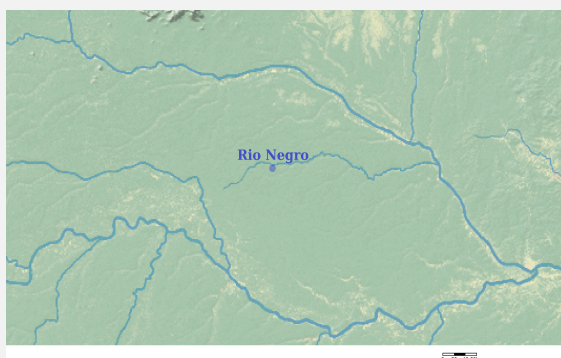




Ramsar Information Sheet

Brazil

Rio Negro



Designation date	19 March 2018
Site number	2335
Coordinates	01°43'44"S 64°05'19"W
Area	1 200 161 442,00 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

Among the main rivers in the Amazon Basin, the Rio Negro (Negro River) is the biggest tributary on the north margin of the Amazon. With over 1,500 km of extension, it is the longest black water river in the world (Idesam, 2017; Goulding et al., 2003). The region of influence of the Negro River comprises one of the largest areas of preserved tropical rainforests on the planet (Oliveira, 2001). The Negro River maintains high diversity (Goulding et al., 1988), associated with the Flood Pulse ecosystem dynamic (Junk et al., 1989). This spatial and temporal complexity makes the Negro basin comprise a high level of endemism of fish (Petry & Hales 2013; Nogueira et al., 2010) bird (Borges & Silva, 2012; Borges, 2007) and flora (Monteiro et al., 2014). The CUs main goal is to protect and manage a variety of wetlands that are peculiar to this region, such as Igapó forests (matas de Igapó), edaphic savannas (Campinas e Campinaranas), and fluvial archipelagos, along with the enormous ethno-cultural diversity comprised within the basin. Also, in the basin there are areas already declared as World Cultural Heritage Sites (2003), Biosphere Reserves (2001) (UNESCO, 2017a; 2017b) and Ramsar Sites (Anavilhanas, in 2017). Lastly, the Traditional Agriculture System of the Negro River has been declared a In In the Rio Negro region there are governance initiatives and management mechanisms in place, in a solid network comprising local, federal and international actors with an effective institutional articulation. The recognition of the region as a wetland of international importance is an opportunity for better integrated management of territories, in order to preserve the connectivity of ecological processes in wetlands. virtue of these characteristics, the Negro River Basin is considered of prominent relevance for National Cultural Heritage site, and there are several archeological sites found along the river (IPHAN, 2017a; 2017b).

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Compiler 1

Name	Leonardo Kleba Lisboa
Institution/agency	Ministério do Meio Ambiente – MMA (Environment Ministry of Brazilian Government)
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2.1.2 - Period of collection of data and information used to compile the RIS

From year	2017
To year	2017

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Rio Negro
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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	0
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Boundaries description

The limits of the site correspond to the limits of the protected areas and indigenous lands that conform it. In addition, the riparian forests of the Uneixi River, a tributary of the Negro river, link the Uneixi and Jurubaxi-Téa indigenous lands.

2.2.2 - General location

a) In which large administrative region does the site lie?	Federative Republic of Brazil, Amazonas State.
b) What is the nearest town or population centre?	Cities in the state of Amazonas: Manaus, Iranduba, Novo Airão, Barcelos, Santa Isabel do Rio Negro, São Gabriel da Cachoeira and Japurá (AM).

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):	1200161442
Area, in hectares (ha) as calculated from GIS boundaries	1200161442

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Udvardy's Biogeographical Provinces	Amazonian Biogeographic Province
WWF Terrestrial Ecoregions	Rio Negro Campinarana
WWF Terrestrial Ecoregions	Negro-Branco moist forest
WWF Terrestrial Ecoregions	Japurá-Solimões-Negro moist forests

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

The Amazon Forest provides a global environmental service of climate regulation that is fundamental to the stability of the planet (Capobianco, 2001). Besides retaining a hundred trillion of tons of carbon in organic material, the rivers that drain the Amazon basin are responsible for 20% of the global freshwater discharge to the oceans (MMA, 2002). The high precipitation rates in the Negro River basin, combined with the fact that it represents one of the most preserved regions in the Amazon, makes the Negro River of enormous relevance regarding the maintenance of global scale ecological services.

The Rio Negro is direct or indirectly a source of water supply for at least six Brazilian municipalities. The average demand of surface water withdrawal is estimated around 31,810 l/s, servicing 2 million people (ANA, 2017), with 98% of that population residing in the city of Manaus (Amazonas State). The city of Manaus itself is not within the borders of the site proposed here, but located on the mouth of the Negro River, next to the Amazon River, and would directly benefit from the establishment of a Ramsar site. As to the superficial water demand for the municipalities located within the proposed site, the direct utilization is a total of 110 l/s, supplying for 44 thousand inhabitants (ANA, 2017).

Hydrological services provided

The estimates provided here are for mechanized means of water withdrawal that are quantified and monitored by the Brazilian National Waters Agency (Agência Nacional de Águas – ANA). Therefore, these estimates do not capture the importance of the Rio Negro as water supply to the many indigenous peoples located mainly in the upper basin. The Brazilian portion of the high Rio Negro corresponds in its majority to six Indigenous Lands, totaling 10 million hectares, with an estimated population of 30 thousand people (Cabalzar, 2010).

Another service that is provided is the utilization of the main stem of the Rio Negro as a waterway, that represents the main connection between the city of Manaus and the municipalities of Barcelos, Santa Isabel do Rio Negro and São Gabriel da Cachoeira. It is the main non-aerial way of transportation within the region. The Rio Negro is navigable in Brazilian territory for an extension of 1,070 km (ANA, 2005).

The Protected Areas (PAs) included in the Site aim to consolidate a low impact sustainable management of resources performed by the local population, whether it is for traditional extractivism or agriculture. The traditional riverine populations and indigenous peoples are strongly linked to traditional extractivism practices that are sustained by the Rio Negro ecosystem services.

