

Information Sheet on Ramsar Wetlands

1. Date this sheet was completed/updated: 28 September 2001

2. Country: Bolivia

3. Name of wetland: Laguna Concepción

4. Geographical coordinates:

17° 31' South latitude
61° 21' West longitude

5. Altitude: 255 metres above sea level

6. Area: 31,124 hectares

7. Overview: Laguna Concepción represents the wetlands of the Gran Chaco and is characterized by lowland of woodlands and matorrales, associated with soils with deficient drainage. It is a large body of water of approximately 6,179 hectares and is surrounded by palm groves of *Copernicia alba* and *Typha dominguensis*. The lake is one of the most important bodies of water in the entire eastern part of the department of Santa Cruz, being very important as a wintering habitat for migratory birds from both the north and south and providing water to large populations of wildlife. PRIME et al. (2000) emphasized the lake as an aquatic habitat at the international level, in addition to being an excellent example of the wetlands exclusive to the Chaco biogeographic region.

8. Wetland type: Inland N, O, P and Ts

Types of wetlands by decreasing order of importance: O, P, Ts, Tp, N, Xf and W

9. Ramsar criteria: 1, 2, 4, 5 and 8

Criteria that best characterize the site: 1

10. Map of site included? Please tick yes -or- no

11. Name and address of the compiler of this form:

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12. Justification of the criteria selected under point 9, on previous page:

Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region. Laguna Concepción represents the wetlands of the Gran Chaco and is characterized by a flatland of woodlands and matorrales associated with soils with deficient drainage. The area of the Chaco is formed by surrounding regions of alluvial fans where there are marsh areas crossed by former fluvial strips of the Río Parapetí and the Río Grande. In general, the Chaco wetlands are xeric environments formed by dispersed points of water (PRIME et al., 2000).

This is the only wetland in the eastern part of the department of Santa Cruz and is a very important habitat for local fauna and plays a key role in the biology of many species of mammals, birds, amphibians, reptiles and fish. The large species of mammals such as the lowland tapir (*anta*) (*Tapirus terrestris*), taitetú (*Tayassu tajacu*), white-lipped peccary (*puerco de monte*) (*Tayassu pecari*) and jaguar (*Panthera onca*) are usually found in the area in the dry season as well as large concentrations of yacare caiman (*Caiman yacare*) and many recorded species of birds.

Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities. Current knowledge of the fauna of Laguna Concepción is still superficial. Nonetheless, it is established that the area sustains large populations of several large mammals (PRIME et al., 2000). Large populations of the following bird species, mammals and reptiles are considered endangered by IUCN (2000) recorded in the wetland and the surrounding area.

Blastocerus dichotomus (*ciervo de los pantanos*) marsh deer. This species is considered by IUCN (2000) as vulnerable and is rarely found near the marshes around the lake.

Catagonus wagneri (*chancho solitario*) Chacoan peccary. This species is listed as endangered by IUCN (2000). The species is occasionally seen in the southern part of the lake and is endemic to the Chaco biogeographic region.

Chrysocyon brachyurus (*borochi*) maned wolf. This species is also considered by IUCN (2000) to be at low risk and is very rarely found in this area.

Panthera onca jaguar. Listed in the low risk category of IUCN (2000). The species is common in this area and is considered by the local inhabitants to be the most harmful animal because it attacks cattle.

Priodontes maximus (*pejichi*) giant armadillo. This species is not frequently sighted in the area but is subjected to heavy pressure from hunting by the local inhabitants. It is included in the endangered category by IUCN (2000).

Rhea americana (*piyo*) common rhea. This species is considered vulnerable by IUCN (2000). It is very common and abundant throughout the area of the lake. It is subject to heavy extraction of eggs in the area.

Speothos venaticus (*perrito de monte*). This species is found occasionally by local inhabitants and is considered by IUCN (2000) as vulnerable.

Tapirus terrestris (*anta*) This species is listed in the low risk category by IUCN (2000). This species is very common around the lake and is important as the object of subsistence hunting for the local inhabitants.

Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions. Being the only wetland in the entire department of Santa Cruz, this is an important place for local fauna, and it plays a key role in the biology of many species of mammals, birds, reptiles, amphibians and fish. Large mammal species such as the *anta* (*Tapirus terrestris*), *taitetú* (*Tayassu tajacu*), *puerco del monte* (*Tayassu pecari*) and jaguar (*Panthera onca*) are found frequently in the surrounding area in the dry season as well as large concentrations of yacare caiman (*Caiman yacare*) and many species of recorded birds.

Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterfowl. A study is currently being carried out on the importance of the lake for migration of waterfowl, based on an analysis of the diversity and abundance of these species. Partial results show the importance of the lake for thousands of aquatic birds, because the lake is the only important body of water in the eastern part of the department of Santa Cruz. It is the habitat of large concentrations of birds throughout the dry and wet periods. Large concentrations of species of birds in several families such as Anhimidae, Anatidae, Jacanidae and Scolopacidae, which use the lake as a wintering, breeding and feeding site or as the most important stopover on their intercontinental migrations. This wetland sustains more than 20,000 aquatic birds per year.

Criterion 8: A wetland should be considered internationally important if it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend. All the surrounding area, including palm groves, are flooded in the wet season, which is essential for the biological cycles of many species of fish that depend on marked seasons of water level. This makes more space and food available and, therefore, more area for the growth of the young fish. The lake also acts as a corridor or migratory route for species because two large rivers join here: the Parapetí and the San Juan, which are joined through the Bañados del Izozog with Laguna Concepción, playing a very important role in the genetic variability of the fish.

So far, the ichthiofauna in the lake has been little studied. Only 12 species have been identified in eight families. Of these, the *pez pulmonado* (*Lepidosiren paradoxa*) and the Rivulidae family are of interest because of its physiological adaptations to seasonal bodies of water.

13. General location:

Laguna Concepción is located in the north-eastern part of the province of Chiquitos in the department of Santa Cruz. The closest town is El Cerro (municipio of Pailón, province of Chiquitos, department of Santa Cruz) with about 35 families. But the

nearest town with a larger number of inhabitants is San José de Chiquitos with 10,000 inhabitants.

14. Physical features:

The area of Laguna Concepción is representative of the Gran Chaco wetland and is characterized by a wooded plain and matorrales associated with poorly drained soils. The area of the Chaco is formed by surrounding regions of alluvial fans where there are marshes crossed by old branches of the Río Parapetí and Río Grande. The system of Chaco wetlands is xeric environments formed by dispersed points of water (PRIME et al. 2000).

Laguna Concepción is located within the complex of Chiquitana Hills. This geological and geomorphologic structure makes up a long chain of hills of varying elevation and width that extends from Laguna Concepción northwest up to Pozo del Tigre. It is a chain of lower and lower hills until disappearing among low aligned hills with smooth slopes. Geologically, these hills are formed by rocks from the Cambrian, Devonian, Silurian and Ventanas from the pre-Cambrian with lateritic sediments from the Tertiary (PRIME et al., 2000). The climate is characterized by marked seasonality with a dry season that corresponds to the southern winter with an average annual precipitation between 500 and 800 millimetres and an average annual temperature between 25° and 26° C (PRIME et al., cited by Montes de Oca, 1998).

The lake is connected in the extreme north with the Bañados del Izozog through Río Quimones. These marshes have been characterized by several geographers as being the connexion between the Amazon and Parana basins. PRIME et al. (2000) declares that the lake has a sandy substratum with many rocks on the shore and aquatic macrophytes. The colour of the water is dirt-coloured coffee with good oxygenation and rather hard. The current depth of the lake is 1.20 metres throughout the lake.

15. Hydrological values:

According to PRIME et al. (2000), the lake belongs to the sub basin of the Mamoré, receiving water from the Parapetí during the dry season through Bañados del Izozog and represents one of the most important bodies of water in the entire eastern part of Santa Cruz.

