



# Ramsar Information Sheet

Published on 10 November 2023

## Netherlands (Kingdom of the) (Aruba) Western Wetlands



Designation date	10 November 2023
Site number	2528
Coordinates	12°35'12"N 70°02'13"W
Area	392,00 ha

RIS for Site no. 2528, Western Wetlands, Netherlands (Kingdom of the) (Aruba)

Created by RSIS V.1.6 on - 10 November 2023

## Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

## 1 - Summary

### Summary

The Western Wetlands (392 ha) comprises five locations with typical Aruban wetlands known as salina's. The five salina's are known as: Saliña Bubali, Saliña Palm Beach, Saliña Cerca, Saliña Malmok and Saliña Druif. These non-tidal, coastal salina's typically occur in lower lying depressions, at the end of a rooi (seasonal river) system and near the coast. These are coastal wetlands in proximity of the sea, where sea water may sporadically mix with fresh water to form an environment of varying salinities. The salina's Bubali, Palm Beach and Druif receive fresh water from a waste water treatment plant and have turned into more or less permanent fresh water/brackish wetland areas.

The Saliñas support a highly specialized set of life adapted to saline conditions. Plants typically are salt-tolerant, with certain grasses and grass-like plants ( e.g. Sea-purslane, Whorled Dropseed) that are adapted to the saline conditions growing along the edges of the mud flats and salt tolerant shrubs and trees commonly bordering the salina's (e.g., Buttonwood and Black Mangrove).

The marshes provide vital food and habitat for insects (e.g. butterflies and dragonflies), crustaceans (e.g. fiddler and land crabs), reptiles (e.g. Aruba Whiptail and Baker's Cat-eyed Snake), mammals (e.g. Curaçaoan Long-nosed Bat) and many bird species. The marshes offer habitat for resident (e.g., Burrowing owl) and migratory species of birds (e.g., Roseate Spoonbill, Snowy Plover).

Saliña Bubali and Saliña Druif are globally recognized as an Important Bird Area (IBA) hosting hundreds of migratory bird species every year, including many species of warblers (e.g. Northern waterthrush, Blackburnian warbler), ducks (e.g. White-cheeked pintail, Blue-winged teal) and birds of prey (e.g. Osprey and Peregrine Falcon).

## 2 - Data & location

### 2.1 - Formal data

#### 2.1.1 - Name and address of the compiler of this RIS

##### Responsible compiler

Institution/agency	Wageningen Environmental Research
Postal address	PO Box 47 6700 AA Wageningen The Netherlands

##### National Ramsar Administrative Authority

Institution/agency	Ministry of Agriculture Nature and Food Quality
Postal address	Bezuidenhoutseweg 73 P.O. Box 20401 2500 EK The Hague The Netherlands

#### 2.1.2 - Period of collection of data and information used to compile the RIS

From year	<input type="text" value="1992"/>
To year	<input type="text" value="2023"/>

#### 2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	<input type="text" value="Western Wetlands"/>
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## 2.2 - Site location

### 2.2.1 - Defining the Site boundaries

b) Digital map/image  
<1 file(s) uploaded>

Former maps	<input type="text" value="0"/>
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#### Boundaries description

Saliña's Bubali, Palm Beach, Cerca and Malmok are located in between the main hotel area and residential area of the Noord District. The Saliña's are bordered by buildings, roads their verges. Saliña Druif is situated in a more natural landscape. It encompasses the Druif wetland and watershed and extends to the north eastern coastline. All saliña's are legally protected under the nature ordinance and completely overlap with the Ramsar designation.

### 2.2.2 - General location

a) In which large administrative region does the site lie?	<input type="text" value="The Island of Aruba, which is a constituent country of the Kingdom of the Netherlands"/>
b) What is the nearest town or population centre?	<input type="text" value="District Noord (north of the capital Oranjestad)"/>

### 2.2.3 - For wetlands on national boundaries only

- a) Does the wetland extend onto the territory of one or more other countries? Yes  No
- b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party? Yes  No

### 2.2.4 - Area of the Site

Official area, in hectares (ha):	<input type="text" value="392"/>
Area, in hectares (ha) as calculated from GIS boundaries	<input type="text" value="392.309"/>

## 2.2.5 - Biogeography

### Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Marine Ecoregions of the World (MEOW)	Realm: Tropical Atlantic, Province: Tropical North-western Atlantic, Ecoregion: Southern Caribbean.

