# Pantanal

## PROGRAMME

Promoting sustainable development


Fotos: © WWF / Gustavo YBARRA

# The Upper Paraguay River Basin

With its 600,00 km$^2$ and expanding across Boliva, Brazil and Paraguay, the Upper Paraguay River Basin, located in center-eastern South America, is one of the most important Basins for the continent and the world. In its southern portion it meets the Paraná Basin, conforming one large wetland system: the Paraguay-Paraná System, which sustains a population of more than 21 million people in five countries: Argentina, Uruguay, Brazil, Bolivia and Paraguay.

The Upper Paraguay River Basin, and thus the Paraguay-Paraná wetland system, is regulated by one of the largest flood plains in the world: the 'Gran Pantanal', extending along Brazil, Bolivia and Paraguay with approximately 158,000 km$^2$.

In Bolivia, the Pantanal encompasses roughly 32,000 km$^2$ and regulates floods and droughts, especially in the eastern portion of the country, by uniformly retaining and distributing the floods of the Paraguay River, acting as a sponge, and this way also spreads the sediments and nutrients necessary to maintain its high biodiversity. This hydric regulation turns the Pantanal into a highly productive ecoregion.

# Pantanal, an internationally important wetland

The location of the Pantanal between the two largest Basins in South America – Plata and Amazon – as well as its high productive capacity make it a natural bio-geographical corridor and allows for the interaction of these two ecoregions. Thus, it is not surprising that the Pantanal has a very rich diversity of fauna and flora typical ofthe Amazon, Chiquitano Forest, Chaco and Cerrado ecosystems.

Identified by WWF as one of the 200 priority ecoregions for worldwide conservation, the Pantanal is a critical habitat for seriously threatened species such as the Marsh deer (*Blastocerus dichotomus*), the Hyacinth macaw (*Anodorhynchus hyacinthinus*), the Giant river otter (*Pteronura brasiliensis*) and others. At least 120 species of mammals, 650 of birds, 90 of reptiles, 40 of amphibians, 260 of fish, 1,030 of butterflies and 1,650 species of superior plants have been registered so far.

The richness of this wetland and the diversity of its fauna prompted the Bolivian government, with support from WWF, to designate the entire Bolivian Pantanal as Ramsar Site, recognizing it as a wetland of international importance.



## Ramsar Sites

Ramsar is the name of the Convention on Wetlands of International Importance, especially as aquatic species habitats.

The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. There are presently 155 Contracting Parties to the Convention, with 1674 wetland sites, totaling 150 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance.

Wetlands are flooded surfaces covered by fresh, salty or salted, stagnant or flowing water. On the other hand, wetlands can be permanently flooded or only be covered by water during certain seasons.

In 1997 the Prefecture of Santa Cruz, recognizing the environmental, social and economic values of the Pantanal, and enforcing the Land Use Plan (PLUS) for Santa Cruz, promoted the declaration of two national protected areas in the Bolivian Pantanal:

- Otuquis National Park and Natural Integrated Management Area, in the southern portion of the Bolivian Pantanal
- San Matías Natural Integrated Management Area, in the northern portion of the Bolivian Pantanal.