Little is known about the hydrology of the lake, but according to Don Delmiro Suárez, owner of the Santa Fe ranch and having lived in the area for more than 50 years, the water in the lake comes from north of San José de Chiquitos, part from near San Rafael de Chiquitos and the rest from San Miguel. These rivers join at a place called La Placa where four rivers join: Quimones, San Jerónimo, Santa María and Tusanoma. These four rivers join and form the Tusabó, which is the tributary to the lake. Once the lake is full, water exits through the same place and forms the Río San Miguel, which today is called the San Julián. This water empties into the Río San Pablo near Guarayos and lower downstream forms the Río Itonama, which in turn empties into Río Itenez.

16. Ecological features:

According to field observations and the literature, Laguna Concepción has the following plant associations.

Transitional Chiquitano woodlands – This is found throughout the southern part of the lake and corresponds to the San José Hills. It has sandy, rocky soils at the base of the hills with an almost continuous canopy between 12 and 15 metres in height with few emergent trees and a shrub undergrowth of moderate density. This forest is characterized by *Acosmium cardenasii*, *Anadenanthera colubrine*, *Anisacantus boliviensis*, *Astronium urundeuva* and *Phyllostylon rhamnoides*.

Seasonally flooded Chaco woodlands – This forest has a canopy of low crowns between 3 and 5 metres, altered by cattle or fire. It is characterized by *Capparis retusa*, *Coccoloba paraguariensis*, *Geoffroea striolata*, *Machaonia brasiliensis*, *Parkinsonia aculeate* and *Tabebuia nodosa*. Repeated burning and the grazing of cattle have created the flooded herbaceous pampas, which are characterized by *Capparis retusa*, *Copernicia alba*, *Prosopis ruscifolia*, *Tabebuia nodosa* and the grass *Leersia hexandra*. The soils are slightly clay, and this is the area where most of the cattle ranches are found.

Shrub matorral – This is formed by *Baillonia amabilis*, *Ipomoea carnea fusulosa*, *Mimosa chaetosphaera* and *Parkinsonia aculeate*. It forms a small strip around the lake and is subject to heavy nitrification because of the presence of cattle.

Complex of palm marshes and aquatic vegetation – The aquatic vegetation surrounds the lake from the water towards the edges and is formed primarily by *Eichhornia crassipes*, Lemnaceae, *Pistia stratiotes* and *Salvinia* spp., which form part of the association of Pleustophytes. After that, there is another association of helophytic reeds of *Leersia hexandra* and *Paspalidium geminatum*. These communities are usually dominated by *yomomo* or *colcha flotante* at different depths, from 20 centimetres until more than a metre in depth. The water is dark with a large amount of organic material in decomposition. *Typha domingensis* and the ferns *Pityrogramma calomelanos* and *Thelypteris interrupta* form part of the helophytic reed community that grows in the marsh area of the lake on nitrogen-heavy soils considerably altered by cattle and submitted to frequent burning.

Seasonally flooded woodland-palm grove – This forms a ring around the lake and expands towards the herbaceous pampas of poorly drained soils. The ring of palms has clay soils with humus and nitrogen because of heavy grazing. It is characterized by *Copernicia alba*, accompanied by *Ipomoea carnea* and *Typha domingensis*.

Chaco woodland of poorly drained soils – This association is located in the north-western and southern parts of the lake. It grows on fine-textured clay soils characterized by *Acacia praecox*, *Aspidosperma triturate*, *Bulnesia sarmientoi*, *Diplokeleba floribunda*, *Ruprechtia triflora* and the palm *Trithrinax schizophylla* toward the west.

Chaco woodland on moderately drained soils – This association borders the peninsula, northwest of the lake interspersed with the Chaco woodland of poorly drained soils. It is characterized by *Aspidosperma quebracho-blanco*.

Riparian hydrophilic woodland – On the shores of Río Quimomé, this type of woodland does not flood like the others because it is on a sort of dyke characterized by *Maclura tinctori*, *Melicocca lepidopetala*, *Sapindus saponaria* and *Sorocea sprucei*.

Riparian Chaco woodland – In the woodland that is flooded by flowing water, there are other species such as *Albizia inundata*, *Banara arguta*, *Combretum lanceolatum* and *Crataeva tapia*.