### 3 - Why is the Site important?

#### 3.1 - Ramsar Criteria and their justification

- Criterion 1: Representative, rare or unique natural or near-natural wetland types

Hydrological services provided

The Western Wetlands comprise of five locations with typical Aruban wetlands known as salina's. These non-tidal, coastal salina's typically occur in lower lying depressions, at the end of a rooi (seasonal river) system and near the coast. These low-lying marshes of Aruba buffer stormy seas, slow shoreline erosion and are an important part of the watershed, help mitigate flood damage by slowing and storing flood water, catching sediments and pollutants before they reach the ocean. Marsh vegetation and microorganisms also use and filter excess nutrients for growth that can otherwise pollute surface water such as nitrogen and phosphorus from fertilizers. Salina's Bubali, Palm Beach and Druif receive fresh water from a waste water treatment plant, turning these in more or less permanent fresh or brackish water wetlands (Bubali even received fresh water since 1972). Fresh (brackish) water ponds of this size are quite unique and rare in the Southern Caribbean region. The site ensures further (natural) water purification but is also important for groundwater recharge.

Other ecosystem services provided

The Western Wetlands support a variety of wildlife and landscapes and are especially known for bird watching, especially Bubali. An observation tower is located in the north of Bubali, which provides excellent views on the sanctuary.

- Criterion 3 : Biological diversity

Justification

More than 120 bird species are recorded in the Western Wetlands. Often numbering several thousands during peak migration periods. Some species are year-round residents and nest within the Western Wetlands others use it during migration from either South or North America. The wetlands serve as one of few resting or sheltering areas for migratory birds, particularly shorebirds, waterfowl and north American terrestrial bird species, particularly warblers.

- Criterion 4 : Support during critical life cycle stage or in adverse conditions

Optional text box to provide further information

The wetlands are important nesting areas and serve as one of few resting or sheltering areas for migratory birds, particularly shorebirds, waterfowl, and north American terrestrial bird species, particularly warblers.

#### 3.2 - Plant species whose presence relates to the international importance of the site

Phylum	Scientific name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
<b>Plantae</b>								
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Avicennia germinans</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	LC	<input type="checkbox"/>	SPAW Annex 3	
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Conocarpus erectus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	LC	<input type="checkbox"/>	SPAW Annex 3	
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Sesuvium portulacastrum</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	LC	<input type="checkbox"/>		
TRACHEOPHYTA/LILIOPSIDA	<i>Sporobolus pyramidatus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		