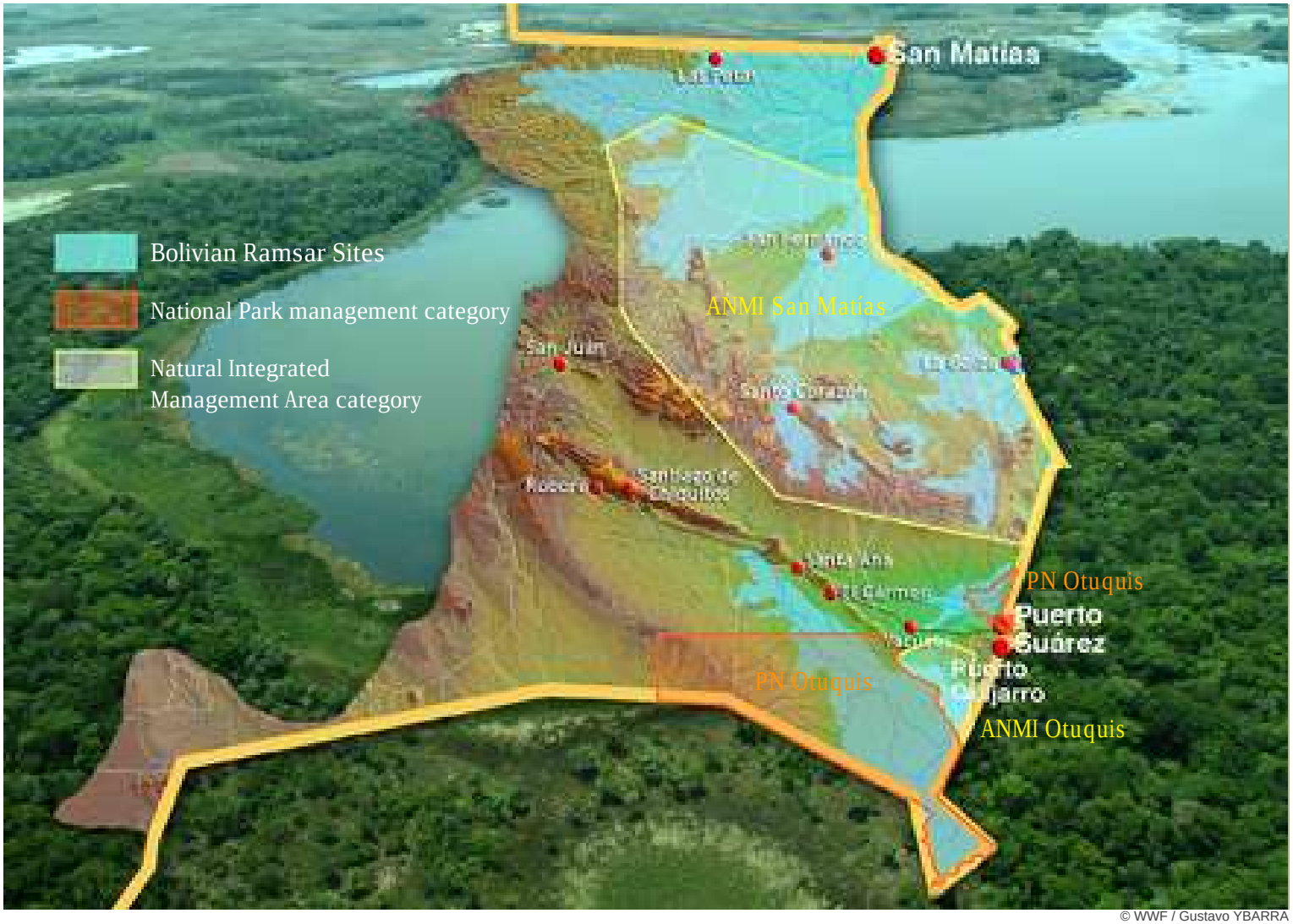
Both declarations were greatly assisted by technical support from the Noel Kempff Mercado Museum of Natural History and WWF. In 1997 both areas were officially declared via supreme decrees as national protected areas: DS 24762 for Otuquis and DS 24734 for San Matías.

## San Matías Protected Area

The Natural Integrated Management Area San Matías, referred to in Bolivia as ANMI San Matías, is the second largest protected area in Bolivia with 2.9 million hectares, as well as one of the largest in South America. It is located in the eastern part of the Department of Santa Cruz.

It protects key areas in the upper Basin of the Paraguay River, as well as in the Chiquitano Sunsá mountainous region, covered with Dry Chiquitano Forest, a high habitat in terms of its biodiversity, as well as encompassing an important portion of Pantanal's flooded areas.

The ANMI management category indicates that, aside from its natural attributes, there are also people and communities inhabiting within its boundaries, which are allowed to use its natural resources in sustainable productive activities, such as forest management, fishing, cattle ranching and others.



# The region’s local population

In Bolivia, the Upper Paraguay River Basin is made up of nine municipalities: San Ignacio, San Rafael, San José, Roboré, San Matías, El Carmen Rivero Torres, Puerto Quijarro, Puerto Suárez and Charagua, and has an estimated population of 88,000 people.

Within the Upper Paraguay River Basin, the Bolivian Pantanal has four municipalities: San Matías, El Carmen Rivero Torres, Puerto Suárez and Puerto Quijarro, with roughly 46,000 inhabitants, mainly descendants of chiquitano and ayoreode indigenous groups yet also consisting of immigrants from other areas of Santa Cruz and Bolivia. The population in the Bolivian Pantanal is dedicated primarily to commerce, industry, cattle ranching, transportation and small scale agriculture.



# Sustainable development

The Pantanal has a high economic potential due to a series of factors:

- It is strategically located in terms of facilitating the transportation of both goods and travelers in general to the neighboring country of Brazil.
- It is the projected site of the future construction of a development hub
- Is has a high ecotourism potential
- Presence of mining activities and extraction of other natural resources
- Proximity with Brazil, Bolivia’s main business partner.

Because of this, there is a need to develop participatory mechanisms that create a balance between industrial and human development, as well as maintaining the quality of the wetland environment, which is the foundation for the region’s economic development.

© WWF / Gustavo YBARRA

© WWF / Gustavo YBARRA

## Otuquis Protected Area

The Otuquis National Park and Natural Integrated Management Area is located in the southeastern part of the Department of Santa Cruz. It has two management categories and aims to harmonize productive activities with the maintenance of the hydro-biological processes that occur in this portion of the Pantanal, internationally acknowledged as “deep Pantanal”, since it is permanently flooded, more than six months out of the year.

A portion of Otuquis Protected Area’s territory is under Natural Integrated Management Area management category, where natural resources are used sustainably. The area of Otuquis that is under National Park management category is uniquely rich in terms of its flora and fauna, and is under a strict and permanent protection. The only activities allowed are scientific research, ecotourism, environmental education and subsistence use by indigenous communities prior to obtaining a special permit. The use of natural resources and infrastructure development is not allowed within the National Park.

## Pantanal, support for a growing economy

The ecosystem services provided by the Pantanal are essential for human and economic activities. Some of these services are:

- **Climate regulation:** The Pantanal regulates temperature, precipitation and wind patterns, as well as other climate processes in the eastern region of Santa Cruz, and thus has an impact on agricultural and cattle ranching production.
- **Disturbance regulation:** It controls floods, resilience and recuperates the ecosystems after the drought.
- **Regulation of the hydrological cycle:** Due to its capacity in regulating the flow of water, it mitigates extreme climate effects such as droughts and extreme floods. It also contributes in providing continuity to hydrological processes since it is a water evaporating surface, forming clouds which later fall as rain not only in the Pantanal but also in other neighboring ecosystems such as the Chiquitano Dry Forest.
- **Water supply:** The Pantanal captures, stores and regulates the flow of water.
- **Controlling soil fertility loss:** Because the Pantanal is a sedimentation plain, it naturally retains soil and incorporates nutrients through this process and thus produces fertile soil.
- **Water purification:** It recovers and recycles mobile nutrients.
- **Biological control:** It eliminates and decomposes contaminants and toxins from contaminated waters by removing nitrogen and phosphorous, as well as heavy metals.
- **Climate change:** The Pantanal provides at least two critical functions regarding climate change mitigation: first, the process of capturing emissions of greenhouse gasses, and secondly, the physical buffering acting as a shelter in terms of climate change impacts. The Pantanal generously contributes to the capture of carbon from the atmosphere and the liberation of oxygen through photosynthesis.
- **Biodiversity conservation:** The Pantanal shelters an admirable richness in terms of native cultures, flora and fauna.
- **Economy:** The Pantanal provides food, materials water, transportation and recreation. The consumption of its products is of great importance for the survival of rural communities, their hunting and fishing activities for self-consumption.
  la población local.

# Anthropogenic activities and the Pantanal

The wide range of human activities in the Upper Paraguay River Basin and Pantanal affects the maintenance of the hydro-biological processes including its productivity, biodiversity and the environmental services it provides to the regions inhabitants.

As mentioned earlier, the economic potential of southeastern Bolivia is well known and also includes the establishment, in the near future, of an iron and steel industry (through the mining of Mutún) and a thermoelectric plant. This potential, although necessary for economic and social development, could easily have negative impacts on the environment if sustainable development principles and criteria are not considered including mitigation strategies.

Even though the forest conversion rate in the Upper Paraguay River Basin for agriculture and cattle ranching purposes has been low so far (around 2.3% Fuamu, 2006), this could change due to the lack of development planning.

