (*Coccyzus americanus*, Cucu pico hel) and the Scaly-napped pigeon (*Patagioenas squamosa*, Blauduif) are common in this area around October (BirdLife International 2011).

Mammals (*Mammalia*)- Curaçao is one of the two Caribbean islands with a White-tailed deer (*Odocoileus virginianus curassavicus*, Biña) population that was likely already present since pre-Columbian times (Husson 1960). The Curaçao White-tailed deer is distinct from related north Venezuelan deer by more distinct neck and antorbital markings. The current population size on Curaçao is estimated at no more than a few hundred animals at most. Malpais is one of the few publicly accessible areas where the deer can still be observed. An aerial survey conducted in 1983 estimated the Malpais subpopulation at approximately 20-30 animals (S.O.V.O. 1983). The catchment basin is on the few sources of freshwater for the deer of Malpais and therefore plays a critical role in their survival (Debrot & de Freitas 1991). The endemic Cotton-tail hare (*Floridensis nigronuchalis nigronuchalis*, Konènchi) is also widely abundant in the area (VF Chamberland, pers. obs.).

Others- The area supports several or possibly all of the seven bat species known for Curaçao, various reptile species as well as various endemic land snail species (BirdLife International 2011).

23. Social and cultural values: Ruins of an old indigo dye extraction system were discovered in the area. The natural dye was extracted from a plant, the Indigo shimaron (*Indigofera suffruticosa*), an economically important plant once blue dyes were rare. Ruins of the old Fort Sint Michiel and wall are still present in the area. The salina of Sint Michiel was used for salt extraction in the past and saltpans are still present (F Mercelina, Uniek Curaçao, pers. comm.).

The area is used for recreational purposes (hiking, biking, camping), but also for educational guided tours. It is considered of scenic value by the local population of the nearby town of Sint Michiel. The resources of the area are mostly exploited by the Chinese community through the harvesting of marine organisms in the salina of Sint Michiel (F Mercelina, Uniek Curaçao, pers. comm.).

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? no

24. Land tenure/ownership¹:

a) within the Ramsar site: Malpais/St Michiel is under mixed (private and state) ownership.

b) in the surrounding area: the surroundings of the area are private properties.

25. Current land (including water) use:

a) within the Ramsar site: Malpais/Sint Michiel was given the “Conservation area” status under the island’s zoning plan, i.e., the EOP (“Island Development Plan”). The EOP (AB 1995 no. 36) came into effect on May 23, 1997. The conservation destination is attributed to areas with a scientific, historic, cultural or scenic value. Malpais/Sint Michiel is mainly used for recreation and research purposes.

b) in the surroundings/catchment: The surrounding area is mostly destined for urban development. An industrial area lies just north of the freshwater dam and comprises the island’s landfill.

26. Factors (past, present or potential) adversely affecting the site’s ecological character, including changes in land (including water) use and development projects:

a) within the Ramsar site: Small-scale salt harvesting took place in Sint Michiel in the past, by means of the construction of small crystallizers. In the mid 1960s, salt exploitation was no longer profitable and the

¹ needs formal confirmation from Curaçaoan planning department (DROV)

crystallizers were left abandoned (Debrot & de Freitas 1999). Recently, a canal was dug through the coral barrier that separated the lagoon from the open sea. Because of this man-made channel, salinity level inside the lagoon is lower than 130 ppt., allowing certain fish species to survive that reduced the abundance of Brine shrimp (*Artemia salina*) and the larvae of the Brine fly (*Ephydra cinerea*), which are preferred food species for flamingos. Therefore, these man-made connections between enclosed lagoons and the open sea have negative influence on the quality as a foraging habitat for the Caribbean flamingo (Cuppens & Vogel 2004). However, occasional inflow of sea water, through a canal or subterraneously into the salina is necessary to prevent complete evaporation of the lagoon. A system of sluices could be a good compromise to manage the salinity of the water inside the salina (Debrot 1999). A small dirt road also crosses the salina and separates it in half. Illegal dumping was common in the past but has ceased since Uniek Curaçao, a local nature organization, manages the area. Poor maintenance of the dam at Malpais may result in the desiccation of one of the two freshwater lakes during prolonged dry seasons, thus significantly decreasing the value of the area for waterbirds. While hunting and poaching of parakeet nests has decreased recently, uncontrolled recreational access by hikers who bring along dogs is a threat to both birds and other animals such as the White-tailed deer. Skelter races are sometimes held near the lagoon, but the nesting terns are located on the far west side of the lagoon, away from the most intensive disturbance related to recreational activities (BirdLife International 2011). Harvesting of marine life in the salina by the Chinese community is a problem in the area as the collection of marine organisms with large gill nets is unselective and threatens the ecological processes of the salina and also disturbs birds in the area..