#### 3.3 - Animal species whose presence relates to the international importance of the site

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
<b>Others</b>																	
CHORDATA/ REPTILIA	<i>Cnemidophorus arubensis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Endemic on Aruba	Resident
CHORDATA/ REPTILIA	<i>Leptodeira bakeri</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Resident
CHORDATA/ MAMMALIA	<i>Leptonycteris curasoae</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input type="checkbox"/>	<input type="checkbox"/>		Indigenous
<b>Fish, Mollusc and Crustacea</b>																	
ARTHROPODA/ MALACOSTRACA	<i>Cardisoma guanumi</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		
ARTHROPODA/ MALACOSTRACA	<i>Minuca rapax</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		
<b>Birds</b>																	
CHORDATA/ AVES	<i>Anas bahamensis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Migratory
CHORDATA/ AVES	<i>Anas discors</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		Migratory
CHORDATA/ AVES	<i>Aratinga pertinax arubensis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	Endemic on Aruba	Resident
CHORDATA/ AVES	<i>Athene cucularia arubensis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	Endemic on Aruba	Breeding
CHORDATA/ AVES	<i>Butorides virescens</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		Breeding
CHORDATA/ AVES	<i>Caprimulgus cayennensis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		Breeding
CHORDATA/ AVES	<i>Charadrius nivosus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>		Migratory
CHORDATA/ AVES	<i>Chrysolampis mosquitus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Breeding
CHORDATA/ AVES	<i>Coereba flaveola</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Breeding
CHORDATA/ AVES	<i>Egretta caerulea</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Regular visitor and irregular breeding bird.
CHORDATA/ AVES	<i>Falco peregrinus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Migratory
CHORDATA/ AVES	<i>Fulica americana</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30		0.9	LC	<input type="checkbox"/>	<input type="checkbox"/>		>30 breeding pairs and 110 individuals.
CHORDATA/ AVES	<i>Gallinula chloropus galeata</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		Resident
CHORDATA/ AVES	<i>Pandion haliaetus carolinensis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Migratory
CHORDATA/ AVES	<i>Parkesia noveboracensis</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/ AVES	<i>Patagioenas corensis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Breeding
CHORDATA/ AVES	<i>Phalacrocorax brasilianus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	400				<input type="checkbox"/>	<input type="checkbox"/>		Breeding
CHORDATA/ AVES	<i>Platalea ajaja</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Breeding
CHORDATA/ AVES	<i>Podilymbus podiceps</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Breeding
CHORDATA/ AVES	<i>Setophaga fusca</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA/AVES	<i>Setophaga petechia</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Breeding
CHORDATA/AVES	<i>Tachybaptus dominicus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Breeding
CHORDATA/AVES	<i>Zenaida auriculata</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Breeding

1) Percentage of the total biogeographic population at the site

The list of plant and animal species was compiled with support of Fundacion Parke Nacional Aruba (FPNA) in collaboration with local nature NGO Aruba Birdlife Conservation (ABC). The actual list of birds is much longer (see Bird Wildlife of Aruba, Peterson & Peterson-Bredie, 2016).

Bubali Wetlands is a significant nesting area for the Near Threatened Caribbean Coot (*Fulica caribbaea*) More than 30 pairs are known to breed and up to 110 birds (almost 1% of the world population) has been recorded. Other nesting species are Common Moorhen (*Gallinula chloropus*), White-cheeked Pintail (*Anas bahamensis*, 25+ prs.), Least Grebe (*Tachybaptus dominicus*), Pied-billed Grebe (*Podilymbus podiceps*) and Green Heron (*Butorides virescens*).

The mixed desert scrub vegetation along the south (seaward) side of the Bubali wetland contains nesting White-tailed Nightjar (*Caprimulgus cayennensis*), Yellow warbler (*Dendroica petechia*), Burrowing Owl (*Athene arubensis*), Ruby-topaz Hummingbird (*Chrysolampis mosquitos*), Eared Dove (*Zenaida auriculata*), Common Ground Dove (*Columbina passerine*), Bare-eyed Pigeon (*Patagioenas corensis*) and Bananaquit (*Coereba flaveola*) amongst others. A large roost of up to 400+ individual Neotropic Cormorants (*Phalacrocorax brasilianus*) occupies a section of trees on the south side of the Bubali wetland. The wetland contains several hundreds of shorebirds during spring and autumn migration during which time the entire area contains several species of neo-tropical passerines, particularly warblers and flycatchers.

### 3.4 - Ecological communities whose presence relates to the international importance of the site

<no data available>



## 4 - What is the Site like? (Ecological character description)

### 4.1 - Ecological character

Saliñas are shallow, semi-enclosed saltwater bodies mainly associated with drainage areas along the coast. These were mostly formed at the end of the great ice age as shallow terminal stages of former inner bays. On an annual basis are saliñas subject to strong fluctuations in salinity, from almost sweet to hypersaline circumstances.

Bubali, Palm Beach and Druif however are former salinas which currently receive fresh water from a waste water treatment facility (Bubali even since 1972), turning it into man-made fresh water/brackish wetlands. The vegetation in Bubali and Palm Beach is dominated by Buttonwood (*Conocarpus erectus*) and Southern Cattail (*Typha domingensis*) (Halewijn et al., 1992). Bubali and Palm Beach form a mosaic of mudflats, dense vegetation, terrestrial vegetation and open and deep water areas. Rapidly expanding aquatic vegetation and reeds can significantly reduce the area of open water. Mixed desert scrub vegetation border Bubali and Palm Beach on the west (seaward) side.

Bubali is a significant nesting area for the Near Threatened Caribbean Coot (>30 pairs known to breed and up to 110 birds have been recorded), as well as for Common Moorhen, White-cheeked Pintail (25+ prs.), Least Grebe, Pied-billed Grebe and Green Heron.

The mixed desert scrub vegetation along the south (seaward) side of the wetland contains nesting White-tailed Nightjar, Yellow warbler, Burrowing Owl, Ruby-topaz Hummingbird, Eared Dove, Common Ground Dove and Bannaquit amongst others. A large roost of up to 400+ individual Neotropical Cormorants occupies a section of trees on the south side of the wetland. The wetland contains several hundreds of shorebirds during spring and autumn migration during which time the entire area contains several species of neo-tropical passerines, particularly warblers and flycatchers.

Salina Druif also turned into a more or less permanent fresh water lake currently hosting nests of White Cheeked Pintails and Common Gallinule.

Malmok and Cerca are still true salina's with strongly fluctuating water levels that vary between hypersaline and brackish. Both have growth of Buttonwood trees on various locations at their borders, which form nesting habitat for Great egrets and other water bird species.

### 4.2 - What wetland type(s) are in the site?

#### Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Saline, brackish or alkaline water > Marshes & pools >> Sp: Permanent saline/brackish/alkaline marshes/pools		2		Unique
Saline, brackish or alkaline water > Marshes & pools >> Ss: Seasonal/intermittent saline/brackish/alkaline marshes/pools	salina	1		

#### Human-made wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type
8: Wastewater treatment areas		3	4
9: Canals and drainage channels or ditches		0	

#### Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known
Mixed desert scrub	16.77
Buildings	0.5

#### (ECD) Habitat connectivity

Bubali and Palm Beach are connected by culverts. Bubali has a connection via a channel and a sluice with the Caribbean sea. Cerca and Malmok are also connected by culverts. Druif is more or less isolated from the others.

## 4.3 - Biological components

### 4.3.1 - Plant species

#### Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Bursera simaruba</i>	

#### Invasive alien plant species

Phylum	Scientific name	Impacts
TRACHEOPHYTALILIOPSIDA	<i>Eichhornia crassipes</i>	Actual (major impacts)

Optional text box to provide further information

The Common Water Hyacinth actually makes water areas inaccessible for certain bird species.

#### 4.3.2 - Animal species

Invasive alien animal species

Phylum	Scientific name	Impacts
CHORDATA/REPTILIA	<i>Boa constrictor</i>	Actual (major impacts)
CHORDATA/ACTINOPTERYGII	<i>Oreochromis mossambicus</i>	Actual (major impacts)
CHORDATA/REPTILIA	<i>Trachemys scripta elegans</i>	Actual (major impacts)

### 4.4 - Physical components

#### 4.4.1 - Climate

Climatic region	Subregion
B: Dry climate	BWh: Subtropical desert (Low-latitude desert)

#### 4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres)

a) Maximum elevation above sea level (in metres)

- Entire river basin
- Upper part of river basin
- Middle part of river basin
- Lower part of river basin
- More than one river basin
- Not in river basin
- Coastal

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean.

Southern Caribbean Sea

#### 4.4.3 - Soil

- Mineral
- Organic
- No available information

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes  No

#### 4.4.4 - Water regime

Water permanence

Presence?	
Usually permanent water present	No change
Usually seasonal, ephemeral or intermittent water present	No change

Source of water that maintains character of the site

Presence?	Predominant water source	
Water inputs from surface water	<input checked="" type="checkbox"/>	No change
Water inputs from precipitation	<input checked="" type="checkbox"/>	No change

Water destination

Presence?	
Marine	No change
Feeds groundwater	No change

Stability of water regime

Presence?	
Water levels largely stable	No change
Water levels fluctuating (including tidal)	No change

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology:

The waste water treatment plant is the main source of water for Bubali, Palm Beach and Druif. Rain water is the main source of water for Cerca and Malmok. Evaporation is the main cause of water loss.