17. Noteworthy flora:

The main plant species in the area belong to the following communities:

In the communities of aquatic vegetation, there are the following species: *Typha domingensis* and the ferns *Eichhornia crassipes*, *Pityrogramma calomelanos* and *Thelypteris interrupta*. The palm groves of *Copernicia alba*, typical of the Chaco biogeographic region, are very disturbed, because they are cut for several purposes. The Chaco forest is in good conservation status on poorly drained soils with specimens of *Trithrinax schizophylla* and *Bulnesia sarmientoii*. The presence of *Byttneria fontis* in the lake is a new listing for this recently discovered species, considered to be endemic to this region. Other important forest species in the area are the *roble* (*Amburana cearensis*), *curupaú* (*Anadenanthera colubrina*) and *cuchi* (*Astronium urundeuva*), which belong to the transitional chiquitano forest, plus *Aspidosperma quebracho-blanco* from the Chaco forest of moderately drained soils and the *guayacán* (*Bulnesia sarmientoii*) from the poorly drained Chaco forest. *Acosmium cardenasii*, commonly called *tasaá*, is considered endemic to the Chiquitano forest.

18. Outstanding fauna

According to PRIME et al. (2000), Laguna Concepción and the surrounding palm groves concentrate a large number of species of mammals; 42 species having been recorded so far. Among the most important species are *Alouatta caraya*, *Blastocercus dichotomus*, *Callithrix argentata*, *Hydrochaeris hydrochaeris*, *Panthera onca*, *Priodontes maximus*, *Puma concolor*, bush dog (*Speothos venaticus*) and *Tapirus terrestris*. There are 37 species reptiles in the area, of which 12 are amphibians and 25 reptiles. Among these species, several are important because they are used by the local inhabitants; for example, the tegu lizards (*peni*) (*Tupinambis* sp.), the yacare caiman (*Caiman yacare*) and the turtle (*Geochelone carbonaria*) (PRIME et al., 2000).

The fish fauna in the lake has been poorly studied. Only 12 species have been registered in eight families and four orders. The most common families are Characidae, Gymnotidae, Lebiasinidae and Pimelodidae, among others.

The most important bird species at the site are the aquatic birds of which 37 species have been recorded until now. The following species stand out because of their large numbers: *tapacaré* (*Chauna torquata*), *gallareta* (*Jacana jacana*) and *tibibi* (*Calidris melanotos*). There are several species of ducks, including *Amazonetta brasiliensis*,

Cairina moschata, *Dendrocygna autumnalis* and *Sarkidiornis melanotos*. There are large populations of parrots and pigeons of more than 600 specimens.

As for mammals, the lake has a diverse and abundant large fauna. Special mention should be made of the *anta* (*Tapirus terrestris*), jaguar (*Panthera onca*) and three species of *chanchos de monte*. The most abundant is the *Tayassu pecari*.

19. Social and cultural values:

All this land was formerly occupied by indigenous peoples, both Chiquitanos and Ayoreodes, who practiced a system of exploitation of resources as nomads practicing hunting and gathering. The area is now occupied by private owners, ranchers who practice extensive grazing of cattle, and by Indians and small farmers who carry out the same activity. The lake represents one of the most important bodies of water in the entire eastern part of Santa Cruz. North of the last hills of the Chiquitos Hills, there are archaeological sites.

20. Land tenure/ownership of:

All the area of influence of the lake is occupied by private owners, Indians and small farmers. But eight kilometres away, there is a community of Mennonites that practice agriculture.

21. Current land use:

The area is completely occupied by cattle ranches for extensive grazing of cattle, using the lake as a natural source of water for cattle and the local inhabitants around the lake.

22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects:

Extensive grazing: Within the area of the lake there are about 20 cattle ranches with an approximate total of 7900 head of cattle. The most frequent breed is Nelore, because it is best adapted to the local conditions and the type of extensive ranching practiced in the area. All meat production is sold in the cities of Santa Cruz and Pailón. Goats, pigs and chickens are also raised, but for domestic consumption. Grass is burned in August and September. The natural grasses are commonly called *arrocillo* and grow among the palm groves. There are also cultivated pastures such as *braquiaria*, *estrella africana* and *colonión*, among others. The reed beds are burned like the grass, because the shoots of bulrush are an excellent fodder for the cows when grass is scarce.