Among the most commercialized non-wood vegetable products, the most prominent are: Titica vine and caraná (vegetable fiber), the Brazil nut (seeds), White pitch (resin), Copaiba (oil), rubber trees (latex) and Açaí (fruit). Many of these species have Legal Normative Instructions with well determined criteria of good practices and extraction management (Idesam, 2016; Oliveira, 2001). Several other species have a register system for commercial use, such as the Arumã, Bacaba, Buriti, Bussú straw, Ambé vine, Jauari (*Astrocaryum jauari*: palm hearts), Seringa and Patauá.

The woody species with use and management registry are the Angelim, Cedrinho, Acariquara, Aritu, Baruri, Cupiúba, Carapanaúba, Dima, Envira de cotia, Itaúba, Jacareúba (*Calophyllum brasiliense*), Louro abacate, Louro preto, Mirapiranga, Sucupira babenta, vermelha (*Eschweilera* spp.) and Tento (Idesam, 2016; FVA, 2008).

Other ecosystem services provided

Many local families obtain their main protein needs by the consumption of local aquatic species, such as fish and chelonians. Most of the fish used as food source is captured through traditional fishing methods such as fish hooks and spear fishing. These techniques are not threatening to the natural fish stocks. The species frequently reported as captured by these methods are listed: Jaraqui (*Semaprochilodus* spp.), Peacock-bass (*Cichla* spp.), Pacu (*Myleus* spp.), Aracu (*Leporinus* spp.), Matrinchá (*Brycon* spp.), Cará (e.g. *Hoplarichus* spp.), Piranha (*Serrasalmus* spp.) and Trahira (*Hoplias* spp.). Species captured with a lower frequency are: South American silver croaker (*Plagioscion* spp.), Redtail catfish (*Phractocephalus hemiliopterus*), Pirarucu (*Arapaima gigas*), Aruanã (*Osteoglossum ferreirai*) and Kumakuma (*Brachyplatystoma filamentosum*) (FVA, 2008; Idesam, 2107). The aquatic chelonians constitute an important source of animal protein for the Amazon traditional populations. Both their meat and their eggs are widely consumed.

In the region, it is not rare to encounter hunting activities for subsistence, which is still of great importance for both indigenous and non-indigenous traditional communities. The main hunted animals in the region are the Spotted Paca (*Cuniculus paca*) and the Tapir (*Tapirus terrestris*). Other hunted animals are the Agouti (*Dasyprocta fuliginosa*), peccaries (*Tayassu* peccary, *Pecari tajacu*) and brocket deers (*Mazama americana*, *M. gouazoupira*) (Endo et al., 2010; FVA, 1998).

Other reasons

Due to their low nutrient concentration, acidic pH and high concentration of potentially toxic phenolic compounds, the black water basins are considered to have a fragile ecological equilibrium than the other basins in the Amazon region. In virtue of that, the many interactions between ecological groups that inhabit these ecosystems can be considered of extreme importance due to the highly adapted nature of these ecosystems (ISA, 2017). Among the highly adapted ecosystems in the Rio Negro basin, the most notable are the Igapó forests and the Campinas and Campinaranas.

The Igapó Forests are alluvial open ombrophilous forests. They consist of the woody vegetation located in the low areas near the black and clear water rivers of the Rio Negro basin. These forests are heavily influenced by the annual flooding cycles, determining an aquatic and dry season. These floodplains cover an area of approximately 118,000 km², representing 2% of the area of the Brazilian Amazon (Melack & Hess 2010). Since only a few species can tolerate the prolonged periods of inundation, these forests usually present low areal biomass, low diversity and a high degree of endemism, with species that are highly adapted to the local conditions (Ferreira, 1998, FVA, 2008).

The Campinas and Campinaranas are edaphic savannas that occur due to the nutrient poor white sand soils, unique to Northern Amazon. These savannas occur in depressions of tabular interfluvial areas or in floodplains, and show a variety of physiognomies ranging from open field areas to forest formations with thin trees. These areas are also characterized by highly endemic genus and species, such as the monotypic palm *Barcella odora*. Also, the Campinarana phyto-ecological region is in most part characterized by a neotropical endemic species of tree, the *Humiria balsamifera* var. *floribunda*, of the family Humiriaceae (IBGE, 2012).

The phyto-ecological formations considered as part of the Campinarana include a wide ranging mosaic of vegetation, including the Arborized Campinarana, that is restricted to the Rio Negro basin, specifically known as "chavascal" (FVA, 1998). There are other different occurring formations such as the Forested Campinarana (per se), the Arbustive Campinarana (Caatinga-gapó), and the Gramineous-Woody Campinarana (Campina) (Oliveira & Daly, 2001).

Furthermore, two large wetlands that deserve attention in the main stem of the Rio Negro are the Mariuá and the Anavilhanas archipelagos. These are considered the first and second biggest fluvial archipelagos in the world. The first extends for over 270 km and is composed of over 1,400 islands. The second stretches through 100 km along the main stem and comprises 400 islands (Oliveira, 2017). These archipelagos are covered predominantly by Igapó forests, which are inundated by the Rio Negro every year. They have a notable degree of diversification of tree species when compared to other fluvial islands in the region (Montero et al., 2014).

Criterion 2 : Rare species and threatened ecological communities

Criterion 3 : Biological diversity

A recent report produced by the WWF in partnership with the Mamirauá Institute sheds a light on the enormous undescribed diversity in the Amazon. In the years of 2014 and 2015, there was a new species described every two days (WWF, 2017). Accounting for the fact that the Negro river tributaries have not been adequately sampled in terms of ichthyofauna (FVA, 2008), and that new species inventories might alter significantly the amount of species in the Amazon region (Idesam, 2017), the region is of great relevance for maintaining both the current and future biodiversity on Earth.