Thus, development needs to occur hand in hand with land tenure clearing processes in order to avoid unplanned human settlements and, of course, ensure necessary mitigation actions so that, for example, the road construction Santa Cruz-Puerto Suárez, which will complete a bi-oceanic Pacific-Atlantic road corridor, truly does bring improvements for the local population, while at the same time mitigating activities such as hunting, that in the long run will greatly deteriorate the quality of this wetland.



© WWF / Viviane VON OVEN

Also, Bolivia has been providing coal, produced from timber extracted from the Chiquitano Dry Forest, to iron and steel industry companies in Brazil. As headwaters for the Pantanal, the forest is strongly linked to both the flooding and fire regimes typical in grasslands.

Habitat conversion for agricultural and cattle ranching purposes or for coal production means that tons of sediments are generated, increasing the normal volume annually dragged by the Pantanal and accelerating sedimentation in lakes, lagoons and other bodies of water. This will contribute to the disappearance of aquatic fauna, a major tourism attraction in the ecoregion due to its high diversity.

The introduction of exotic grasses for pasture lands, such as *Bracchiaria*, has also been harmful to the Pantanal, since there is no pasture management system in the area, which means that it is gaining ground over native species thus changing the composition of the soil and the landscape in general.

The ever increasing economic dynamic of exports produced and transported through the region has raised interest in adapting the Paraguay River to facilitate transportation and to this day continues to be one of the main hopes of the local population and exporters, yet also represents one of the main threats – not just for the Pantanal, but for the whole Upper Paraguay and Paraná river basin systems.

On the other hand, hunting and predatory fishing activities are a permanent threat, promoted by some irresponsible tourism activities and species traffic.

# WWF Bolivia's Pantanal Programme

WWF has been working in the Bolivian Pantanal since 1997 and focuses efforts on maintaining its hydro-biological processes through the sustainable use of natural resources and by supporting initiatives aimed at improving the quality of life of local population.

WWF Bolivia's first contribution in the Pantanal consisted of supporting the work of the Prefecture of Santa Cruz and the Noel Kempff Mercado Museum of Natural History by producing the technical-scientific studies for the creation of the only two national protected areas currently existing in the Bolivian Pantanal: Otuquis and San Matías.

WWF Bolivia's Pantanal Programme currently works under the following four lines of action:

1. Protected areas
2. Species
3. Land use
4. Sustainable production systems



© SEIMON, HALLOY, FRANCO

© FAUNAGUA

## 1. Protected areas

Since 1997 WWF has been supporting both protected areas – Otuquis and San Matías – in both their operational (materials, equipment, infrastructure, services, etc.) and institutional management needs (creation, functioning, Management Council training, staff training, etc.), as well as sustainable productive projects as permitted depending on use and zoning restrictions.

WWF will continue supporting the two protected areas at least until 2009, committed to conserving the headwaters that provide water to the Pantanal, through sustainable natural resources management.

© Willemijn NAGEL

## 1. Species

WWF Bolivia will disseminate information over the next three years aiming to generate conservation strategies for flagship species, such as the Giant river otter (*Pteronura brasiliensis*) and the Hyacinth macaw (*Anodorhynchus hyacinthinus*).

# 1. Land use

In synergy with its work in the two protected areas located in the Bolivian Pantanal, WWF, over the past few years, has generated local capacities through different strategies:

- Strengthening of municipal environmental management capacities through the creation and initial start up for the Local Committees for Economic Development (referred to as Codel in Bolivia) in the municipalities of Puerto Quijarro, Puerto Suárez and San Matías.

- Creation and initial start up for the Association of Pantanal Municipalities, prompted by the association of all three Codels, and subsequently including the municipality of El Carmen Rivero Torres

- Creation and institutionalization of the Environmental and Natural Resources Unit of the Municipality of Puerto Quijarro

WWF will continue working towards promoting an organized and planned development for the region by providing technical information in a timely manner, as well as organizing discussion forums that contribute to adequate decision making for the sustainable development of the ecoregion. Efforts will also continue in terms of municipal environmental management, for which support for the functioning of the Environmental and Natural Resources Unit of the Municipality of Puerto Quijarro will be targeted.

With the same purpose of strengthening local capacities, teachers and educational authorities have jointly elaborated – for the first time in Bolivia – an educational curriculum contextualized to the Pantanal ecoregion, through which elementary level students learn about their environment and its conservation. All this has been achieved within the parameters of the national Educational Reform, which identifies the need of natural sciences to be a transversal in formal education, and it has been validated by the Ministry of Education and the Departmental Service of Education (Seduca) of the Prefecture of Santa Cruz.

For WWF, the follow up on the achievements regarding the implementation of the environmental education curriculum for elementary school level is fundamental, and it is also expected to start an intervention at high school level, based on the lessons learned during the past three years.

© SBDA


© WWF / Gustavo YBARRA

# 1. Sustainable production systems

© WWF-Canon / Michel GUNTHER

© WWF / Gustavo YBARRA

This line of action promotes – through sustainable practices – the improvement of productive and/or commercial activities and, consequently, the quality of life of the local inhabitants. A good example of this is the fishing management, whose results can be seen in a solid fishermen's cooperative with its self-management capacity and which has developed a fishing management plan to ensure the sustainability of its activities. In addition, this management plan accompanies the new fishing policies that are being proponed at the departmental and national level, ensuring the consideration of regional aspects and thus the possibility of better decision making.

Since cattle ranching is one of the most important economic activities in the ecoregion, the dissemination of technical information regarding its sustainability has been considered important. Roughly 100 individuals from 20 communities from the Ángel Sandoval Province have been benefited from this information, and, during the past 3 years, 57 people have been trained as cattle ranching operators.

Aware that tourism represents an important potential for the Pantanal region, WWF supported the development of municipal tourism strategies in Puerto Quijarro, Puerto Suárez and San Matías, beginning with the identification of local attractions as well as orienting the priority areas to be developed. In addition, training and awareness have also been implemented regarding the subject.

During 2007-2009, WWF will continue supporting fishing and hydro-biological resources management, such as those aimed at the Caiman (*Caiman crocodilus yacare*). Based on a diagnosis of opportunities and feasibility, sustainable cattle ranching practices will continue to be promoted, as well as the development of sustainable tourism, considering these actions that contribute to appreciating the natural landscape while at the same time providing support to economic activities through environmentally friendly practices.

Using radio jingles, TV spots and various graphic materials, all four lines of action will be supported by the campaign "Pantanal is life", which will contribute to the knowledge and appreciation of the Pantanal with special emphasis on protected areas


WWF Bolivia develops its activities in collaboration with local organizations as well as with help from national research, training and development organizations.

**National partner institutions of WWF Bolivia within its Pantanal Programme (1997 – 2006)**

Armonía Association
Proceso Educational Services
Noel Kempff Mercado Museum's Friends Foundation (Fuamu)
Noel Kempff Mercado Natural History Museum
Center for Participation and Sustainable Human Development (Cepad)
Organization for the Management of the Tourism Destination Santa Cruz (OGD)
Bolivian Environmental Law Society (SBDA)
Faunagua Association
Infocal Foundation Santa Cruz
National Protected Areas Service (Sernap) - San Matías Protected Area
National Protected Areas Service (Sernap) - Otuquis Protected Area

Municipal Government of Puerto Suárez
Municipal Government of Puerto Quijarro
Municipal Government of San Matías
Association of Pantanal Municipalities

Considering the numerous conservation and sustainable development needs of the ecoregion, WWF Bolivia and WWF Brazil jointly coordinate efforts in the Pantanal. This also allows to maximize resources so that ecoregional goals can be achieved through an integrated management vision of the world's largest tropical wetland: the Pantanal.

Edition: WWF Bolivia • Production: Barbián Comunicación • June 2007

**WWF**
**The global conservation organization**
WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature by:

- Conserving the world's biological diversity
- Ensuring that the use of renewable natural resources is sustainable
- Promoting the reduction of pollution and wasteful consumption.

WWF Bolivia's Pantanal Programme is supported by WWF Netherlands and WWF Switzerland for the implementation of proposed activities until 2009.

**WWF Bolivia**
Calle Los Pitones Nº 2070
(Av. Beni, entre 2do. y 3er. anillo)
Santa Cruz, Bolivia
Tel.: +591-3-3430609
Fax: +591-3-3430406
wwfbolivia@wwfbolivia.org
www.panda.org/bolivia