Subsistence hunting: Perhaps fish do not play an important role in the diet of the local inhabitants because as pointed out only a few ranches have direct access to the lake. Furthermore, there are no records of large fish, although there is a relative abundance of small fish such as piranhas (*Serrasalminidae*) and *benton* (*Hoplias malabaricus*). The Mennonites are the only persons to fish intensively in the lake. They use nets and motor boats.

Several decades ago, there was heavy hunting of crocodiles and snakes in the Boidae family because the skin of these animals had a high economic value. Today, there is no longer that trade, but if they are occasionally hunted either for food, the case of the yacare caiman (*Caiman yacare*) and turtles (*Chelonoidea* sp.) or the large snakes (*Boa constrictor* and *Eunectes notaeus*), it is because they are considered harmful because they eat domestic animals.

As for birds, they are mostly hunted occasionally, and birds are very seldom used in the diet of the local inhabitants. The Muscovy duck (*pato negro*) (*Cairina moschata*) and *putiris* (*Dendrocygna* sp.) are hunted when they are found. That is the case of the turkey (*mutún*) (*Crax fasciolata*) and the *charata* (*Ortalis canicollis*). The *piyo* (*Rhea americana*) is not subject to hunting because its meat is not edible for the local inhabitants, but their eggs are gathered whenever a nest is found.

Mammals suffer the heaviest pressure from hunting within the study area. The *tatu* (*Dasyopus novemcinctus*) has the highest rate of capture followed by the *corechi* (*Tolypeutes matacus*) and the *urina* (*Mazama gouazubira*). Also worthy of mention are the *guazo* (*Mazama americana*), *anta* (*Tapirus terrestris*), *jochi pintao* (*Agouti paca*), *tejón* (*Nasua nasua*) and the *puercos de monte*. The *taitetú* (*Tayassu tajacu*) and the *puerco de tropa* (*Tayassu pecari*) are also hunted regularly.

The only felines that are hunted down because they are “harmful” are the two largest cats: the jaguar (*Panthera onca*) and the puma (*Puma concolor*), although several years ago all cats were intensely hunted in the area in order to sell their skins because of the high prices paid in the city of Santa Cruz.

Extraction of wood and palms: At the present time, the extraction of fire wood from Cerro Concepción and the area around the lake is insignificant, because it is cut only for local construction of houses and fences. The species most frequently used are the *cuchi* (*Astronium urundeuva*), *roble* (*Amvurana cearensis*) and *curupaú* (*Anadenathera colubrine*). Palms are most widely used as fence posts for corrals, construction of houses both for walls and roofs. The palm *Copernicia alba*, which reaches heights of between 8 and 10 metres, is traded and was formerly traded extensively. These palms are used for street lighting by the electric companies because the mature palms last 10 to 15 years.

Extensive agriculture: The Mennonite colonies are located only eight kilometres from Laguna Concepción. If agriculture continues to expand in the area, a very serious problem will be created and will lead to drastic changes in the functioning of the lake, because the water will be used for irrigation.

23. Conservation measures taken:

No conservation measures have been taken, and the area is being heavily impacted by cattle grazing in the area.

24. Conservation measures proposed but not yet implemented:

Listing of the wetland is an attempt to establish conservation measures for Laguna Concepción. The indigenous peoples are also attempting to protect the area.

25. Current scientific research and facilities:

Currently, two research projects are working in the area on the importance of Laguna Concepción for regional bird life and the migration of waterfowl and a study of the vegetation of Laguna Concepción and the surrounding area. The only infrastructure is the cattle ranches where water and food can be obtained.

26. Current conservation education: There are no educational programmes at the site.

27. Current recreation and tourism:

There are no tourist or recreational activities, but there are plans for tourist projects by the municipalities of Pailón and San José de Chiquitos for implementation in the area. These projects have not gone beyond the discussion stage with nothing concrete at the present.

28. Jurisdiction:

The territorial hierarchy at the site is:

The Government of Bolivia
The office of the mayor of Pailón
The municipality of Pailón

29. Management authority:

The institution responsible for Laguna Concepción is the municipality of Pailón.

30. References: