

Information Sheet on Ramsar Wetlands

1. Date this sheet was completed/updated: February 2002
2. Country: Argentina
3. Name of wetland: Bañados del Río Dulce and Laguna de Mar Chiquita
4. Geographical coordinates:

29° 48' - 30° 59' South latitude
(5 kilometres north of Villa Candelaria on the Córdoba-Santiago del Estero border)
(4 kilometres south of Provincial highway 17 on the Río Segundo (Río Xanaes))

62° 10' - 63° 23' West longitude
(on the Córdoba-Santiago del Estero border)
(Villa Rosario del Saladillo)

5. Altitude: 70.63 metres above sea level (current water level)
6. Area: approximately 996,000 HECTARES
7. Overview:

This lacustrine-fluvial depression includes Laguna de Mar Chiquita (Mar de Ansenusa), Bañados del Río Dulce (Río Petri), the mouths of Río Primero (Suquía), Río Segundo (Xanaes) and other streams. It forms a wide concavity bordered by deep north-south faults and receives water from the above rivers, in whose lower reaches is located Mar Chiquita with water that varies between medium-saline and hyper-saline. It is the largest and most important endorheic basin in Argentina and, of course, in the province of Córdoba. There is an important number and diversity of species of waterfowl and other animals, and this wetland supports these populations during critical periods of their life cycles (especially hemispheric migrations). There are also shrub and arboreal species with medicinal, alimentary and industrial properties that are unexploited. The system is cyclical. During wet periods, the microclimate that creates the body of water is fundamental for an important productive area of Argentina.

8. Wetland type: M, N, O, Q, R, Sp, Ss, Tp and Ts

Types of wetlands by decreasing order of importance: Q, R, O, Ss, Sp, Tp, Ts, M and N

9. Ramsar criteria: 1, 2, 3, 4, 5, 6, 7 and 8

Criteria that best characterize the site: 5

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

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

Agencia Córdoba Ambiente Sociedad del Estado
Avenida Richieri 2350
5000 Córdoba
Argentina

Nestor Bárbaro Director

Tel.: (54 351) 434 3310-12/3475
E-mail: agenciacordobaambiente@cba.gov.ar
www.medioambiente.gov.ar

Hector Acuña
Mariana Carnero
Italo Chini
Guillermo Fernández
Miguel A. Herrera
Raúl Lasso
José Tassile
Bernardo Sonzini
Javier Closa

The staff of the Mar Chiquita and Bañados del Río Dulce Reserve
Park warden Sixto Ferreyra
Park warden Pablo Michelutti
Park warden Fabián Rostagno
Park warden María Santucho
Park warden Julio Vallejos
Ana Villarroya (gathering of data and typing)

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

The Bañados del Río Dulce (Río Petri) in the province of Cordoba lie between the northern provincial border and Mar Chiquita between 29° 48' and 30° 35' South latitude and between 62° 30' and 63° 16' West longitude, covering an area of approximately 390,900 hectares. It is important to point out that these wetlands also extend into the province of Santiago del Estero. They form the floodplain of Río Dulce, which is the main tributary of Mar Chiquita and the system of marshes located in the depression.

The depression of Mar Chiquita is located between 30° 20' and 30° 57' South latitude and 62° 12' and 63° 05' West longitude, covering an area of approximately 800,000 hectares.

Criterion 1: Most of the area of the proposed wetland is occupied by Mar Chiquita, one of the largest saline lakes in the world, with large variations in volume and salinity in long seasonal cycles. It is the base level for the largest endorheic basin in

Argentina with extremely high chloride-sodium saline water that has ranged in this century between 24.8 and 360.3 grams/litre.

The high variability in the flow of the main tributary, Río Dulce (zero to more than 2000 cubic metres/second) leads to the formation of lakes and permanently flooded areas and large seasonal and intermittent areas during periods of flooding. During the dry season, many of these wetlands lose contact with the main body of water and increase their salinity through evaporation (wetlands of type O, Ss, Sp, Tp and Ts). The tributaries of Laguna de Mar Chiquita on its southern shore (Suquía and Xanaes rivers and Arroyo Saladillo) are M and N type wetlands although in the area of influence of Mar Chiquita they form deltas or other types of wetlands. All the tributaries are partially regulated by engineering works for irrigation and generation of electricity. For this reason, the hydrological regime of the wetlands, especially during dry years, has suffered some degree of man-made modification.