4.4.5 - Sediment regime

- Significant erosion of sediments occurs on the site
- Significant accretion or deposition of sediments occurs on the site
- Significant transportation of sediments occurs on or through the site
- Sediment regime is highly variable, either seasonally or inter-annually
- Sediment regime unknown

4.4.6 - Water pH

- Acid (pH<5.5)
- Circumneutral (pH: 5.5-7.4 )
- Alkaline (pH>7.4)
- Unknown

4.4.7 - Water salinity

- Fresh (<0.5 g/l)
- Mixohaline (brackish)/Mixosaline (0.5-30 g/l)
- Euhaline/Eusaline (30-40 g/l)
- Hyperhaline/Hypersaline (>40 g/l)
- Unknown

4.4.8 - Dissolved or suspended nutrients in water

- Eutrophic
- Mesotrophic
- Oligotrophic
- Dystrophic
- Unknown

Please provide further information on dissolved or suspended nutrients (optional):

Water from the waste water treatment plant can still be considered eutrophic. Malmok and Cerca are fed by rain water, which runs through residential areas and can be considered mesotrophic.

4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the i) broadly similar  ii) significantly different  site itself:

- Surrounding area has greater urbanisation or development
- Surrounding area has higher human population density
- Surrounding area has more intensive agricultural use
- Surrounding area has significantly different land cover or habitat types

Please describe other ways in which the surrounding area is different:

The surrounding area is largely urbanised as it is near touristic coastal areas and the outskirts of the capital Oranjestad.

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Hazard reduction	Flood control, flood storage	High

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Nature observation and nature-based tourism	High

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part	High

Other ecosystem service(s) not included above:

The site acts like a rain water catchment which reduces the flood risk of surrounding areas

Outside the site:

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes  No  Unknown

Where economic studies or assessments of economic valuation have been undertaken at the site, it would be helpful to provide information on where the results of such studies may be located (e.g. website links, citation of published literature):

Aruba's government has set itself a goal to move towards Sustainable Development, which in its essence means balancing out three interconnected spheres; social welfare, economic responsibility and ecological resilience. In order to make sound decisions about the management of ecosystems, it is necessary to estimate the socio-economic value that these ecosystems provide to Aruba and incorporate Natural Capital in policy-making. In February 2016, the Aruban Government therefore commissioned a TEEB study (The Economics of Ecosystems and Biodiversity) to research the importance of nature for economic and social prosperity of Aruba. This is an important step towards the development of a Sustainable Island Economy on Aruba. It was found that for ecosystem services related to tourism, culture, fishing and carbon, the value of Aruba's natural capital exceeded US\$ 287 million per year (Polaszek et al., 2018).

4.5.2 - Social and cultural values

- i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland
- ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland
- iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples
- iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland

<no data available>

4.6 - Ecological processes

(ECD) Notable aspects concerning migration	An important and crucial migratory stop-over location offering a broad range of habitats that is beneficial to a wide range of bird species
(ECD) Pressures and trends concerning any of the above, and/or concerning ecosystem integrity	Increased development elsewhere on Aruba, has seen the gradual decline of smaller wetland areas. Consequently, Bubali Wetlands remains the largest and most significant wetland of its type on Aruba.

## 5 - How is the Site managed? (Conservation and management)

### 5.1 - Land tenure and responsibilities (Managers)

#### 5.1.1 - Land tenure/ownership

##### Public ownership

Category	Within the Ramsar Site	In the surrounding area
Local authority, municipality, (sub)district, etc.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

##### Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Provide further information on the land tenure / ownership regime (optional):

The land is owned by the Public Entity of Aruba. Salina Druif is partly owned by the Tierra Del Sol golf course.