Two characteristics of the Rio Negro region deserve to be highlighted: i) the high biodiversity in a region of extremely poor soils, with a great number of species that are restricted to the regions of Igapós and Campinaranas, and ii) the high diversity of trees in the interfluvial regions of the low Rio Negro, considered one of the highest ever reported worldwide (Oliveira, 2001). The diversity of species expected for the region presents low redundancy of species of the same genus, and low similarity to nearby patches. These characteristics are peculiar to the lower Ramsar site Rio Negro region due to the dispersion of species from several different regions of the Amazon Basin (Oliveira, 2001).

The aquatic vertebrate fauna found in the Negro river is also highly diverse. Within the area of the proposed site there are 4 species of caymans, at least 11 species of chelonians, two species of Amazon river dolphins (one being in the Brazilian list of threatened species), two species of freshwater otters (one listed by the IUCN) and the threatened Amazonian Manatee (Idesam, 2017; 2016; Ibama, 2016a; FVA, 1998). Estimates of number of fish species described for the entire basin vary from 750 (Alho et al., 2015) to 946 (Chao, 2001). It is highly likely that the main stem of the river is working as a connection for isolated populations of fish or refuge zone for several of these endemic species. However, the full list of endemic species of the Rio Negro has not been formulated yet.

Recent biogeographic analyses have indicated that there is an area of bird endemism (AOE) in Central Amazon, west of the lower course of the Rio Negro, named the Jaú AOE (Borges & Silva, 2012). The bird species inventory, concentrated only in the Jaú Park area, cataloged the presence of 445 species (FVA, 1998). As for the biodiversity that is maintained exclusively by Igapó Forests, in that park there were 194 species registered, with 58 not being found in other environments. Besides these forest-related species, 38 species are exclusive of aquatic environments, such as egrets, loons and ducks. Still, there are species of birds that are restricted to the temporarily flooded islands. For example, in the species inventory produced for the management plan of the Anavilhanas Park, of the 281 species of birds found, 97 were found exclusively in the flooded islands (Idesam, 2017).

Justification

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

Criterion 7 : Significant and representative fish

Due to its unique physical, chemical and biological characteristics, the Rio Negro basin present less favorable conditions to maintain fish stocks when compared to other Amazon regions. This results in a necessity to preserve these animals, which has been recognized in state decrees (Decreto nº 27.012/2007). In spite of the low biomass of its ichthyofauna, the Rio Negro basin has one of the biggest biodiversity of fish on the planet. These factors make large scale fishing unsustainable, while making these areas attractive for recreational and ornamental fishing (Redação Pesca Esportiva, 2016). Several of those species are endemic, and are present only in black water basins. The basin maintains over 90 species of endemic fish, including six monotypic genera: Tucanoichthys, Ptychocharax, Atopomesus, Leptobrycon, Niobichthys, and Stauroglanis (Petry & Hales, 2013).

In the Site there are fish species of interest than those that participate in migratory phenomena such as long-distance migrations. These are mainly represented by the large Amazonian catfish species such as the Kumakuma (*Brachyplatystoma filamentosum*), which is considered South America's biggest species of leather catfish, the Barred sorubim (*Pseudoplatystoma fasciatum*), and the Gilded catfish (*Brachyplatystoma rousseauxii*), which is considered detaining the world record for freshwater migration distance (11,600 km, Barthem et al., 2017). Other notorious migratory fish are characids, such as Brycon spp., and prochilodontidae such as the Semaprochilodus (Petry & Hales 2013). Within the area there are also unique assemblages of species in large leaf deposits, especially of small characids (Petry & Hales 2013).

Justification












Criterion 8 : Fish spawning grounds, etc.

Justification

Within the enormous area comprised within the Rio Negro Ramsar site, some regions are more auspicious for the reproduction and oviposition of fish. One of the main spawning grounds in the area are the archipelagos of fluvial islands present in the main stem of the Negro river. Specifically, as stated in the Anavilhanas National Park management plan, the archipelago holds several spawning grounds such as lakes, streams that drain the higher dry lands and the calm bottom water of lakes with abundance of submerged vegetation. Moreover, in the narrow channels that are formed between the islands, there have been reports of thousands of juvenile fish being flushed out during the annual flows caused by the dry season. This could indicate that several lowland species of the Amazon river use these islands as spawning grounds (Idesam, 2017; Goulding et al., 1988).

Aside from the fish spawning areas, the sandy beaches and Igapó forests present in the margins of the Rio Negro and also abundant in the fluvial archipelagos are important nesting areas for chelonians. Their life cycles and reproductive periods coincide with the river's cycles of flooding. The eggs are laid in a variety of places: vegetated areas, white sand beaches, beaches covered by shrubs and grasses. The two species that are more representative in the Rio Negro and that are threatened of extinction, Red-headed Amazon River Turtle (*Podocnemis erythrocephala*) and Big-headed Amazon River Turtle (*Peltocephalus dumerilianus*), have a preference for Campina areas and Igapó forests, respectively (Balestra, 2016). Their reproductive cycle starts at the end of the rainy season, when the beaches start appearing and they start laying eggs.

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





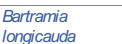
















Scientific name	Common name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
<i>Aldina latifolia</i> 		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		endemic
<i>Bertholletia excelsa</i> 		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	VU 	<input type="checkbox"/>		great economic value
<i>Coccoloba densifrons</i> 		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		endemic
<i>Eschweilera tenuifolia</i> 		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		adapted to flood periods
<i>Eugenia inundata</i> 		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		endemic
<i>Leopoldinia piassaba</i> 		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		endemic
<i>Mauritia carana</i> 		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		endemic
<i>Pachira insignis</i> 		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		endemic
<i>Symmeria paniculata</i> 		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		adapted to flood periods
<i>Unonopsis guatterioides</i> 		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		endemic

Aside from the species endemism already mentioned, there are genera that are restricted to the Rio Negro Campinarana regions. Among these are the *Asteranthos* (Lecythidaceae), of which the closest known species are in Africa, *Lorostemon* (Clusiaceae); *Aguiaria excelsa* (Bombacaceae), the biggest tree in the upper Rio Negro; and the *Piaçabarana* ("fake *piçaba*", *Barcella odora*), palm tree that forms enormous monospecific stands, but are restricted to only one area of the Rio Negro (Oliveira, 2001). Other palm trees that are restricted to the Rio Negro basin are the *Piaçaba* (*Leopoldinia piassaba*), the *Caraná* (*Mauritia carana*) and the *Mauritiella* (Oliveira, 2001; Henderson et al. 1995). The *Caraná* palm (*Mauritia carana*) is distributed along the northwest portion of the Amazon in Colombia, Venezuela and Brazil. It is found mainly in sandy soils drained by black water rivers. This palm is commonly found in the Campinaranas comprised in the proposed Ramsar Site.