Because of its large area and its regime of fluctuation, Mar Chiquita can be considered rare or unique at the level of the continent. The other types of wetlands at the proposed site are common and representative of the wide floodplains and the type of rivers that characterize the Chaco region (Canevari et al., 1998). The authors cited consider the floodplains of Río Dulce and Mar Chiquita as one of the most important wetlands of the Chaco and all of Argentina with an enormous wealth of biodiversity in the gradient from freshwater to very saline water.

Within the Neotropical region, the area of Mar Chiquita and Bañados del Río Dulce is included in the system of "Chaco complex" ecoregions (Olsen et al., 1998), and it is classified as regionally important because of its biological distinctiveness. Its conservation status is vulnerable and is a priority at the regional scale for conservation activities.

Criterion 2: Vulnerable species of waterfowl: *parina grande* (*Phoenicopterus andinus*), *parina chica* (*P. jamesi*), *burrito overo* (*Porzana spiloptera*) *gaviota cangrejera* (*Larus atlanticus*) and *burrito enano* (*Coturnicops notata*), for which sufficient classification data is lacking.

Criterion 3: The proposed area has a very high percentages of aquatic birds recognized in the province of Cordoba: two species typical of high-Andean aquatic bird life and six species that outside of this area are found only on marine coasts (*Arenaria interpres*, *Calidris canutus*, *C. pusilla*, *Larus atlanticus*, *Sterna hirundo* and *Stercorarius parasiticus*).

Criterion 4: At least 30 species of waterfowl nest in the area. About 24 species are migrants from the northern hemisphere. Many of them are very abundant, are recorded here regularly or can be observed year round.

Criterion 5: The number of aquatic birds that regularly concentrate in the area is clearly more than that fixed by the Convention. At only one site, more than 100,000 specimens were recorded in 1998. Species represented by more than 20,000 specimens include *Egretta thula* (400,000), *Phalaropus tricolor* (200,000), *Phalacrocorax olivaceus* (42,000), *Bulbulcus ibis* (60,000) and *Plegadis chihi* (400,000).

Criterion 6: At least four species of waterfowl fulfil the criterion of one per cent of its population recorded in the Río Dulce and on the shores of Mar Chiquita wetlands: *biguá* (*Phalacrocorax olivaceus*), *garcita bueyera* (*Bubulcus ibis*), *cuervillo de cañada* (*Plegadis chihi*) and the common flamingo (*Phoenicopterus chilensis*).

Criterion 7: The area of Bañados del Río Dulce has 31 species of fish. In recent studies, a new method of sport fishing for one species was identified. Another six species are important for sport fishing and for human consumption and in this area reach their greatest densities of population in central Argentina. The other two main tributaries of the lake (the Suquía and Xanaes rivers) have approximately 20 species each, among which there is one endemic species.

Criterion 8: The area of Bañados del Río Dulce functions as a breeding area for at least 27 species of fish. In addition, it is an important stage in the migration of migratory species such as *Prochilodus platensis* and *Salminus maxillosus*.

13. General location:

This wetland is located in the north-eastern part of the province of Córdoba in the departments of Río Seco and Tulumba the northern part of the department of Río Primero and the north-central part of the department of San Justo. The site borders on the north with the province of Santiago del Estero. Near its eastern border are the towns of Brinkmann, La Paquita and Morteros. The towns near the southern border are (from west to east) Obispo Trejo, La Puerta, Las Saladas, Villa Fontana, La Para, Marull, Miramar, Balnearia, Altos de Chipión and La Paquita. To the west, the towns that are along the road that is its limit are Villa Rosario del Saladillo, Puesto de Castro and Villa Candelaria. In the Bañados del Río Dulce, there is the town of La Rinconada. This wetland is the lowest part of an endorheic basin that includes part of the provinces of Córdoba, Santiago del Estero, Tucumán and Salta. It is located 150 kilometres northeast of the city of Córdoba, which with a population of 1,300,000 inhabitants is the capital of the province of Córdoba. Only one town is located on the shores of the lake, Miramar, with 2164 inhabitants (1995 census).

