Ramsar Information Sheet

Published on 10 July 2017

Brazil

Guaraqueçaba Ecological Station

Designation date	5 June 2017
Site number	2305
Coordinates	25°17'09"S 48°22'18"W
Area	4 370,00 ha

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 Guaraqueçaba Ecological Station consists of three mangroves areas inside the continent and six islands at the Pinheiros Bay, Laranjeiras Bay, and Guaraqueçaba Bay and Benito's Inlet. This Protected Area has a large diversity of endemic, migratory and endangered species (Brasil, 2000). There are no human inhabitants within the boundaries of this Ecological Station.
The Guaraqueçaba Ecological Station surroundings is protected by another area called Guaraqueçaba Environmental Protection Area (Guaraqueçaba EPA), and it is located near the Superagui National Park, the Sebuí Private Reserve of Natural Heritage (PRNH) and the Private Reserve of Natural Heritage Serra do Itaqui (PRNH). It is part of the 40 protected areas (coastal, marine and land) of the Lagamar Mosaic, located on the southern coast of São Paulo and Paraná´s entire coast, and is under several management categories.
It integrates the Atlantic Forest South-East Biosphere Reserve and the region was headed by UNESCO as World Natural Heritage Site of Humanity (Southeast Atlantic code 893-003), in 1991 and 1999. Some characteristics of the region:

- It`s an outstanding example representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems, and communities of plants and animals, such as Atlantic forest and mangroves;

- Contains the most important natural and significant habitats for biodiversity conservation in-situ in the costal of Paraná State, including those containing a threatened and endemic specie such as Amazona brasiliensis – Red-tailed Amazona threatened species VU for IUCN Red List, 2016.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Compiler 1

Name: Marília Cunha Lignon

Institution/agency: Consultant

Postal address: Rua Armando de Oliveira Cobra, 260 /144
12246-002 São José dos Campos - SP

E-mail: cunha.lignon@gmail.com

Phone: +55 12 98168-1102

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

From year: 2014

To year: 2014

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish): Guaraqueçaba Ecological Station

2.2 - Site location

2.2.1 - Defining the Site boundaries

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

Former maps: 0

Boundaries description

There are 14 mangrove areas on the islands of Pinheiros, Laranjeiras, Rabelo, Pavoçá and Sambaqui, and the Bays of Pinheiros, Guaraqueçaba and Benito's Inlet (Brasil, 1982).

On the 31st July 1986 when Federal Decree No. 93,053 was enacted (Brasil, 1986), Bananas and Galheta Islands were incorporated into the Guaraqueçaba Ecological Station, increasing its area to 4475.69 hectares. Bananas Island, located on Laranjeiras Bay in the Guaraqueçaba municipality, is considered an area of great scenic beauty. Galheta Island (belonging to the Paranaguá municipality), with important rocky shores, and is located 3 km away from Pontal do Paraná, at the mouth of Paranaguá Bay close to Mel Island.

The Guaraqueçaba Ecological Station is part of the Guaraqueçaba Environmental Protection Area (Guaraqueçaba EPA), which is 282,444,02 hectares big.

2.2.2 - General location

a) In which large administrative region does the site lie? Paraná state

b) What is the nearest town or population centre? Guaraqueçaba city

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): 4370

Area, in hectares (ha) as calculated from GIS boundaries: 4370.08

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Udvardy's Biogeographical Provinces	Neotropical Region of Serra do Mar's Province

Other biogeographic regionalisation scheme

The Guaraqueçaba Ecological Station is part of the Atlantic Forest biome (Brasil, 2010), where a mangrove ecosystem dominates.