The Brazil-nut tree (*Bertholletia excelsa*, *Castanheira*) is a species of great economic value, and is broadly distributed and frequent in the Brazilian Amazon. Although it is protected by law, the species suffers an enormous pressure from the collection of its seeds for industrial and feeding purposes, which already hampers the recruitment of new individuals. The species has been suffering continuous decline in habitat quality and extension due to the expansion of farming and grazing activities (CNCFlora, 2017). The tree species *Virola surinamensis* (*Ucuúba*), found in both the lower (PARNA Anavilhanas) and upper (Indigenous Lands) Rio Negro, is considered threatened both by the IUCN and the Brazilian red lists (CNCFlora, 2017). On the lower Rio Negro, this species has low abundance and also shows signs of alteration in its population structure due to overexploitation (Idesam, 2017).

Other endemic species of global importance are several species adapted to long flooding periods such as: *Aldina latifolia* (Macucu), *Eugenia inundata* (Araçazinho), *Pachira insignis* (Mungubarana), *Coccoloba pichuna* (Maracarana) and *Unonopsis guatterioides* (Envira-surucucu) (Idesam, 2017). Other species of interest, adapted to flood periods, are *Oryza glumaepatula*, *Symmeria paniculata*, *Eschweilera tenuifolia* on the lower flood zones. Also, *Tovomita* sp. and *Coccoloba pichuna* are species that occur mostly on very low land areas, and are resistant to 340 days of flooding during the year (Piedade, 2005).

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	 <i>Actitis macularius</i>	Spotted Sandpiper	<input checked="" 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"/>		migratory
CHORDATA/ AVES	 <i>Agamia agami</i>	Agami Heron	<input checked="" type="checkbox"/>	<input 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"/>		threatened
CHORDATA/ AVES	 <i>Bartramia longicauda</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>Calidris fuscicollis</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>Calidris melanotos</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>Calidris minutilla</i>	Least Sandpiper	<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>Harpia harpyja</i>		<input checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/ AVES	 <i>Hirundo rustica</i>	Barn Swallow	<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>Limosa haemastica</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>Morphnus guianensis</i>	Crested Eagle	<input checked="" type="checkbox"/>	<input 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"/>	VU in brazilian list	
CHORDATA/ AVES	 <i>Myrmoborus lugubris</i>	Ash-breasted Antbird	<input checked="" type="checkbox"/>	<input 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"/>		threatened

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	GITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
CHORDATA/AVES	<i>Nyctibius leucopterus</i>	White-winged Potoo	<input checked="" 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"/>	VU in brazilian list	
CHORDATA/AVES	<i>Pandion haliaetus</i>	Western Osprey, Osprey	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		migratory
CHORDATA/AVES	<i>Pluvialis dominica</i>	American Golden-Plover; American Golden Plover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		migratory
CHORDATA/AVES	<i>Progne subis</i>	Purple Martin	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		migratory
CHORDATA/AVES	<i>Thamnophilus nigrocinereus</i>	Blackish-grey Antshrike	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT 	<input type="checkbox"/>	<input type="checkbox"/>	CR in brazilian list	
CHORDATA/AVES	<i>Tigrisoma fasciatum</i>	Fasciated Tiger-Heron; Fasciated Tiger Heron	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>	VU in brazilian list	
CHORDATA/AVES	<i>Tringa flavipes</i>	Lesser Yellowlegs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		migratory
CHORDATA/AVES	<i>Tringa melanoleuca</i>	Greater Yellowlegs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		migratory
CHORDATA/AVES	<i>Tringa solitaria</i>	Solitary Sandpiper	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		migratory
CHORDATA/AVES	<i>Tyrannus savana</i>	Fork-tailed Flycatcher	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		migratory
Fish, Mollusc and Crustacea																		
CHORDATA/ACTINOPTERYGII	<i>Arapaima gigas</i>	Arapaima; Arapaima; Arapaima	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		overexploited (Cities)
CHORDATA/ACTINOPTERYGII	<i>Zungaro zungaro</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		overexploited (Cities)
Others																		
CHORDATA/MAMMALIA	<i>Ateles belzebuth</i>	White-bellied Spider Monkey, White-fronted Spider Monkey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN 	<input type="checkbox"/>	<input type="checkbox"/>		threatened
CHORDATA/MAMMALIA	<i>Atelocynus microtis</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT 	<input type="checkbox"/>	<input type="checkbox"/>	VU in brazilian list	
CHORDATA/MAMMALIA	<i>Inia geoffrensis</i>	Pink River Dolphin; Amazon River Dolphin	<input checked="" type="checkbox"/>	<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"/>	EN in brazilina list	
CHORDATA/MAMMALIA	<i>Lagothrix lagothricha</i>		<input checked="" type="checkbox"/>	<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"/>	VU in brazilian list	threatened
CHORDATA/MAMMALIA	<i>Leopardus wiedii</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	VU in brazilian list	
CHORDATA/MAMMALIA	<i>Myrmecophaga tridactyla</i>	Giant Anteater	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU 	<input type="checkbox"/>	<input type="checkbox"/>		threatened
CHORDATA/MAMMALIA	<i>Panthera onca</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	VU in brazilian list	

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/ REPTILIA	<i>Peltecephalus dumerilianus</i>		<input checked="" type="checkbox"/>	<input 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"/>		threatened
CHORDATA/ REPTILIA	<i>Podocnemis erythrocephala</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"/>				VU 	<input type="checkbox"/>	<input type="checkbox"/>		threatened
CHORDATA/ REPTILIA	<i>Podocnemis sextuberculata</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"/>				VU 	<input type="checkbox"/>	<input type="checkbox"/>		threatened
CHORDATA/ REPTILIA	<i>Podocnemis unifilis</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"/>				VU 	<input type="checkbox"/>	<input type="checkbox"/>		threatened
CHORDATA/ MAMMALIA	<i>Priodontes maximus</i>	Giant Armadillo	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU 	<input checked="" type="checkbox"/>	<input type="checkbox"/>		threatened
CHORDATA/ MAMMALIA	<i>Pteronura brasiliensis</i>	Giant Otter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN 	<input checked="" type="checkbox"/>	<input type="checkbox"/>		threatened
CHORDATA/ MAMMALIA	<i>Puma concolor</i>		<input checked="" 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"/>	VU in brazilian list	
CHORDATA/ MAMMALIA	<i>Saguinus bicolor</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN 	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/ MAMMALIA	<i>Saguinus niger</i>	Black Tamarin; Western Black-handed Tamarin	<input checked="" type="checkbox"/>	<input 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"/>		
CHORDATA/ MAMMALIA	<i>Speothos venaticus</i>	Bush Dog	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	VU in brazilian list	
CHORDATA/ MAMMALIA	<i>Tapirus terrestris</i>	Brazilian Tapir; South American Tapir	<input checked="" type="checkbox"/>	<input 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"/>		threatened
CHORDATA/ MAMMALIA	<i>Tayassu pecari</i>	white-lipped peccary	<input checked="" type="checkbox"/>	<input 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"/>		
CHORDATA/ MAMMALIA	<i>Trichechus inunguis</i>	Amazonian Manatee	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU 	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		threatened

1) Percentage of the total biogeographic population at the site

It is believed that the Amazonian Manatee (*Trichechus inunguis*) is the most hunted animal of the Brazilian fauna. Despite being protected by law, and classified as endangered in the Brazilian and IUCN lists, the species is hunted both for subsistence and commercial uses, which has serious impact in its population (Idesam, 2017). The species *Inia geoffrensis* (Pink River Dolphin) shows now “insufficient data” in the IUCN red list. However, the four previous editions of the list have presented it as “vulnerable”. In the Brazilian threatened species list it is considered endangered.

Three species of terrestrial vertebrates considered endangered by the IUCN are present in the area: *Pteronura brasiliensis* (Giant river otter), *Saguinus bicolor* (Brazilian Bare-faced Tamarin) and *Ateles belzebuth* (White-bellied Spider Monkey). All of these species are found in the lower Rio Negro basin, in protected areas between Barcelos and Manaus. Another primate that is classified as vulnerable is the common woolly monkey (*Lagothrix lagotricha*), with local extinctions already being reported in several areas of the Amazon. Although none of these species are considered in the category of “critically endangered” by the IUCN, in the Brazilian list of endangered species there are two: *Saguinus bicolor* and *Nyctibius leucopterus* (White-winged Potoo).

A total of 11 species that are not present in the IUCN Red List are classified as threatened under the Brazilian law. The jaguar (*Panthera onca*) and the puma (*Puma concolor*), which are broadly distributed in the Amazon, are classified as vulnerable in the Brazilian red list due to population declines, habitat fragmentation, poaching and retaliation killings due to cattle loss (Idesam, 2017).

The fish fauna in the area of the proposed Site contains at least 21 endemic species with reduced distribution within the Rio Negro Basin, mainly in the upper Rio Negro’s smaller tributaries (Nogueira et al., 2010; Buckup et al., 2007).

Regarding the chelonian species, in the aquatic environments of the Jaú park there were considerable observations of endangered species considered vulnerable (*Podocnemis erythrocephala* and *P. unifilis*). Those were the most abundant species of chelonids found during the studies performed as the basis for the park’s management plan.

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
Plant community of Campinaranas	<input checked="" type="checkbox"/>	Edaphic community of poor sandy soils, exposed to drastic variation in water availability	Several endemic species, phytocenosis restricted to Negro river basin
Fish community	<input checked="" type="checkbox"/>	Species related to the biggest black water river in the World, commercial, rare, ornamental and restricted	High level of endemism in the basin, large preserved areas with potential to new descriptions
Bird community	<input checked="" type="checkbox"/>	Populations associated with fluvial islands, Igapó forests and Campinaranas, and restricted by large rivers	New Area of Endemism (Jaú AOE), community shows high degree of endemism, and threatened and migratory species

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

4.1 - Ecological character

The Rio Negro has its headwaters located in the old geological formation of the Guianas Shield, and drains from the northwest to the southeast through an extensive area of newer tertiary-quaternary formation. This drainage has a great extension of white sand spodosols that aggregates an enormous amount of humic compounds to the river, resulting in the black color, acidic pH and low nutrient levels (Goulding et al., 1988). The Rio Negro is also characterized by the occurrence of several spots of interfluvial wetlands, that stretch over thousands of square kilometers and go through different periods of flooding over the year. In these areas the environments known as Campinas and Campinaranas are formed, directly associated to low nutrient sandy soil conditions. According to Junk et al. (2011), these interfluvial areas and associated forests cover a total area of 104,224 km², and are distributed mainly on the middle Negro river and Rio Branco basins.

Of the four largest floodplains that are found in Brazil, at least two are located on the mid/lower part of the Negro river. The biggest one is situated in the Jaú national park (22,720 km²), and the second one in the Anavilhanas national park (3,500 km²) (Junk, 2007). That is without considering the Mariuá archipelago, which is three times bigger than the Anavilhanas. Being inundated most of the time, these regions form extensive areas of Igapó forests.

