IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 15 September 2014

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Pantanal Conservation Complex

SITE INFORMATION

Country:
Brazil
Inscribed in: 2000
Criteria:
(vii) (ix) (x)

Site description:

The Pantanal Conservation Area consists of a cluster of four protected areas with a total area of 187,818 ha. Located in western central Brazil at the south-west corner of the State of Mato Grosso, the site represents 1.3% of Brazil's Pantanal region, one of the world's largest freshwater wetland ecosystems. The headwaters of the region's two major river systems, the Cuiabá and the Paraguay rivers, are located here, and the abundance and diversity of its vegetation and animal life are spectacular.
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SUMMARY

2014 Conservation Outlook

Significant concern

The site has a relatively effective management system. However, major current threats from sedimentation and pollution, and projected threats from harmful land use change, climate change and the construction of multiple dams upstream of the site are major issues that cannot be dealt with at a site level.. The natural hydrological regime of the site has already been destabilized and further land use change and hydropower development upstream will alter natural phenomena even more.

Current state and trend of VALUES

High Concern
Trend: Deteriorating

Overall, natural beauty and aesthetic importance are currently intact. However, natural phenomena, natural processes and biodiversity of the site are being impacted by changes to the natural ecosystems. The natural hydrologic regime has already been destabilized and further land use change and hydropower development upstream will alter natural phenomena even more.

Overall THREATS

Very High Threat

Current threats from the sedimentation of the site’s waterways, pollution from major urban centers and from mining, construction of roads and dykes, cattle ranching and conversion of natural habitats to exotic pasture are significant, but the predicted effects from upstream harmful land use change, climate change and the development of hydropower dams will be even more devastating to the site’s Outstanding Universal Value.

Overall PROTECTION and MANAGEMENT

Some Concern

The site has a relatively effective management system. However, the current major threats to the site, such as sedimentation and pollution,projected threats from climate change, land use change, as well as the development of numerous hydropower dams upstream of the site are issues that cannot be addressed at the site level, but rather must be dealt with at the national and international level.

FULL ASSESSMENT

Description of values

Values

World Heritage values

► Unique natural phenomenon
Criterion:(vii)

The Greater Pantanal region, an immense alluvial plain, contains a unique ensemble of ecosystems. The WHS, the Pantanal Conservation Complex is representative of a small portion of the Pantanal and consists of a cluster of four protected areas (the Pantanal National Park and three adjacent Private Reserves) with a total area of 187,818 hectares. It includes almost permanently flooded lowland and a good sample of the gradient of biotopes to be found in the Pantanal as a consequence of the presence of the Serra do Amolar. During the rainy season – between October and April – vast areas of the alluvial plains become flooded almost entirely. Temporary lagoons and bays are formed. This phenomenon confers to the site its unique scenic beauty. (draft SoOUV, 2011).

► On-going ecological processes
Criterion:(ix)

The site demonstrates the on-going ecological and biological processes that occur in the Pantanal. The association of the Amolar Mountains with the dominant freshwater wetland ecosystems confers to the site a uniquely important ecological gradient. The site plays an important role in the dispersion of nutrients to the entire basin and is an important reserve for maintaining fish stocks in the Pantanal. It contains an extensive area that remains partially flooded during the dry season serving as a natural wildlife

refuge for some species. (UNEP-WCMC, 2011).

► High biodiversity and threatened species

Criterion:(x)

The area preserves habitats representative of the Pantanal that contain a number of globally threatened species. The vegetation is located in an area of transition between the dry savannah (cerrado) of central Brazil and the semi-deciduous forest of the south and south-east. The extremely diverse fauna of the site includes about 90 mammal species, 700 bird, 160 reptiles, 45 amphibians and 260 fish species. There are abundant Yacare caiman Caiman crocodilus yacare and capybara Hydrochoerus hydrochaeris.Species of conservation concern, such as jaguar Panthera onca, white-lipped peccary Tayassu pecari, giant otter Pteronura brasiliensis, maned wolf Chrysocyon brachyurus, giant armadillo Priodontes giganteus (VU), giant anteater Myrmecophaga tridactyla (VU) and marsh deer Blastocerus dichotomus (VU), are relatively common in the area. Other common Pantanal species include black howler monkey Alouatta caraya, South American coati Nasua nasua, neotropical river otter Lontra longicaudis, tayra Eira barbara, ocelot Leopardus pardalis, jaguarundi Puma yagouaroundi and several other small canids and felids, lowland tapir Tapirus terrestris (VU), pampas deer Ozotoceros bezoarticus, red and grey brocket deer Mazama spp., collared peccary Pecari tajacu and anaconda Eunectes murinus (UNEP-WCMC, 2011).