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 wetlands/mangroves are representative for the area of Paraná State and it is located in the costal marine biome.,at Benito bay (confluence with Tagaçaba and Serra Negra rivers) and Itaquibay (confluence of Pacotuva and Boquaçubay)and Ipanema, Guaraqueçaba, Poruquara, Birigui and Sabuí river mouth. These wetlands contribute to the reduction of the estuarine sedimentation in the area, they work as a pollution filter that absolved waste from rice and palms farms located at Tagacaba, Serra Negra and Guaraqueçaba river basin and help to stabilize the coastline and prevents erosion from waves and storms. The mangrove forests located at the site are extremely productive ecosystems (IPARDES,1995).
Other ecosystem services provided	The Guaraqueçaba Ecological Station presents an important area of mangroves, vegetation that lives in saline water and is important for fish reproduction, feeding area, nursery and refugee for fish, mollusks, aquatic fauna, it represents a stock of carbon and contributes to the regulation of the ecosystem and climatic and hydric regimes and protection of the coastal area.There are 14 mangrove areas on the islands of Pinheiros, Laranjeiras,Rabelo,Pavoçá and Sambaqui, and the Bays of Pinheiros, Guaraqueçaba and Benito's Inlet (Brasil, 1982).
Other reasons	Estuaries, mangroves, rivers, channels, coastal plains, waterfalls, forests, marine and coastal islands are a collection of rich landscapes in this highly diverse wetlands area. It also has rare scenic beauty, threatened and endemic species, among other characteristics and it is a high productive ecosystem at Paraná State, Guaraqueçaba bay. The Atlantic Forest biome, which occupies 13% of the Brazilian territory, has associated coastal ecosystems, including a mangrove ecosystem (Brasil, 2010), which dominates the landscape of the Ramsar Site. The vegetation in the region is within the Atlantic Forest domain and includes variations of the Dense Ombrophilous Forest (Montane, Sub-Montane, Lowlands and Alluvial) and different types of pioneer formations (fluvial, fluvial-marine and marine influences) (Antunes, 1996, Kauanoet al., 2012).

☑ Criterion 2 : Rare species and threatened ecological communities

☑ Criterion 3 : Biological diversity

Justification	The Guaraqueçaba Ecological Station hosts 4475.69 hectares of conserved mangroves in the bays of Pinheiros and Guaraqueçaba, and Benito's Inlet (Brasil, 1982). Typical species of mangrove plants in the region include the red mangrove (Rhizophora mangle), the white mangrove (Laguncularia racemosa) and the black mangrove (Avicennia schaueriana). The presences of mangroves in the region (with a good conservation status) provide shelter and food for numerous bird species, marine and freshwater fish, as well as crustaceans and molluscs, making the region extremely important in terms of biodiversity and fish production. In the Paranaguá Estuarine-Lagoon Complex where the Ramsar Site is located, the great diversity of ichtyofauna consists of Brazilian tropical coast species, as well as species known from the temperate zones of Argentina and Uruguay. This fact highlights the region's importance for regional and global biodiversity conservation (Passos et al., 2012). The Guaraqueçaba Ecological Station mangroves are in a good state of conservation and have few anthropomorphic pressures. A great diversity of birds uses the mangroves to feed, including 13 birds regional migratory species and four others that migrate from the Northern Hemisphere (Mestre et al., 2007).

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

☑ Criterion 8 : Fish spawning grounds, etc.

Justification

The mangrove associated fauna can be grouped into four functional classes (Aveline, 1980): (1) species that are directly associated with the mangrove trees' aerial structure, for example, the mangrove oyster (Crassostrea rhizophorae); (2) species that live in terrestrial habitats and periodically migrate to the mangrove, like reptiles and birds; (3) species that inhabit the mangrove sediments or adjacent muddy surfaces, such as the mangrove crab (Ucides cordatus) and the mangrove mussel (Mytella guyanensis); (4) species that live in the marine environment but spend part of their life cycle in the mangroves, for example, the prawns Penaeus brasiliensis and Penaeus schimittii and some fish, such as the mullet (Mugil spp) and anchovy (Engraulidae). All these species are found in the Guaraqueçaba Ecological Station's mangroves.
Regarding the demersal ichtyofauna that occur at the bottom estuary, the Ariidae, Sciaenidae, Paralichthyidae and Tetraodontidae families dominate both in frequency and weight in Guaraqueçaba's Bay. Species of catfish (Cathorops spixii, Genidens genidens and Sciadeichthys luniscutis) are also dominant in the region. Their reproductive activities were observed in the species C. spixii, S. rastrifer, S. testudineus, Isopisthus parvipinnis, G. genidens and S. Luniscutis (Corrêa, 2001), reinforcing the importance of the Guaraqueçaba Ecological Station to the maintenance of the local ichtyofauna.

The Guaraqueçaba Ecological Station's conserved mangroves provide nurseries and shelter for many species of commercial interest and local artisanal fisheries. In general, the coast of Paraná (that includes estuaries, bays and shallow continental shelf) is an important feeding and development area for juvenile and sub-adult marine turtles. Juvenile green turtles (C. mydas), and sub-adult and adult loggerhead turtles (C. caretta) are the most common user of the region (Domit, 2014).

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

Scientific name	Common name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
Avicennia schaueriana		☐	☑	☐	LC	☐		Typical species of mangrove plants in the region
Laguncularia racemosa		☐	☑	☐	LC	☐		Typical species of mangrove plants in the region
Rhizophora mangle		☐	☑	☐	LC	☐		Typical species of mangrove plants in the region

The Guaraqueçaba Ecological Station hosts 4370,15hectares of conserved mangroves in the bays of Pinheiros and Guaraqueçaba, and Benito's Inlet (Brasil, 1982). Typical species of mangrove plants in the region include the red mangrove (Rhizophora mangle), the white mangrove (Laguncularia racemosa) and the black mangrove (Avicennia schaueriana). The presences of mangroves in the region (with a good conservation status) provide shelter and food for numerous bird species, marine and freshwater fish, as well as crustaceans and molluscs, making the region extremely important in terms of biodiversity and fish production.
There are also coastal ecosystems such as rock shore and sand bank and the species such as:Typha domingensis, Hedyahium coronarium, Hibiscus tiliaceus, Dalbergia Hecastophylla and Spartina Sp.

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

Phylum	Scientific name	Common 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								
Birds																		
CHORDATA/ AVES	*Actitis macularius*		☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Neartic migratory species
CHORDATA/ AVES	*Amazona brasiliensis*	Red-tailed Amazon	☑	☐	☐	☐	☐	☐	☐	☐				VU	☑	☐	endangered at the Paraná State	
CHORDATA/ AVES	*Anas bahamensis*	White-cheeked Pintail	☐	☑	☐	☐	☐	☐	☐	☐				LC	☐	☐		species that moves locally for reproduction
CHORDATA/ AVES	*Cairina moschata*	Muscovy Duck	☐	☑	☐	☐	☐	☐	☐	☐				LC	☐	☐		species that moves locally for reproduction
CHORDATA/ AVES	*Camptostoma obsoletum*	Southern Beardless Tyrannulet; Southern Beardless-Tyrannulet	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Species that migrate regionally or intertropics
CHORDATA/ AVES	*Chaetura meridionalis*	Sick's Swift; Ashy-tailed Swift	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Species that migrate regionally or intertropics
CHORDATA/ AVES	*Charadrius semipalmatus*	Semipalmated Plover	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Neartic migratory species
CHORDATA/ AVES	*Chordeiles acutipennis*	Lesser Nighthawk	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Species that migrate regionally or intertropics
CHORDATA/ AVES	*Eudocimus ruber*	Scarlet Ibis	☑	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐	critically endangered at the Paraná State	Endemic species
CHORDATA/ AVES	*Molothrus bonariensis*	Shiny Cowbird	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Species that migrate regionally or intertropics
CHORDATA/ AVES	*Notiochelidon cyanoleuca*	Blue-and-white Swallow	☐	☐	☐	☐	☑	☐	☐	☐					☐	☐		Species that migrate regionally or intertropics
CHORDATA/ AVES	*Progne chalybea*	Grey-breasted Martin; Gray-breasted Martin	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Species that migrate regionally or intertropics
CHORDATA/ AVES	*Rynchops niger*	Black Skimmer	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Species that migrate regionally or intertropics
CHORDATA/ AVES	*Tangara peruviana*	Black-backed Tanager	☑	☐	☐	☐	☐	☐	☐	☐				VU	☐	☐	vulnerable in Brazil	
CHORDATA/ AVES	*Tapera naevia*	Striped Cuckoo	☐	☑	☐	☐	☐	☐	☐	☐				LC	☐	☐		species that moves locally for reproduction
CHORDATA/ AVES	*Tringa flavipes*	Lesser Yellowlegs	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Neartic migratory species
CHORDATA/ AVES	*Tringa melanoleuca*	Greater Yellowlegs	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Neartic migratory species
CHORDATA/ AVES	*Turdus amaurochalinus*	Creamy-bellied Thrush	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Species that migrate regionally or intertropics
CHORDATA/ AVES	*Turdus rufiventris*	Rufous-bellied Thrush	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Species that migrate regionally or intertropics

Phylum	Scientific name	Common 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	*Tyrannus melancholicus*	Tropical Kingbird	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Species that migrate regionally or intertropics
CHORDATA/ AVES	*Vanellus chilensis*	Southern Lapwing	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		Species that migrate regionally or intertropics
Fish, Mollusc and Crustacea																		
CHORDATA/ ACTINOPTERYGII	*Epinephelus itajara*	Atlantic goliath grouper	☑	☑	☐	☐	☐	☐	☐	☐				CR	☐	☐	vulnerable at the Paraná State, and critically endangered in Brazil	uses the Guaraqueçaba Ecological Station mangroves as a nursery
CHORDATA/ ACTINOPTERYGII	*Genidens barbus*	White sea catfish	☑	☐	☐	☐	☐	☐	☐	☐					☐	☐	endangered in Brazil	overexploited
CHORDATA/ ACTINOPTERYGII	*Hippocampus reidi*	Longsnout seahorse	☑	☐	☐	☐	☐	☐	☐	☐					☐	☐	Vulnerable in Brazil	overexploited
CHORDATA/ ACTINOPTERYGII	*Hyporthodus nigritus*	Warsaw grouper	☑	☐	☐	☐	☐	☐	☐	☐				CR	☐	☐	endangered in Brazil	
CHORDATA/ ACTINOPTERYGII	*Lutjanus analis*	Mutton snapper	☑	☐	☐	☐	☐	☐	☐	☐				VU	☐	☐		Overexploited
CHORDATA/ ACTINOPTERYGII	*Macrodon atricauda*	King weakfish	☑	☐	☐	☐	☐	☐	☐	☐					☐	☐	Please indicate if is is endangered under a specific list or regulation in Brazil	Overexploited
CHORDATA/ ACTINOPTERYGII	*Micropogonias furnieri*	Whitemouth croaker	☑	☐	☐	☐	☐	☐	☐	☐				LC	☐	☐	Please indicate if is is endangered under a specific list or regulation in Brazil	overexploited
CHORDATA/ ACTINOPTERYGII	*Mugil liza*	Mullet	☑	☐	☐	☐	☐	☐	☐	☐					☐	☐	Please indicate if is is endangered under a specific list or regulation in Brazil	overexploited
CHORDATA/ ACTINOPTERYGII	*Mycteroperca bonaci*	Black grouper	☑	☐	☐	☐	☐	☐	☐	☐				NT	☐	☐	near vulnerable in Brazil	overexploited
CHORDATA/ ACTINOPTERYGII	*Pomatomus saltatrix*		☑	☐	☐	☐	☐	☐	☐	☐				VU	☐	☐		overexploited
CHORDATA/ ACTINOPTERYGII	*Sardinella brasiliensis*		☑	☐	☐	☐	☐	☐	☐	☐					☐	☐	Please indicate if is is endangered under a specific list or regulation in Brazil	overexploited
CHORDATA/ ACTINOPTERYGII	*Umbrina canosai*	Argentine croaker	☑	☐	☐	☐	☐	☐	☐	☐					☐	☐	Please indicate if is is endangered under a specific list or regulation in Brazil	overexploited
Others																		
CHORDATA/ REPTILIA	*Caretta caretta*		☑	☐	☐	☐	☐	☐	☐	☐				VU	☑	☑	endangered in Brazil	
CHORDATA/ REPTILIA	*Chelonia mydas*	Green turtle	☑	☑	☐	☐	☐	☐	☐	☐				EN	☑	☑	vulnerable in Brazil	feed
CHORDATA/ REPTILIA	*Dermochelys coriacea*	Leatherback turtle	☑	☐	☐	☐	☐	☐	☐	☐				VU	☑	☑	critically endangered in Brazil	
CHORDATA/ REPTILIA	*Eretmochelys imbricata*	Hawksbill turtle	☑	☐	☐	☐	☐	☐	☐	☐				CR	☑	☑	critically endangered in Brazil	
CHORDATA/ REPTILIA	*Lepidochelys olivacea*	Olive ridley turtle	☑	☐	☐	☐	☐	☐	☐	☐				VU	☑	☑	endangered	

Phylum	Scientific name	Common 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/ MAMMALIA	*Pontoporia blainvillei*	Franciscana dolphins	☑	☐	☐	☐	☐	☐	☐	☐				VU	☐	☑	Endangered at the Paraná State, and critically endangered in Brazil	
CHORDATA/ MAMMALIA	*Sotalia guianensis*	Guiana dolphins	☑	☐	☐	☐	☐	☐	☐	☐					☑	☐	vulnerable for both the Paraná State and the Brazil	

1) Percentage of the total biogeographic population at the site

At the Paranaguá Estuarine-Lagoon Complex where the Ramsar Site is located, the great diversity of ichtyofauna consists of Brazilian tropical coast species, as well as species known from the temperate zones of Argentina and Uruguay. This fact highlights the region's importance for regional and global biodiversity conservation (Passos 2012).
Among the ichthyofauna of the Paranaguá Estuarine-Lagoon Complex, the Atlantic goliath grouper (Epinephelus itajara) is vulnerable at the Paraná State, and critically endangered in Brazil. The Warsaw grouper (Hyporthodus nigritus) is considered endangered in Brazil (IUCN, 2012). The black grouper (Mycteroperca bonaci) is considered to be near vulnerable in Brazil, and the mutton snapper (Lutjanus analis) is considered vulnerable (IUCN, 2012). Eleven species are considered overexploited (Brasil, 2004; 2008): the Brazilian sardinella (Sardinella brasiliensis), the white sea catfish (Genidens barbus), the longsnout seahorse (Hippocampus reidi), the Atlantic goliath grouper (Epinephelus itajara), the black grouper (Mycteroperca bonaci), the bluefish (Pomatomussaltatrix), the mutton snapper (Lutjanus analis), the king weakfish (Macrodon atricauda), the whitemouth croaker (Micropogonias furnieri), the Argentine croaker (Umbrina canosai) and the mullet (Mugil liza)) (Passos ,2012).

The Guaraqueçaba Ecological Station region is home to several species of endemic birds, such as the the red-tailed parrot (Amazona brasiliensis), endangered at the Paraná State, and black-backed tanager (Tangara peruviana), vulnerable in Brazil (Table 3.3), according to IUCN (2012).
In the Paraná coastal region (including estuaries, bays and a shallow continental shelf), there are records of sea turtles' species (Montanini e Domit, 2014). The green turtle (C. mydas) is considered vulnerable in Brazil, while the loggerhead turtle (C. caretta) is considered endangered in Brazil. Both the leatherback turtle (D. coriacea) and the hawksbill turtle (E. imbricata) are critically endangered in Brazil. There is insufficient data for the status of species at the Paraná State. In the Guaraqueçaba Ecological Station, individual green turtles are dominant (Sanches, 1999, Rosa, 2009, Montanini e Domit, 2014).

The estuary that bathes the Ramsar Site, hosts groups of Guiana dolphins (Sotalia guianensis) and Franciscana dolphins (Pontoporia blainvillei). According to IUCN (2012), the Franciscana dolphin is considered endangered at the Paraná State, and critically endangered in Brazil. The Guiana dolphin is considered vulnerable for both the Paraná State and the country as a whole (Zerbini et al, 1999).

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

Name of ecological community	Community qualifies under Criterion 2?	Description	Justification
Paranaguá Estuarine-Lagoon Complex	☐	Hosts mangroves that provide shelter and food for numerous bird species, marine and freshwater fish, as well as crustaceans and molluscs, making the region extremely important in terms of biodiversity and fish production.	The mangroves are in a good state of conservation and have few anthropomorphic pressures. A great diversity of birds uses the mangroves to feed, including regional migratory species and others that migrate from the Northern Hemisphere.

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

4.1 - Ecological character

The main ecosystems in the Site area mangroves, sandbanks and salt flats. The mangrove protected shoreline from storms, waves and floods, and prevent erosion by stabilizing sediments with their tangled roots system. They maintain water quality and clarity, filtering pollutants and trapping sediments originating from land. These habits offer a rich source of food while also offering refuge from predation.
These areas are important for different species of birds, including migratory birds, fish and invertebrates, such as oysters and crabs. The estuary produces nutrients, shelter and is a nursery for fish and invertebrates.

The ecological services from mangrove in the region are: high productivity of fish for 29 fishermen communities that lives at Paranagua Bay; maintenance of the marine fish stock that uses the estuary as a nursery and contribute for the industrial fisheries in the region, shelter for migratory birds and marine mammals.

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

Marine or coastal wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
F: Estuarine waters		2		
I: Intertidal forested wetlands		1	4475.69	Representative

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Scientific name	Common name	Position in range / endemism / other
Hedychium coronarium		
Spartina alterniflora		
Typha domingensis		

Invasive alien plant species

Scientific name	Common name	Impacts
Bactris gasipaes	pupunha	Potentially

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Common name	Pop. size	Period of pop. est.	%occurrence	Position in range /endemism/other
CHORDATA/AVES	Ardea cocoi	Cocoi Heron				
CHORDATA/AVES	Attila rufus	Grey-hooded Attila				
CHORDATA/AVES	Butorides striata					
CHORDATA/AVES	Chloroceryle amazona	Amazon Kingfisher				
CHORDATA/AVES	Cyanocorax caeruleus	Azure Jay				
CHORDATA/AVES	Egretta caerulea					
CHORDATA/AVES	Egretta thula	Snowy Egret				
CHORDATA/AVES	Fregata magnificens	Magnificent Frigatebird				
CHORDATA/AVES	Nycticorax nycticorax	Black-crowned Night Heron;Black-crowned Night-Heron				
CHORDATA/AVES	Phalacrocorax brasilianus	Neotropic Cormorant				
CHORDATA/AVES	Platalea ajaja	Roseate Spoonbill				
CHORDATA/AVES	Ramphocelus bresilius	Brazilian Tanager				
CHORDATA/AVES	Sula leucogaster	Brown Booby				
MOLLUSCA/BIVALVIA	Crassostrea brasiliana					
MOLLUSCA/BIVALVIA	Crassostrea rhizophorae					
MOLLUSCA/BIVALVIA	Mytella guyanensis					
ARTHROPODA/MALACOSTRACA	Ucides cordatus					

Invasive alien animal species

Phylum	Scientific name	Common name	Impacts
CHORDATA/ACTINOPTERYGII	Opsanus beta		Potentially
CHORDATA/ACTINOPTERYGII	Oreochromis mossambicus		Potentially

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
C: Moist Mid-Latitude climate with mild winters	Cfa: Humid subtropical (Mld with no dry season, hot summer)

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres): 0

a) Maximum elevation above sea level (in metres): 80

- 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.

Rivers: Tagaçaba, Serra Negra, Guaraqueçaba and Itaqui.
Atlantic ocean.

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

Source of water that maintains character of the site

Presence?	Predominant water source
Marine water	☐

Water destination

Presence?
Marine

Stability of water regime

Presence?
Water levels fluctuating (including tidal)

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

The water regime receives influenced from rivers and ocean waters. There is also the rain water of 3000 mm per year in the Site. The mangrove waters are saline and the salinity level varies from 0,5% to 3.0%."

(ECD) Stratification and mixing regime	The mixing regime form the area is based on rains, phases of the moon, direction and intensity of winds. When there is much rain in the rivers of the watersheds, high tides and east winds, the water goes into the estuary.When there is no rain, in the wat

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 ☐

Please provide further information on sediment (optional):

Mangroves are critical to maintaining environmental quality in the Paranaguá Estuarine-Lagoon Complex and its surrounding areas.

There are no studies about the sediment in the area. Studies carried out near the site indicates that there is significant accretion of sediments in the mangroves when the basin are degraded or when the river's flow speed up by hydroelectric power plant. Upstream the Site there is different sources of sediments such as: rice farms, buffalo and pupunha palm, sand miners, roads, houses etc… Although this situation bathymetry made by Paranagua Port studies indicates that the deposition of sediments is higher in Antonina's Bay than in Laranjeiras' s Bay – the Site area, It can be inferred that there is a significant deposition of sediment on the site (Paula, 2010).

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 ☐

Please provide further information on salinity (optional):

The tides are semidiurnal, and circulation patterns and water stratification vary between seasons. Average water salinity in summer is between 12-29 PSU and between 20-34 PSU in the winter.

4.4.8 - Dissolved or suspended nutrients in water

Eutrophic ☐
Mesotrophic ☐
Oligotrophic ☐
Dystrophic ☐
Unknown ☑

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 site itself: i) broadly similar ○ ii) significantly different ◉

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:

Curitiba, the Paraná state capital, is located approximately 174 km.
The municipalities around the site are Paranaguá (140,469 inhabitants) and Pontal do Paraná, also called Pontal do Sul (20,920 inhabitants), and Guaraqueçaba (7,871 inhabitants) (IBGE, 2010).
In Paranaguá, industrial activities and the service sector dominate.
Banana plantation by small rural farmers is a major activity in the areas surrounding the site, and is usually located in drained wetlands or alluvial plains areas, as well as on hillside areas (with lower slopes at 45°). In the Guaraqueçaba municipality, mandioc plantation is the 2nd most important agricultural activity. Subsistence plantations of beans, corn, coffee and sugarcane are also common (IPARDES, 1995).
More recently, the peach palm plantation (Bactris gasipaes) activities are found near the Ecological Station.