The floodplains and adjacent wetlands are under the influence of predictable monomodal pulses of inundation along the year, that happen as a consequence of the wet and dry season and the geophysics of the basin. In this context, Junk et al. (1989) coined the concept of Flood Pulse (FPC), proposing that the variation in the river's discharge is the main evolutive-ecological force shaping the communities present in these systems. Therefore, the life cycles – phenology, recruitment, mortality, among others – of these biotic communities would be governed by the variations in the flooding levels in terms of annual periodicity, duration of the periods and the ebbs and flows of the water level (FVA, 1998). Such dynamics favors the adaptation and appearance of flooded areas, where the natural forest fragments and vegetation islands are governed by the water level cycles and the local geographical features (Idesam, 2017). Also, these are the conditions that lead to the development of adaptations to long periods of submergence by the vegetation. Due to the lack of capacity to photosynthesize under the dark waters, both adult and young plants reduce their metabolic rates in order to reduce energy costs and avoid accumulating toxic substances in their tissues. Several of these species remain green while submerged, being in condition to start photosynthesizing as soon as the water subsides, and some of them remain up to 8 months in this condition (Oliveira & Daly, 2001). It is also when the inundation reaches its peak that several nutrients are made available to the aquatic food webs.

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
Fresh water > Flowing water >> Mt Permanent rivers/ streams/ creeks	Rio Negro	3		Representative
Fresh water > Flowing water >> N: Seasonal/ intermittent/ irregular rivers/ streams/ creeks		4		Representative
Fresh water > Lakes and pools >> P: Seasonal/ intermittent freshwater lakes		4		Representative
Fresh water > Marshes on inorganic soils >> W: Shrub-dominated wetlands	Campinaranas	1		Unique
Fresh water > Marshes on inorganic soils >> Xf: Freshwater, tree-dominated wetlands	Igapós anda Igarapés	2		Representative

Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known
Tropical Rainforest (Floresta de Terra Firme)	

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Scientific name	Common name	Position in range / endemism / other
<i>Calophyllum brasiliense</i>	Jacaréuba, Guanandi	
<i>Heteropsis robusta</i>		
<i>Ischnosiphon polyphyllus</i>	Arumã	
<i>Macrobium acaciifolium</i>	Arapari	
<i>Minquartia guianensis</i>	Black Manwood	
<i>Ocotea cymbarum</i>	Louro-inamui	

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/ACTINOPTERYGII	<i>Apistogramma brevis</i>					endemic - restricted distribution
CHORDATA/ACTINOPTERYGII	<i>Apistogramma elizabethae</i>					endemic - restricted distribution
CHORDATA/ACTINOPTERYGII	<i>Apistogramma meinkeni</i>					endemic - restricted distribution
CHORDATA/ACTINOPTERYGII	<i>Apistogramma personata</i>					endemic - restricted distribution
CHORDATA/ACTINOPTERYGII	<i>Auchenipterichthys longimanus</i>					hunting pressure
CHORDATA/ACTINOPTERYGII	<i>Brachyplatystoma filamentosum</i>	Kumakuma				hunting pressure
CHORDATA/ACTINOPTERYGII	<i>Brachyplatystoma rousseauxii</i>	Gilded catfish				hunting pressure
CHORDATA/REPTILIA	<i>Caiman crocodilus</i>					previously endangered
CHORDATA/AVES	<i>Cranioleuca vulpina</i>	Rusty-backed Spinetail				associated to igapo forests
CHORDATA/AVES	<i>Dolospingus fringilloides</i>	White-naped Seedeater				associated to campinarana
CHORDATA/MAMMALIA	<i>Hydrochoerus hydrochaeris</i>					hunting pressure
CHORDATA/AVES	<i>Hylophilus brunneiceps</i>	Brown-headed Greenlet				associated to campinarana
CHORDATA/MAMMALIA	<i>Lontra longicaudis</i>					previously endangered
CHORDATA/REPTILIA	<i>Melanosuchus niger</i>					previously endangered
CHORDATA/AVES	<i>Myrmeciza disjuncta</i>	Yapacana Antbird				associated to campinarana
CHORDATA/ACTINOPTERYGII	<i>Nannacara adoketa</i>					endemic - restricted distribution
CHORDATA/AVES	<i>Neopipo cinnamomea</i>	Cinnamon Neopipo				associated to campinarana
CHORDATA/ACTINOPTERYGII	<i>Phractocephalus hemiliopterus</i>					hunting pressure
CHORDATA/ACTINOPTERYGII	<i>Plagioscion squamosissimus</i>					hunting pressure
CHORDATA/ACTINOPTERYGII	<i>Pseudoplatystoma fasciatum</i>	Barred sorubim; Barred sorubim				hunting pressure
CHORDATA/ACTINOPTERYGII	<i>Pseudoplatystoma tigrinum</i>					hunting pressure
CHORDATA/ACTINOPTERYGII	<i>Rhamdia schomburgkii</i>					hunting pressure
CHORDATA/AVES	<i>Rhytipterna immunda</i>	Pale-bellied Mourner				associated to campinarana

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
A: Tropical humid climate	Af: Tropical wet (No dry season)

Changes in precipitation patterns have been detected for the northern region of Amazon in years of intense El Niño (Southern Oscillation: ENSO). Marengo (2011) has demonstrated that in the years of 1926, 1983 and 1997-1998 (years of ENSO), the precipitation in the summer was lower than in normal years in northern Amazon, resulting in observed abnormally lower levels on both the Negro and the Amazonas rivers. In the years of 2005 and 2010, there were also intense droughts in the area. These droughts were not correlated with ENSO events, but do fall within the range of predicted long-term patterns provided by models of climatic warming projected to the end of the XXI century (Marengo, 2011).

The increase in both the amount and intensity of extreme climatic events is also observed in the flooding season. One of the largest floods in the Brazilian Amazon since the beginning of the record was in July of 2009.

4.4.2 - Geomorphic setting

- 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.

Rio Negro Basin

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

Please provide further information on the soil (optional)

The Rio Negro drainage basin soil is characterized by a high percentage of Spodosol, originated from alluvial deposits (Goulding et al., 1988). These soils are constituted by mineral material, being nutrient poor, having sandy texture (white superficial sands) and presenting a spodic horizon with high concentrations of humic material. The dry land areas adjacent to the main stem of the river and free from alluvial influence are composed in their majority by Latosol and Acrisol, of reddish or yellowish color. These soils are composed predominantly by mineral material, and present low phosphorous availability, low activity clay minerals and are acidic. Within this configuration the "Terra Preta de Índio" (Black soil of the indians, lit. translation) soils can also be found. With dark brown or black color, these soils are dystrophic Latosols with high carbon content in the A anthropic horizon.