14. Physical features:

This wetland includes the bottom of the largest inland basin in Argentina with a lake of tectonic origin from the post-Pliocene. The large wetland system that forms the end of Río Dulce includes two large subsystems: the floodplain of Río Dulce with an average annual flow of 2996 cubic hectometres and a basin (the Salí-Hondo-Dulce system) that altogether has an area of more than 54,000 square kilometres. The upper part is formed by parts of the basin in the provinces of Catamarca, Salta and Tucumán. With an average annual precipitation of 800 millimetres, it can be considered a humid climate.

The lower part has different characteristics than the upper. It is a flatland fluvial system with many unstable and ephemeral branches and many pools. Río Dulce is regulated by the Río Hondo Dam, which separates the upper and lower parts. Rainfall in the lower region is different from the upper because it has an annual average of approximately 600 millimetres and it is classified as a semiarid climate.

Flow in Río Dulce from September 1977 to March 1978 was 90.7 cubic metres/second with a maximum of 226 cubic metres/second and a minimum of 2.7 cubic metres/second. The Río Dulce floodplain is the equivalent of a large delta with a very small slope and with a very large range of salinity. Its dynamics are conditioned and determined basically by the magnitude and frequency of the periodical flooding created by the contribution of Río Dulce. The frequency, intensity and duration of flooding determine the pattern of the hydrological network, deposition, stirring-up of sediments and composition of the vegetation.

The rhythm of flooding constitutes the most dynamic basic factor for maintaining heterogeneity of the vegetation and the associated fauna. As a result, preservation of the flood regime is a basic prerequisite for its conservation. The other rivers that flow into Laguna de Mar Chiquita are Río Primero (Río Suquía) and Río Segundo (Río Xanaes). Total annual flooding is 725 cubic hectometres, and its watershed has an area of 7500 square kilometres and 12,700 square kilometres respectively. Both are completely within the province of Córdoba. Río Primero has a volume of 9.7 cubic metres/second with a maximum of 24 cubic metres/second and a minimum of 2.0 cubic metres/second, while Río Segundo (Río Xanaes) has a volume of 12.2 cubic metres/second with a maximum of 34.7 cubic metres/second and a minimum of 3.0 cubic metres/second.

Rainfall in the area formed by the lake and its floodplains has been calculated from information provided by 45 rain gages located in the provinces of Santiago del Estero, Santa Fe and Córdoba near the lake and its floodplains. The average of minimum semestral cycles is 65.4 millimetres and that of maximum semesters is 876.02 millimetres.

Evaporation and evapotranspiration have been calculated from data for June 1972 of lake level at 64.05 metres above sea level and in September 1986 of 71.21 metres above sea level, which means a water surface of 1197 square kilometres and 7250 square kilometres respectively.

The average salinity in the lake ranges between the extremes of 30 grams/litre in 1986 and 270 grams/litre in 1968.

In summary, the Bañados del Río Dulce-Mar Chiquita are characterized by great seasonal variation in water contributions associated with variations in the intensity of rainfall recorded in the basin. This creates short-term variations from year to year and long-term variations of high and low water. This leads to large oscillations in the flooding of Río Dulce and in the water level of Laguna de Mar Chiquita. During the past thirty years, there have been very dry years in which there has been no runoff until the current very wet years, which began at the end of the 1970s and which have led to an unusually large increase in the lake's water level.

The existence of dry, wet and very wet years is a natural phenomenon without water being taken from the system.

15. Hydrological values:

The lake, as the bottom of the basin, is the site of discharge of regional aquifers and receives salts and sediments transported by several convergent hydrological currents. The Bañados del Río Dulce is of great importance in the regional discharge and local recharging with freshwater rain and river water, flood control, and capturing and retention of sediments. The current level of the lake creates problems of coastal stabilization and permanent flooding of areas that were subject to seasonal variations.

16. Ecological features:

The Bañados del Río Dulce is covered with fine fluvial sediment from overflowing of Río Dulce in the recent past. Locally, a strip of transition, lowlands subject to flooding and saline-alkaline plains have been identified. Constant changes in water level together with variations in salinity define a regime of changes with direct influence on the distribution patterns of plants. Where flooding has no influence, on the higher sites in the basin low native matorrales grow on the eastern plain with emergent islands of *chañar* and thistle and more sporadically several trees. In saline soils that do not retain water for a long time, there are low halophytic matorrales and succulent shrubs. At saline sites, subject to more or less short shallow flooding there are *espartillares*. In the area of meanders of Río Dulce, there are large grasslands, which are important as support for a local economy of transhumance grazing.