#### 5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

The site is managed by the Aruba National Park Foundation (FPNA - Fundacion Parke Nacional Aruba) but Bubali and Palm Beach is co-managed by the Public Works Department (DOW - Dienst Openbare Werken). DOW for instance decides about opening of sluices between Bubali/Palm Beach and between Bubali and the Caribbean Sea. Also DOW helps with the removal of the invasive water hyacinth. DOW also decides on the amount of effluent flowing from the waste water treatment towards Druif.

Provide the name and/or title of the person or people with responsibility for the wetland:

FPNA - Tyson Lopez (CEO) and Natasha Silva Chief Conservation Officer

Postal address:

FPNA - Fundacion Parke Nacional Aruba  
San Fuego 70  
Aruba  
DOW - Water Treatment Plant Bubali  
Sabana Blanco 68  
P.O. Box 411, Oranjestad  
Aruba

E-mail address:

info@arubanationalpark.org

## 5.2 - Ecological character threats and responses (Management)

### 5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

#### Human settlements (non agricultural)

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Housing and urban areas	High impact	High impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Tourism and recreation areas	High impact	High impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### Human intrusions and disturbance

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Recreational and tourism activities	Medium impact	High impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

#### Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Invasive non-native/ alien species	High impact	High impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

#### Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Household sewage, urban waste water	High impact	High impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Excess heat, sound, light	High impact	High impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Droughts	Low impact	High impact	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Temperature extremes	Medium impact	High impact	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Storms and flooding	Low impact	Low impact	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### 5.2.2 - Legal conservation status

#### National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Identified by Aruba parliament as protected area and part of Aruba National Park	Bubali Wetlands		whole

#### Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Bubali Wetlands	<a href="http://datazone.birdlife.org/site/factsheet/20856">http://datazone.birdlife.org/site/factsheet/20856</a>	whole
Important Bird Area	Tierra Del Sol	<a href="http://datazone.birdlife.org/site/factsheet/tierra-del-sol-salin-a-iba-aruba-(to-netherlands)">http://datazone.birdlife.org/site/factsheet/tierra-del-sol-salin-a-iba-aruba-(to-netherlands)</a>	whole
Other non-statutory designation	KBA Bubali Wetlands	<a href="http://www.keybiodiversityareas.org/site/factsheet/20856">http://www.keybiodiversityareas.org/site/factsheet/20856</a>	whole
Other non-statutory designation	KBA Tierra Del Sol	<a href="https://www.keybiodiversityareas.org/site/factsheet/20855">https://www.keybiodiversityareas.org/site/factsheet/20855</a>	whole

### 5.2.3 - IUCN protected areas categories (2008)

- Ia Strict Nature Reserve
- Ib Wilderness Area: protected area managed mainly for wilderness protection
- II National Park: protected area managed mainly for ecosystem protection and recreation
- III Natural Monument: protected area managed mainly for conservation of specific natural features
- IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention
- V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation
- VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

### 5.2.4 - Key conservation measures

#### Legal protection

Measures	Status
Legal protection	Implemented

#### Habitat

Measures	Status
Improvement of water quality	Proposed
Habitat manipulation/enhancement	Proposed

#### Species

Measures	Status
Control of invasive alien plants	Partially implemented
Control of invasive alien animals	Proposed

#### Human Activities

Measures	Status
Regulation/management of recreational activities	Proposed
Communication, education, and participation and awareness activities	Partially implemented
Research	Partially implemented

### 5.2.5 - Management planning

Is there a site-specific management plan for the site? In preparation

Has a management effectiveness assessment been undertaken for the site? Yes  No

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes  No

Please indicate if a Ramsar centre, other educational or visitor facility, or an educational or visitor programme is associated with the site:

A watch tower for the observation of birds is available in the north of the site. The management authority FPNA has a visitor centre at the entrance of the Aruba National Park (also known as Arikok National Park), which is some 13 km straight from the Bubali Wetlands.

### 5.2.6 - Planning for restoration

Is there a site-specific restoration plan? No, but restoration is needed

Further information

Restoration measures concern the management and control of invasive species among others.