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Food for humans	Sustenance for humans (e.g., fish, molluscs, grains)	Medium

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Climate regulation	Local climate regulation/buffering of change	not relevant for site
Hazard reduction	Coastal shoreline and river bank stabilization and storm protection	Medium

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	High

Supporting Services

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

Within the site: 100s
Outside the site: 100000s

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):

Artisanal fishing is an important part of the Paraná's coastal economy. The coastal Paraná fishing communities (called caiçaras) are distributed in more than 60 rural villages and urban neighbourhoods within the bays and ocean front, and are diverse and heterogeneous. The communities living in the villages within the estuaries have extractive practices in mangrove forests, collecting oysters, crabs and clams (Andriguetto-Filho, 1999), and benefit from conserved Guaraqueçaba mangroves as a nursery and as a source of natural resources. This is also true for mangroves neighbouring the Guaraqueçaba Ecological Station and the estuary:
Andriguetto-Filho, J.M. 1999. Sistemas técnicos de pesca e suas dinâmicas de transformação no litoral do Paraná, Brasil. Tese de Doutorado, Curso de Pós-graduação em Meio Ambiente e Desenvolvimento. Universidade Federal do Paraná. 242 p.

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 ☑

Description if applicable

Artisanal fishing in the Guaraqueçaba Ecological Station region can be considered an important cultural value, being part of the caiçara way of life. The crab and oyster harvesting occurs within the Ecological Station and must be regulated. Mangrove mapping is being done by ICMBio, in order to organise these activities in the Protected Area and to legalise legitimate practices, since many caiçaras families depend directly on these natural resources, so they are an ally in the conservation of ecosystems.

ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland ☑

Description if applicable

Different archaelogical sites, such as shell middens, historic sites (with and without ruins) and tradição Itararé have been catalogued at the Guaraqueçaba Ecological Station and its surroundings (Blasi, 1987; Parellada & Neto, 1994; Brochier, 2004).
The shell middens (source term in Tupi: tamba = shells and ki = heap) are elevations where art objects have been deposited, and remain accommodated in coffins, but especially shells of oysters and fish leftovers consumed by human local communities (Calippo, 2004). Some of these remains were left by human local communities who inhabited the Brazilian coast for about 6,500 years BP (Gaspar, 2000). In Guaraqueçaba region, 50 and 78 shell middens were recorded, and further studies are needed to determine the exact number of archaeological sites in this region (Parellada, 1989). The shell middens of this Conservation Unit are rounded elevations, formed by calcareous material (Parellada, 1989), colonised by the Atlantic Forest and restinga vegetation, and are located near mangrove areas.
Historic archaeological sites are any sites with evidence of post-colonial processes (after 1,500 AD), and include remains from mestizo, Portuguese and African indigenous peoples, who settled on the coast of Paraná over different historical periods, forming towns and mills. In general, the cultural remains refer to objects and ceramic fragments, pipes, dishwashers, weight nets, metals and bones. Historical archaeological sites with ruins are associated with stone or brick buildings, usually in ruins.
The tradição Itararé refers to archaeological sites associated with pre-colonial indigenous groups (dating back to 1,000 years old), whose cultural remains include small fragments of ceramic pots, polished stones and burial sites. There is also evidence of agriculture and domestication of plants at these sites.

All human communities identified on archaeological sites on the Paraná coast exploited resources, such as fish, oysters and mussels. The large number of archaeological sites confirms the importance of mangroves and estuaries in the Guaraqueçaba Ecological Station as food providers for former human communities.

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 ☐

4.6 - Ecological processes

<no data available>

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
National/Federal government	☑	☐

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	☐	☑

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

The Ramsar site is state-owned and part of the public domain, according to law (Brasil, 2000). The vast majority of the Guaraqueçaba Ecological Station's areas are located in mangrove forests where there is no human occupation.
In the surrounding area, Curitiba city, is located approximately 174 km from the Guaraqueçaba Ecological Station. The municipalities around the Ecological Station are Paranaguá and Pontal do Paraná, also called Pontal do Sul, and Guaraqueçaba (IBGE, 2010).

5.1.2 - Management authority

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

Chico Mendes Institute for Biodiversity Conservation (Instituto Chico Mendes de Conservação da Biodiversidade). Regional nº 9 Florianópolis

Rod. Maurício Sirotsky Sobrinho, s/n° - km 02 – Jurerê Florianópolis/SC – 88053-700
55 (48) 3282 - 2617 / 2163

Provide the name and title of the person or people with responsibility for the wetland: Aroldo Correia da Fonseca, head of the Guaraqueçaba Ecological Station

Postal address: Rua Paula Miranda, 10
Postal Code 83390-000, Guaraqueçaba/PR

E-mail address: araoldo.fonseca@icmbio.gov.br

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
Commercial and industrial areas	High impact		☐	☑
Housing and urban areas	Medium impact		☐	☑

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Annual and perennial non-timber crops	unknown impact	unknown impact	☐	☑

Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Logging and wood harvesting	Medium impact		☑	☐