The aquatic environments include lotic systems in areas of establish riverbeds: rivers and streams with their mouths (deltaic and estuarine systems) in Río Dulce is a small part, the rest is in the province of Santiago del Estero, Río Segundo and more recently Brazo Pujuntas. Also included are the lacustrine lentic systems of Laguna de Mar Chiquita, which occupies the lower part of the depression. As a result of fluctuations in water level, plant cover is reduced in this area. The vegetation is composed of several ephemeral grasses and several isolated halophile shrubs. On the edges of the area, there are three distinct well-defined regions. To the west, there is the predominantly aeolian flatland of the Chaco Plains with woodlands of between 12 and 20 metres high with a dominance of quebrachos, which are being displaced by forests mixed with algarrobos. To the southwest and south, there is a flat loess pampa flooded by Río Primero and Río Segundo. The original vegetation was composed of xerophytic woodlands dominated by *quebracho blanco*, which has been almost completely cut down for farming. To the east, the loessic pampa of Altos de Morteros, which, although its area is reduced, stands out from the surrounding relief growing down into the depression of Mar Chiquita, part of Espinal, a phytogeographical province dominated by the genus *Prosopis* (*algarrobos* and *ñandubay*).

17. Noteworthy flora:

In the Bañados del Río Dulce, the emergent vegetation is *Baccharis juncea*, *Scirpus californicus*, *S. americanus* and *Typha latifolia*, among the larger species. In grasslands and pastures of species of greatest biomass, are found *Cynodon dactylon*, *Distichlis spicata*, *Paspalum vaginatum* and *Salicornia ambigua*. The shrubs are composed of *Allenrolfea patagonica*, *A. vaginata*, *Atriplex* spp., *Cyclopsis genistoides* and *Maytenus vitis-idaea*, among the most frequent species. Outside the areas subject to flooding, the native vegetation is composed of low, open xenophile

thorny woodlands, varying according to local conditions, with *algarrobos* (*Prosopis* spp.), *quebracho blanco* (*Aspidosperma quebracho-blanco*), *chañar* (*Geoffroea decorticans*), *tala* (*Celtis* sp.), *mistol* (*Zizyphus mistol*) and *tusca* (*Acacia aroma*) among the most frequent and largest species. The species and plant associations studied are abundant and spread out in saline and flooded environments of central Argentina. The borders of the proposed area, especially the areas with Chaco wooded vegetation, are the home to several scarce local species, such as *quebracho colorado santiagueño* (*Schinopsis lorentzii*), *barba de tigre* (*Prosopis kuntzei*), *palma* (*Trithrinax campestris*) and *passionaria* (*Pasiflora coerulea*). Many of these species are of alimentary, medicinal and industrial importance. Several riparian inhabitants use them. There is little information about the benthic algae and phytoplankton.

18. Outstanding fauna

Among the following species of birds, which are important for their vulnerability, have been recorded: *parina grande* (*Phoenicopterus andinus*), *parina chica* (*P. jamesi*), *burrito overo* (*Porzana spiloptera*) and *gaviota cangrejera* (*Larus atlanticus*). Four families among the fish of Cordoba (Auchenipteridae, Characidiidae, Serrasalminidae and Thampichthyidae) are found only in the Bañados del Río Dulce. The Primero and Segundo rivers that empty into the southern shore of the lake have more than 20 species each, the most important being *Astyanax cordovae*, an outstanding endemic species.

During surveys of fish, it has been proven that the Bañados del Río Dulce function as a breeding area for at least 27 species indigenous to this river. In addition, six larger species have been recorded, *Cyprinus carpio*, *Hoplias malabaricus*, *Leporinus obtusidens*, *Pimelodus albicans*, *Prochilodus platensis* and *Salminus maxillosus*, all of importance for sport fishing and human consumption. Their density is greatest in this area in the entire province. This area is also an important stopping point for migratory species such as *Prochilodus platensis* and *Salminus maxillosus*.

During surveys of the *bañados*, species such as *Aphyocharax erythrurus*, *Characidium fasciatum*, *Loricariichthys maculatus* and *Pimelodella gracilis* have been recorded in small numbers. Therefore, until more accurate data is obtained, their population status should be considered biased. Information on other groups of fauna is slight and based only on sightings, without formal surveys. Because of its regional numerical and economic importance, populations of nutria (*quiyá*) (*Myocastor coypus*) on shores and in the marshes should be mentioned. Other species are threatened locally by destruction of their habitats, especially in buffer areas. There is little information on invertebrates and the composition of the zooplankton.