b) in the surroundings/catchment:

Illegal building of houses close to the lagoon by the local community of Sint Michiel also poses a potential threat to the biodiversity found within the salina (F Mercelina, Uniek Curaçao, pers. comm.). The main threat to Sint Michiel and Malpais is leakage from the Island’s large and growing landfill and runoff from a nearby pig farm. Both the dumpsite and the pig farm are situated less than a kilometer from the area and likely contaminate the area to a presently unknown degree

27. Conservation measures taken:

a) The area has been recognized as a key bird area for many years already (e.g. Bokma 1972; Debrot & de Freitas 1991). It was attributed a conservation status in 1995 in the Island Development Plan of Curaçao, which was ratified by the Island Government in 1997. In 2007, it was also designated as an Important Bird Area (IBA AN0016) (Debrot & Wells 2008). The Ramsar site follows the same delineations as the IBA.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate): NONE

Ia ; Ib ; II ; III ; IV ; V ; VI

c) Does an officially approved management plan exist; and is it being implemented?: no

d) Describe any other current management practices:

The area is managed as part of a conservation area by a local organization Uniek Curaçao. Management is mostly achieved through maintenance and not enforcement. The area is regularly cleaned by volunteers through Uniek Curaçao.

28. Conservation measures proposed but not yet implemented: In 1998, the central government of the Netherlands Antilles ordered each island to develop policies and a legal framework to sustainably manage and

protect its natural marine and terrestrial resources (P.B. 1998, no. 49, amended in 2001, P.B. 2001, no. 41). This decision came into effect on February 1st 1999 (“Landsverordening grondslagen natuurbeheer en – bescherming”, P.B. 1999, no. 24). Specifically, this meant that islands were expected to establish nature parks and take measures to protect certain species listed in the appendices of international treaties undersigned by the former government of the Netherlands Antilles. The national legal framework for nature management and conservation, enacted in 1998 exists (Landsverordening Grondslagen Natuurbeheer), but requires implementation at present. The Ministry of Health and Environment (VOMIL) of the former Netherlands Antilles and the Dutch Ministry of Agriculture, Nature Conservation and Fisheries (LNV) have signed a memorandum of agreement for cooperation in the preparation of an Integrated Coastal Zone Management (ICZM) Plan, but so far, work on the ICZM Plan has yet to begin.

29. Current scientific research and facilities: Relatively extensive research has been conducted by staff and visiting scientists of the Carmabi Foundation in the past decades. Carmabi Foundation has for instance carried out surveys on the presence of certain vegetation types, White-tailed deer, butterflies and the rare endemic Curaçao Barn owl which nests in the limestone cliffs. Inventories of waterbirds and terrestrial birds, as well as fishes, have been carried out by the Zoological Museum of the University of Amsterdam since 2006.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site: The area is managed by Uniek Curaçao. This nonprofit organization’s goal is to maintain and improve the physical and social environment of the island and secure the livability of Curaçao for both locals and visitors. Uniek Curaçao’s mission is to promote the island in the most ecological and sustainable way. They prepare educational tools such as information booklets, videos and presentations and also offer guided tours in the area. Once designated as a Ramsar site, this area will be included in Uniek Curaçao’s educational and public awareness programs.

31. Current recreation and tourism: Recreation is mostly focused on hiking and mountain biking.

32. Jurisdiction: The Ramsar area is under the territorial jurisdiction of the Curaçao Government; the functional jurisdiction falls under the Minister of Public Health, Environment and Nature of Curaçao.

33. Management authority:

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