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Unspecified/others	unknown impact	unknown impact	☐	☑

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	unknown impact	unknown impact	☑	☑

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Household sewage, urban waste water	unknown impact	unknown impact	☐	☑

Please describe any other threats (optional):

In the Paranaguá Estuarine Complex, two species of exotic fish, the Gulf toadfish (Opsanus beta) from the North Atlantic and the Nile tilapia (Oreochromis niloticus) from Africa, have been recorded, and have had an impact on the local fauna and fishing. More studies on these invasive species' ecology are extremely important to the region (Passos et al., 2012), as there are no records of these alien species in the Guaraqueçaba Ecological Station. The presence of these species in the estuarine complex has a potential effect on the Ecological Station's mangrove fauna.
In the surrounding area, the Guaraqueçaba EPA region was considered to be a pristine area after analysing Laranjeiras Bay's sediments (Martins et al, 2010; Martins et al, 2011; Martins et al, 2012). It was found that mangrove areas, rivers and small bays were not contaminated, and that the sewage contribution is restricted to Paranaguá city's surrounding areas (Martins et al., 2011). In Paranaguá Bay, the nearest bay to the Paranaguá city, contamination was detected by sewage (Martins et al, 2010; Martins et al, 2011; Abreu-Mota et al, 2012) and organochlorine compounds (polychlorinated biphenyls - PCBs) (Combi et al., 2013).
Within the Paranaguá Estuarine Complex, the bays of Antonina and Paranaguá stand out as largest areas of urbanization, which include harbours, a Petrobras fuel terminal and two ports (Noernberg & Lana, 2002).
The strongest environmental impacts on the region are due to Paranaguá's port activities.
The expansion of peach palm plantations (Bactris gasipaes) has an important impact on the Guaraqueçaba Ecological Station's mangroves, since pesticides are used and deforestation for new areas occurs.

5.2.2 - Legal conservation status

Global legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
UNESCO Biosphere Reserve	Atlantic Forest South-East		partly
World Heritage site	Atlantic Forest South-East		partly

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Mosaic of protected areas	Lagamar Mosaic		partly
Protected area	Guaraqueçaba Environmental Protection Area		partly

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

Human Activities

Measures	Status
Fisheries management/regulation	Proposed

Other:

Some local fishing communities of the Guaraqueçaba Ecological Station's surrounding region rotate fishing activities among mangrove areas, so that the extraction does not harm the parental mangrove oyster bed's conservation (Miranda, 2004).
Periods of closure from harvesting activities for the mangrove crab, mangrove oyster and mangrove mussel were included in legal documents (IBAMA, 1996, 2002; SDP, 1987), and define the periods of the year where catching of such commercial species is prohibited (Miranda, 2004).
Mapping the Guaraqueçaba Ecological Station's mangrove is under development, and is being prepared jointly with local fishermen. Local fishermen are also included in activity planning and the adoption of more sustainable practices, which are accompanied by monitoring of impacts on natural ecosystems.

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:

The NGO Society for Wildlife Research and Environmental Education -SPVS had developed an education program for the Amazonas brazilienses - http://www.spvs.org.br/projetos/projeto-de-conservacao-do-papagaio-de-cara-roxa/

5.2.6 - Planning for restoration

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

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Animal species (please specify)	Implemented
Plant species	Proposed

The Society for Wildlife Research and Environmental Education (Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental - SPVS) works for the conservation of nature through natural areas protection, environmental education and the development of models for the sustainable use of natural resources. This non-governmental organisation has been conducting research in the Guaraqueçaba Ecological Station area and its surroundings since 1991. The conservation project for the red-tailed parrot (ongoing since 1998) focuses its research on the species' biology, population monitoring, management and environmental education. SPVS contributed to the development of the Guaraqueçaba EPA's integrated conservation plan.
Mapping the Guaraqueçaba Ecological Station's mangrove is under development, and is being prepared jointly with local fishermen. Local fishermen are also included in planning activities and the adoption of more sustainable practices, which are accompanied by monitoring of impacts on natural ecosystems.

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

see in 6.1.2 section

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)
<2 file(s) uploaded>

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>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:

http://www.icmbio.gov.br/portal/biodiversidade/unidades-de-conservacao/biomas-brasileiros/marinho/unidades-de-conservacao-marinho/2252-esec-de-guaraquecaba.html (*Geraldo Ottoni , 01-01-2014*)

6.1.4 - Designation letter and related data

Designation letter
<1 file(s) uploaded>

Date of Designation 2017-06-05