### 5.2.7 - Monitoring implemented or proposed

<no data available>

## 6 - Additional material

### 6.1 - Additional reports and documents

#### 6.1.1 - Bibliographical references

The Dutch Caribbean Biodiversity Database ([www.dcbd.nl](http://www.dcbd.nl)) provides the most complete overview of data, maps and documents on the Dutch Caribbean Islands, among which the Bubali Wetlands.

References used for this RIS:

BirdLife International, 2008. Important Bird Areas in the Caribbean: Key sites for Conservation. Cambridge, UK: BirdLife International. (BirdLife Conservation Series No. 15).

Lue, Naviel, Geerman, Yahaira, Boekhoudt, Gisbert & Robert Kock, 2018. Natuur en Milieu in het ROP. Natuurwaarden en milieubeheer aandachtsgebieden voor het vernieuwde Ruimtelijke Ontwikkelingsplan. Directie Natuur en Milieu, Aruba. 40p.

Polaszek, Timothy, Lacle, Francielle, Beukering, Pieter van, and Esther Wolfs, 2018. The Economics of Ecosystems and Biodiversity, Aruba January 2018 Updated version. 129p.

Quick, John, S., Reinert, Howard K., de Cuba, Eric R. and R. Andrew Odum, 2005. Recent Occurrence and Dietary Habits of Boa constrictor on Aruba, Dutch West Indies. Journal of Herpetology. Vol. 39, No. 2: pp. 304-307.

Peterson, Gregory M. and Annette H. Peterson-Bredie, 2016. Bird Wildlife of Aruba. Aruba Birdlife Conservation. 431p.

Van Halewijn, R., Higler, L.W.G. & A.L. Spaans, 1992. Ecologisch onderzoek Bubali-plas, Aruba RIN-rapport 92/30 : 145p.

Wetlands International. Waterbird Population Estimate 5 (WPE5). <http://wpe.wetlands.org>

#### 6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)

<no file available>

ii. a detailed Ecological Character Description (ECD) (in a national format)

<no file available>

iii. a description of the site in a national or regional wetland inventory

<no file available>

iv. relevant Article 3.2 reports

<no file available>

v. site management plan

<no file available>

















vi. other published literature

<no file available>

<no data available>

#### 6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:

	Information panel near the canal that connects Bubali Wetlands with the Caribbean Sea in the southwest of the site. The invasive water hyacinth can be seen in the background. ( <i>René Henkens, 13-11-2019</i> )		The Bubali Wetlands are an oasis between urban areas and high rise hotels. ( <i>René Henkens, 13-11-2019</i> )		Juvenile Little Blue Heron at Bubali Wetlands (Egretta caerulea). ( <i>René Henkens, 13-11-2019</i> )		Black Skimmers ( <i>Greg Peterson, 07-03-2019</i> )
	Shorebirds ( <i>Greg Peterson, 04-12-2019</i> )		Roseate Spoonbill (Platalea ajaja) ( <i>Greg Peterson, 03-05-2021</i> )		Great White Egrets (Ardea alba) ( <i>Greg Peterson, 23-02-2020</i> )		Whimbrels (Numenius phaeopus) ( <i>Greg Peterson, 07-03-2019</i> )
	White Checked Pintails (Anas bahamensis) ( <i>Greg Peterson, 30-10-2019</i> )		The Bubali Wetlands are an oasis between urban areas and high rise hotels. ( <i>FPNA, 12-10-2022</i> )		Salina Cerca ( <i>FPNA, 29-06-2023</i> )		Salina Cerca ( <i>FPNA, 29-06-2023</i> )
	Salina Druif ( <i>FPNA, 29-06-2023</i> )		Salina Malmok ( <i>FPNA, 29-06-2023</i> )		Salina Malmok ( <i>FPNA, 29-06-2023</i> )		Salina Palm Beach ( <i>FPNA, 13-07-2021</i> )

#### 6.1.4 - Designation letter and related data

Designation letter

<1 file(s) uploaded>

Date of Designation