Other important biodiversity values

► Other international designations

The complex lies within a WWF Global 200 Eco-region and is both a Ramsar Wetland and a
UNESCO Man & Biosphere Reserve. (UNEP-WCMC, 2011)

Assessment information

Threats

Current Threats

Very High Threat

The greatest current threat is from the sedimentation of the site's waterways, mostly caused by massive deforestation, conversion of natural habitats to exotic pasture, and industrial agriculture in the adjacent Planalto Region, but increasingly from deforestation in the Pantanal Region as well. Hydrologic alterations related to erosion and dams in the headwaters and accelerated siltation and river channelization projects on the floodplain threaten the natural flood pulse and associated ecosystem productivity of the entire Pantanal. Pollution from major urban centers and from mining is also significant. The construction of roads and cattle ranching add to the pressures on the site.

► Invasive Non-Native/ Alien Species

High Threat
Inside site
Outside site

The Asian clam probably was introduced through ballast water ships sailing in the La Plata basin (MMA, 2003 in Tocantins, 2006), in Rio Paraguay, Gaíva Bay Area Bela Vista North, Stream Zé Dias, and the Near the mouth of Rio Cuiaba in Paraguay (Tocantins, 2006).
Escape of Amazonian species from fish farms has also occurred: tambaqui Colossoma macropomum and tucunaré Cichla sp.
Domestic dogs and Africanized bees are present in Southern Pantanal (Boff et al. 2011).

► Erosion and Siltation/ Deposition

Very High Threat

Inside site
Outside site

Erosion and sedimentation associated with an increase in exotic grass-based cattle grazing and row crop production in the uplands of the Cerrado surrounding the Pantanal are a significant threat to the site. Large areas of Cerrado have been logged and cleared for massive agribusinesses, mostly soybean production for export. Deforestation within the Pantanal region is also a growing threat. It has quadrupled in recent years and the Pantanal could disappear by 2050: Already by 2006, 17% of the region’s original vegetation had been lost. These massive land use changes in the Pantanal and Cerrado Regions have led to an altered pattern of flooding and dramatically increased siltation of major rivers. Some areas of the Pantanal which used to experience a seasonal flood cycle now remain flooded throughout the year, reducing natural productivity and available pasture for cattle. Because Cerrado soils are poor, farmers use vast amounts of fertilizers and pesticides which have greatly increased the pH level of several important waterways (UNEP-WCMC, 2011; Taazik, et al, 2004; Dantas in Tazik, et al, 2004; IUCN Consultation, 2014)

► Water Pollution

High Threat
Inside site
Outside site

Problems of organic pollution of the rivers in the vicinity of major urban centers and pollution from agro chemicals are worsening. Millions of gallons of untreated wastewater, sewage, organic wastes, agrochemicals, and storm run-off enter the waterways each day from the upstream populations. Pollution by mineral extraction is also a serious threat. The illegal use of mercury to extract gold releases huge amounts of the poison via rivers flowing into the Pantanal: Recent studies indicate high levels of mercury in kingfishers, raptors and native fish. (UNEP-WCMC, 2011; Palermo in Tazik, et al., 2007). Results of Sartini Dutra Pimenta et al. (2013) demonstrate that the Paraguay River water near Caceres has been receiving genotoxic effluents, which may be associated with the presence of chromium, sulfides, oil and grease, and/or other chemicals.

► Roads/ Railroads, Dams/ Water Management or Use

Low Threat
Outside site

Dykes and canals built on upstream farms for new pastures alter water flow patterns and intensify floods downstream, affecting the natural balance between wet and dry seasons and the Park's capacity as a hydrological buffer (UNEP-WCMCM, 2011)
Elevated roads constructed outside the Park are altering the natural flood regime and drainage patterns of the Pantanal (Tomas et al. 2009)

► Shipping Lanes

Low Threat
Inside site
Outside site

Heavy barge traffic is damaging banks along the Paraguay River, and proposed projects for increasing barge traffic by straightening and dredging the Upper Paraguay River may alter the hydrology of the entire Pantanal (Gottgens et al. 2001). The lower part (river) is heavily utilized for grain transportation by large barges (IUCN Consultation, 2014).