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
Water inputs from groundwater	<input checked="" type="checkbox"/>
Water inputs from rainfall	<input checked="" type="checkbox"/>

Water destination

Presence?
To downstream catchment

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 hydrological regime is classified as Equatorial. Months of December to April show increasing water levels, which reach its maximum at May or Jun. The ebb period begins around July, reaching minimum levels in October or November months. The velocity of decreasing is higher than the velocity of increasing water levels. In general, the stages of the Negro river present mean annual amplitude of 11 m, with maximum reaching 15-16 m (Alves, 2013). The fluctuations of water level in the lower Negro river are strongly influenced by the Solimões River (main channel of the Amazon), which causes an obstruction in the region known as the "Water Meeting" ("Encontro das Águas"), controlling the magnitude of the flood events on the Negro river (Idesam, 2017). In a gauge station located in the extreme downstream of the Site, in the Piracatuba municipality, the mean discharge found was 33,356 m³/s, with maximum of 59,603 m³/s in July, and minimum of 15,174 m³/s in December. The mean velocity of the water was 0.4 m/s, with maximum of 0.63 m/s in the wet season, and minimum of 0.23 m/s in the dry season (observed during the increase of the levels) (Idesam, 2016).

(ECD) Stratification and mixing regime	The main stem of the river tends not to present stratification. In the rainy season, occurs a mixture of water with a large amount of biologic material deposited in alluvial plains, making the dissolved oxygen levels decrease to zero in some points.
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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

(ECD) Water turbidity and colour	The black Waters of the Negro River have high color values, ranging around 120 mg Pt/l.
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(ECD) Water temperature	The water temperatures varies from 28°C to 31°C.
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4.4.6 - Water pH

Acid (pH<5.5)

Circumneutral (pH: 5.5-7.4)

Alkaline (pH>7.4)

Unknown

Please provide further information on pH (optional):

The pH and conductivity are generally very low, indicative of the marked acid character and the high electrolyte deficiency of the Negro river water. Due to the large extension of this Site, there may be high variability in water quality parameters, and there are many regions that have never been monitored. Measurements in representative areas found pH varying from 3.2 to 4.7 in the Anavilhanas archipelago (Idesam, 2017), and from 3.8 to 4.9 in the RDS Rio Negro Conservation Unity (Idesam, 2016). Junk et al. (2011) consider a pH range of 4 to 5 for the Negro river. In lakes of the Anavilhanas archipelago, it were observed pH values varying from 3.8 to 5.3 (Idesam, 2017).

4.4.7 - Water salinity

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

(EOD) Dissolved gases in water

Due to the large extension of the Site, dissolved oxygen levels can vary greatly between the various environments present. The dissolved oxygen concentrations are high and constant in the majority of the small tributaries of the river, with basin smaller than 200 km², which present oxygen concentrations near saturation levels (~7 mg/l). In rivers with area of the basin bigger than 200 km², the dissolved oxygen levels decrease gradually (FVA, 1998). This decrease takes place in function of the increase of temperatures, which decreases the O₂ saturation concentrations. Also, the higher depths decrease the effect of gas exchanges with atmosphere. The lowest values found (~2.7 mg/l) are near the tolerance limit for many aquatic organisms (FVA, 1998).

4.4.8 - Dissolved or suspended nutrients in water

- Eutrophic
- Mesotrophic
- Oligotrophic
- Dystrophic
- Unknown

(EOD) Water conductivity In general, low conductivity, varying from 6.0 to 13.0 µS/cm (Idesam, 2017).

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.

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)	High
Fresh water	Drinking water for humans and/or livestock	High
Fresh water	Water for irrigated agriculture	Low
Wetland non-food products	Timber	not relevant for site
Wetland non-food products	Other	High
Biochemical products	Extraction of material from biota	Medium
Genetic materials	Medicinal products	not relevant for site

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Storage and delivery of water as part of water supply systems for agriculture and industry	High
Maintenance of hydrological regimes	Groundwater recharge and discharge	High
Erosion protection	Soil, sediment and nutrient retention	High
Climate regulation	Local climate regulation/buffering of change	High
Climate regulation	Regulation of greenhouse gases, temperature, precipitation and other climatic processes	High

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Recreational hunting and fishing	Medium
Spiritual and inspirational	Spiritual and religious values	High
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 microorganisms, the genes they contain, and the ecosystems of which they form a part	High
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	High

Within the site:

Outside the site:

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

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

Description if applicable

The indigenous peoples help to increase the fauna and flora diversity because they have unique ways of live and manage the locals. Recent researches have shown that Indians were of crucial importance to the formation of the biodiversity of South America. A lot of plants, as example, appeared as products of management techniques of the forest, like the Brazilian-nut, "pupunha", Cocoa, "babaçu", Yucca... (ISA, 2017b). The management of indigenous people on the biodiversity had a crucial role on the formations of Brazilian landscapes, like the Amazon. This management included the transformation of the poor Amazon soil in a very fertile one, the "Terra Preta de Índio" ("Indigenous Black Soil"). It is estimated that at least 12% of all Amazon land were transformed by men through this process (ISA, 2017b).

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	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Provincial/region/state government	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Local authority, municipality, (sub)district, etc.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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

There are indigenous lands within the Ramsar site and in the surrounding area.