► Livestock Farming / Grazing

Very High Threat
Inside site
Outside site

Cattle ranching is an old tradition in the Pantanal and is generally compatible with the ecological functions of the region if naturally-open native pastures are used for grazing. . However, high levels of cattle activity and foraging negatively impact forest and wetland vegetation and forest frugivores, and cattle contribute to eutrophication of aquatic environments (Eaton 2013). Cattle operations also have adverse effects when fires are set for new grass, river banks are eroded,, soil infiltration is reduced, and the area of wildlife habitat is reduced. (UNEP-WCMC, 2011) Intensive cattle ranching using planted exotic pasture is a serious threat to long-term persistence of the Pantanal and bordering Cerrado. Conversion of native forests, savannas and wetlands to exotic grass monocultures (>15% of Pantanal area) is causing losses of biodiversity (e.g., forest plants & frugivores), ecosystem services

(e.g., hydrologic regulation, water purification & carbon sequestration), and altering ecological processes (e.g., ecosystem productivity, seed dispersal & wildlife movements) (IUCN Consultation, 2014).

Potential Threats

Very High Threat

In the long run, the impacts of climatic change might be severe for the site's biodiversity, and this will be accentuated by the changes in vegetation cover and hydrologic cycles caused by upstream land use change and dams.

► Dams/ Water Management or Use

Very High Threat
Outside site

Dams in the upper watersheds outside the Park have changed the dynamics of river flows, altering the flood pulse of the Pantanal that is key to its productivity (Calheiros 2012)
44 hydroelectric dams currently in operation and 91 more in the planning stages in the northern headwaters of the Pantanal upstream from the Park, such as the large Manso reservoir in the upper Cuiaba catchment, represent significant current and future threats to the stability of the Pantanal's complex hydrologic regime . (UNEP-WCMC, 2011; Calheiros 2012)

► Temperature changes

High Threat
Inside site
Outside site

The site is one of the 12 World Heritage sites where it is projected that the greatest species loss will occur (67.7% by 2100). The Pantanal wetlands are projected to dry up and turn to savannah as hotter temperatures affect rains. More severe storms are projected as well. (Hotlist, 2011; Planet Ark, 2007)

Protection and management

Assessing Protection and Management

► Integration into regional and national planning systems

Data Deficient

Data deficient

► Relationships with local people

Some Concern

Relationships with local people are relatively positive. Site’s lands are federally owned, and those of the private reserves are owned by conservation organizations that share the conservation values of the site. There are no inhabitants within the Park and only occasional incursions of cattle from neighboring ranches occur. An Advisory Council brings together relevant government agencies, NGOs and local community representatives to advise on management (draft SOUV, 2011; Tazik, et al, 2004).

► Legal framework and enforcement

Mostly Effective

The Pantanal Matogrossese National Park was established by Federal Decree in 1981; and the three Private Reserves were designated by Federal Decree in 1996. The establishment of privately-owned reserves is conditioned on the understanding that they will be managed for conservation purposes in perpetuity. The National Park was declared a Wetland of International Importance (Ramsar Site) in 1993 and as the core zone of a Biosphere Reserve in 2000 (IUCN, 2000).
Pantanal Matogrossense National Park is owned by the Federal government; the Private Natural Heritage Reserves are owned by the Ecotrópica Foundation which manages them. Law enforcement is carried out by Forest Police. (UNEP-WCMC, 2011)

► Management system

Mostly Effective

The Pantanal National Park is managed by the Instituto Chico Mendes

(ICMBio), a semi-autonomous agency of the Environment Ministry (MMA). Management is guided by a management plan adopted in 2004. The Ecotropica Foundation, a Brazilian NGO, manages the three private reserves (Acurizal, Penha and Doroche) that are an integral part of the property (UNEP-WCMC, 2011). A recently provided Rapid Response Facility Grant bridges support to Ecotropica to sustain critical operations over a six-month period – and to allow time to create the building blocks for a sustainable financial future. Ecotropica was able to quickly re-build its finances, and is better positioned to ensure the long-term integrity of the sites it manages. (Rapid Response Facility, 2012)

► Management effectiveness

Mostly Effective

Formal evaluations of management effectiveness for the Pantanal National Park in 2005-2006 and 2010, using the RAPPAM method, found overall management effectiveness of the property to be good for both evaluations, though the rating had slipped from the 1st to the 2nd evaluation (70% to 64%). The 2010 ratings were highest (above 70%) for biological and socio-economic importance, legal support, initial design and planning of the area, objectives (clarity and appropriateness), decision-making and results. It received the lowest scores (50% or lower) in terms of infrastructure, financial resources, and human resources (ICMBio, 2012).

► Implementation of Committee decisions and recommendations

Data Deficient

No Committee decisions have been taken on the property since its inscription.

► Boundaries

Highly Effective

The boundaries are clear and well planned, are marked on the ground, and during high waters, are marked by buoys (UNEP-WCMC, 2011).

► Sustainable finance

Some Concern

Finances are inadequate for implementing the management plan (ICMBio,

2012).

▶ Staff training and development

Some Concern

The level of staffing is too low to enable full implementation of the management plan (ICMBio, 2012). The Ecotrópica Foundation runs a sister park project with Everglades National Park to improve staff training and park management (UNEP-WCMC, 2011).

▶ Sustainable use

Mostly Effective

The uses of the site for tourism, research, and scattered grazing by cattle are sustainable (ICMBio, 2012). The site is a no-take zone for fishing and has been an important reserve for maintaining the Pantanal's fish stocks (UNEP-WCMC, 2011).

▶ Education and interpretation programs

Data Deficient

An environmental education program is being implemented, though details are not available. (draft SoOUV, 2011)

▶ Tourism and interpretation

Mostly Effective

The National Park is not open to tourism at present (ICMBio, 2012). Ecotrópica has a visitor center at Acurizal. A number of ranches (fazendas) ranging from comfortable to basic, provide accommodation and food.

▶ Monitoring

Mostly Effective

Research and monitoring are rated as fair by the evaluation of management effectiveness (ICMBio, 2012). Periodic monitoring is done by ICMBio and the Forest Police, by photographic survey, satellite image analysis and by water quality specialists (UNEP-WCMC, 2011).

▶ Research

Highly Effective

The Complex has good infrastructure for researchers, a visitors' centre, accommodation and a laboratory for scientists. The Ecotrópica Foundation headquarters in the Acurizal Reserve was renovated in 1995-96, with funds from the National Environment Program, and has excellent facilities for visitors and scientists. A Research Plan for the National Park was drawn up in 1997 with the assistance of the Nature Conservancy (TNC) after discussion with the various stakeholders (UNEP-WCMC, 2011). Brazil's president commissioned the creation of the National Research Institute of the Pantanal (INPP), within the Federal University of Mato Grosso (UFMT), Cuiabá campus. The installation of the institute, encouraged by the Pantanal Research Center (CPP) and the National Institute of Science and Technology in Wetlands (Inau), would strengthen research in the Pantanal, covering natural and human sciences (UFMT 2014)

Overall assessment of protection and management

Some Concern

The site has a relatively effective management system. However, the current major threats to the site, such as sedimentation and pollution,projected threats from climate change, land use change, as well as the development of numerous hydropower dams upstream of the site are issues that cannot be addressed at the site level, but rather must be dealt with at the national and international level.

▶ Assessment of the effectiveness of protection and management in addressing threats outside the site

Serious Concern

The major threats originating from outside the Property, such as land use change, hydrologic alterations, sedimentation and pollution are too extensive to be manageable by the Park Administration or by ICMBio.

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ Unique natural phenomenon

High Concern
Trend:Deteriorating

Scenic beauty and aesthetic importance are still relatively intact (ICMBio, 2012; UNEP-WCMC, 2012). The site's values related to natural phenomena, e.g., the flood pulse, productivity and waterbird aggregations, are deteriorating due to harmful land use change and erosion, and dams in headwater regions that are strongly affecting natural phenomena on the floodplain.

▶ On-going ecological processes

Critical
Trend:Deteriorating

The natural hydrologic regime has already been destabilized and further land use change and dams upstream will alter natural phenomena even more. Natural processes are being changed by large-scale sedimentation and pollution of waterways. Water courses are filling in, water drainage is less complete during the dry season, and both are provoking changes to flora and fauna (Tazik, et al, 2004; IUCN Consultation, 2014).

▶ High biodiversity and threatened species

High Concern
Trend:Deteriorating

Biodiversity of the site is currently being impacted by changes to the natural ecosystems being brought about sedimentation and pollution of the site's waterways and introduction of invasive species. These changes will be likely accelerated by climate change, land use change and the construction of multiple dams upstream from the site.

Other important biodiversity values

▶ Other international designations

The complex lies within a WWF Global 200 Eco-region and is both a Ramsar Wetland and a
UNESCO Man & Biosphere Reserve. (UNEP-WCMC, 2011)

Summary of the Values

▶ Assessment of the current state and trend of World Heritage values

High Concern

Trend: Deteriorating

Overall, natural beauty and aesthetic importance are currently intact. However, natural phenomena, natural processes and biodiversity of the site are being impacted by changes to the natural ecosystems. The natural hydrologic regime has already been destabilized and further land use change and hydropower development upstream will alter natural phenomena even more.

Additional information

Key conservation issues

▶ Pollution

National

Problems of organic pollution of the rivers in the vicinity of major urban centers and pollution from agro chemicals are worsening. Millions of gallons of untreated wastewater, sewage, organic wastes, agrochemicals, and storm run-off enter the waterways each day from the upstream populations. Pollution by mineral extraction is also a serious threat. The illegal use of mercury to extract gold releases huge amounts of the poison via rivers flowing into the Pantanal: Recent studies indicate high levels of mercury in kingfishers, raptors and native fish. (UNEP-WCMC, 2011; Palermo in Tazik, et al, 2007)

▶ Dams

National

44 hydroelectric dams currently in operation and 91 more in the planning stages in the northern headwaters of the Pantanal upstream from the Park, such as the large Manso reservoir in the upper Cuiaba catchment, represent significant current and future threats to the stability of the Pantanal's complex hydrologic regime (UNEP-WCMC, 2011).

▶ Sedimentatio

Local

Erosion and sedimentation associated with expansion of large-scale agriculture and exotic grass-based cattle ranching in the watersheds of the Cerrado Region surrounding the Pantanal are significant threats exacerbated by growing deforestation within the Pantanal region itself. (WDPA, 2011; Taazik, et al, 2004; Dantas in Tazik, et al, 2004)

Benefits

Understanding Benefits

▶ Is the protected area valued for its nature conservation?

Inscription of the property as a World Heritage site indicates the conservation values associated with its OUV.

▶ Importance for research

Research in the site is valued because of its pristine nature in comparison with other sites in the Pantanal outside the property.

▶ Water provision (importance for water quantity and quality)

Although figures are for the entire Pantanal region, ecosystem services estimates are around USD112 billion per year (WWF 2012)

Summary of benefits

The major values of the Property, both nationally and internationally, are conservation and the generation of knowledge.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Centro de Pesquisa do Pantanal (CPP)		Projeto Sinergia, among others.
2	Embrapa-Pantanal		Embrapa conducts a range of important research relevant to conservation of the WH site and the Pantanal, including studies of hydrology, climate, fisheries, water quality, wildlife, exotic species, and the impacts of erosion and siltation and the installation of dams and hydropower plants in headwater basins.
3	Wildlife Conservation Society of Brazil (WCS-Brasil)		To conserve biodiversity and ecosystem services, and mitigate regional CO2 emissions, WCS-Brasil is working with private landowners to promote the adoption of sustainable land use practices in the Pantanal and in bordering headwater regions of the Cerrado. Research and monitoring focuses on key wildlife species and aquatic environments in relation to land use trends and practices.
4	Instituto Homem Pantaneiro		Various. For example, The Institute donated to the Jatobazinho School native fish species of the Pantanal. The Fish Culture project aims to decrease overfishing and increase family income, stimulating and training the population on fish farming.
5	REPAMS		NGO that facilitates establishment of RPPNs, Instituto Arara Azul (hyacinth macaw conservation)
6	Ecotropica		Manages the three private reserves part of the Pantanal Complex
7	WWF		“Ciclo das Águas do Pantanal” and the publication "Movimento pelas Águas do Rio Cabaçal: cuidando das cabeceiras do Pantanal" as examples of WWF work in the area.

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years
1	N.A.	Development of a Trust Fund for improved financing and therefore management of the Park.	

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