5.1.2 - Management authority

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

i) Secretaria de Biodiversidade do Ministério do Meio Ambiente do Brasil - SBio/MMA;
 ii) Instituto Chico Mendes de Conservação da Biodiversidade - ICMBio;
 iii) Secretaria Estadual de Meio Ambiente do Estado do Amazonas -SEMA/AM;
 iv) Instituto de Proteção Ambiental do Amazonas - Ipaam
 v) Fundação Nacional do Índio - FUNAI
 vi) WCS Brasil Amazon;
 vii) Prefeitura de Santa Isabel do Rio Negro;
 viii) Secretaria de Meio Ambiente de Novo Airão

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

i) José de Oliveira MMA ii) Ricardo Soavinski ICMBio iii) Marcelo de Lima SrioEdo Amazonas iv) Marcelo Dutra Ipaam v) Rodrigo Paranhos FUNAI vi) Carlos Durigan WCSBrasilAmazon vii) Araildo Mendes Prefeito Stalsabel RioNegro viii) Kleber Bachara SrioMpal NovoAirão

Postal address:

i) Ed. Marie Prendi Cruz; SEPN 505 Norte, Bloco "B" 5º andar sala 504; CEP 70.730-542 - Brasília/DF
 ii) EQSW 103/104, Complexo Administrativo, Bloco C, 1º Andar - Setor Sudoeste; Cep 70.670-350 - Brasília/DF
 iii) Avenida Mário Ipiranga Monteiro, 3280 Parque Dez; CEP: 69050-030 – Manaus/AM
 iv) Av. Mario Ypiranga, 3280 - Parque Dez; Cep: 69050-030 - Manaus/AM
 v) SCS - Quadra 09 Bloco B Ed. Parque Cidade Corporate; CEP 70.308-200 - Brasília/DF
 vi) Rua Costa Azevedo 9, Sala 403, Centro - Manaus/AM
 vii) Palácio Municipal Capitão Noé de Carvalho; Av. Barão do Rio Branco, 1060; Centro - Santa Isabel do Pará/PA
 viii) Rua Santos Dumont, s/nº; CEP 69730-000 - Novo Airão/AM

Emails:

i) jose.pedro@mma.gov.br; ii) ricardo.soavinski@icmbio.gov.br; iii) gabinete@sema.am.gov.br; iv) gabinete@ipaam.am.gov.br; v) dpds@funai.gov.br; vi) WCSbrasil@wcs.org; vii) ouvidoria@santaizabel.pa.gov.br; viii) -

E-mail address:

jose.pedro@mma.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
Tourism and recreation areas	Low impact	Low impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Housing and urban areas	Low impact	Medium impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Water abstraction	Low impact	Medium impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Annual and perennial non-timber crops	Low impact	High impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Energy production and mining

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

Transportation and service corridors

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Roads and railroads	Low impact	Medium impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Hunting and collecting terrestrial animals	High impact	High impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fishing and harvesting aquatic resources	High impact	High impact	<input checked="" 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
(Para)military activities	Low impact	Medium impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Vegetation clearance/ land conversion	High impact	High impact	<input checked="" 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"/>

5.2.2 - Legal conservation status

Global legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
UNESCO Biosphere Reserve	Central Amazon	http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?mode=all&code=BRA+05	partly
World Heritage site	Central Amazon Conservation Complex	http://whc.unesco.org/en/list/998	partly

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Indigenous land	Alto Rio Negro Indigenous land	national government	partly
conservation unit	Parque Estadual Rio Negro Setor Norte	state government	whole
conservation unit	Parque Estadual Rio Negro Setor Sul	state government	whole
conservation unit	Parque Nacional do Jaú	federal government	whole
conservation unit	Reserva Extrativista do Rio Unini	federal government	whole
conservation unit	Reserva Particular do Patrimônio Natural Ilhas Alexandre Rodrigues Ferreira	federal government	whole
conservation unit	Reserva de Desenvolvimento Sustentável Amanã	state government	whole
conservation unit	Reserva de Desenvolvimento Sustentável Puranga Conquista	state government	whole
conservation unit	Reserva de Desenvolvimento Sustentável do Rio negro	state government	whole
conservation unit	Reserva de Desenvolvimento Sustentável do Tupé	municipal government	whole
conservation unit	Área de Proteção Ambiental Jufari	municipal government	whole
conservation unit	Área de Proteção Ambiental Margem Direita do Rio Negro-Setor Paduari-Solimões	state government	whole
conservation unit	Área de Proteção Ambiental Margem Esquerda do Rio Negro-Setor Tarumã Açutatumã Mirima	state government	whole
conservation unit	Área de Proteção Ambiental Margem Esquerda do Rio Negro-Setor Aturiá-Apuauzinho	state government	whole
conservation unit	Área de Proteção Ambiental Maria	municipal government	whole
conservation unit	Área de Proteção Ambiental Municipal Tapuruquara		partly
conservation unit	Área de Proteção Ambiental Taruma/Ponta Negra	municipal government	partly
conservation unit	Área de Relevante Interesse Ecológico Projeto Dinâmica Biológica de Fragmentos Florestais	federal government	whole
indigenous land	Cuiu-Cuiu indigenous land	national government	whole
indigenous land	Jurubaxi-Téa indigenous land	national government	partly
indigenous land	Maraã Urubaxi indigenous land	national government	whole
indigenous land	Médio Rio Negro I indigenous land	national government	partly
indigenous land	Parana do Boa Boa indigenous land	national government	whole
indigenous land	Rio Téa indigenous land	national government	partly
indigenous land	Uneiuxi indigenous land	national government	whole

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Arquipélago de Anavilhanas	http://datazone.birdlife.org/site/factsheet/arquip%C3%A9lago-de-anavilhanas-iba-brazil	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

Human Activities

Measures	Status
Communication, education, and participation and awareness activities	Implemented

Other:

Socio-environmental Program of Rio Negro: implemented
Territorial and Environmental Management Plans: proposed

5.2.5 - Management planning

Is there a site-specific management plan for the site? Yes

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

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

Protected Areas Monitoring Program: implemented

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

Attachment "References"

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

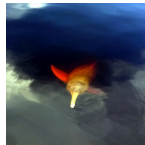
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6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:



Camila Ferrara (*Camila Ferrara, 2017*)



Carlos Durigan (*Carlos Durigan, 2017*)



Carlos Durigan (*Carlos Durigan, 2017*)



WCS Brasil (*WCS Brasil, 2017*)

6.1.4 - Designation letter and related data

Designation letter

<1 file(s) uploaded>

Date of Designation