19. Social and cultural values:

In the area of Bañados del Río Dulce, livestock raising is regionally important because there is pasture and water in a large area that does not have an exploitable water table. Although the farms in this area are large, more than 5000 hectares, their owners do not live there. Some 21,000 head of cattle are raised here. Inhabitants in the area follow a transhumance culture moving cattle from La Rinconada, Las Saladas, Pozo de la Olla, Puesto de Castro, Rosario del Saladillo and Villa Candelaria and other areas towards the marshes at the beginning of the winter and

returning when the rains begin. The productive capacity of the flooded grasslands is based on the effect of the contribution of water and sediments from Río Dulce. Production values calculated on plant samples give 43 to 52 kilos of dry pasture per hectare per day under continuous grazing. This level of production can feed four or five cows per hectare. Beyond the area of influence of Río Dulce but within the area of the reserve, there is a low level of production of natural pasture that is used mostly for herds of sheep and goats. Grazing is combined with the use of the forest as a source of firewood and charcoal. On the western border of the reserve, there is a strong pressure from the farming frontier, primarily for growing soybeans. At the present time in the bañados, there is a permanent population of 300 families. They are farmers that grow crops for subsistence and sale (extensive livestock raising and smaller ruminants, barnyard birds). They sell the skin of the *coypu*, fish in the rivers, and burn the *espartillares* in order to take advantage of young shoots for grazing cattle. This is a well-established cultural strategy.

In the area of Laguna de Mar Chiquita, there is commercial fishing in the open sea for *pejerrey* (*Odonthestes bonariensis*). In Laguna de Mar Chiquita, it is an activity that stands out because of its social and economic importance and is sustainable if there are no changes to the water regime of the lagoon. In the reserve, there is commercial fishing carried out by about 120 small-scale companies, employing about 750 persons involved in this activity. On the southern coast, tourism and outdoor recreation are traditional activities in the lagoon with salt and mud baths for therapeutic purposes. There is now increased awareness about the advantages of the landscape, wildlife, sport fishing, boating, photography and bird watching. The area's potential for ecotourism is not limited to the town of Miramar. It is also important activity related to use of the *coypu* (*Myocastor coypu*), which was domesticated a long time ago from wild populations in the Bañados del Río Dulce. It is the basis for an important activity of raising, selection and establishing characteristics of skin, manufacture and exportation. Its meat is traded commercially, with considerable domestic demand. In 2001, 25 breeders produced approximately 32,000 skins. Wild populations also provide an important income. It is estimated that small-scale hunting of the *coypu* in the marshes in the province of Córdoba reaches 40,000 skins per year. This activity is not regulated, but provisions for regulation should be made in the future.

In the area of the Bañados del Río Dulce and Laguna de Mar Chiquita, the lower Río Dulce and the lagoons in the area northeast of Mar Chiquita form an important anthropological site. Río Dulce was a means used by human beings for travel from very early times and probably by the original inhabitants of the central-south part of Argentina. Human remains have been found with earlier racial characteristics than the population of the Córdoba Hills at the time of the European conquest. Distinct ethnic populations left anthropological sites during multiple and long visits to the area. There is a site from an agrarian-pottery culture in Santiago del Estero (Sunchituyo), still not fully studied. In the middle of the lake, there is a native population, the Queloncis, whose culture was exclusively paludal. They lived on the islands, but the rise in water level has hidden a good part of the anthropological evidence. On the eastern and southern coast of Mar Chiquita, there are important archaeological findings of a Sanavirona culture with the presence of stone materials, funerary urns, beads, small statues and a large amount of the remains of pottery and basket weaving. There are also anthropological remains.

This area is an important palaeontological deposit. Remains of *esclerocaliptos*, *gliptodontes*, *megaterios*, *celidoterios*, teeth and others from the Pleistocene. The museums in Altos de Chipión, Balnearia, La Para, Miramar and Morteros have carried out important archaeological, anthropological, palaeontological and historical research.

20. Land tenure/ownership of:

Laguna de Mar Chiquita (approximately 800,000 hectares) is public land (Government of the province of Córdoba) up to the elevation of 67.03 metres above sea level with a buffer area around the town of Miramar of 71.77 metres above sea level. The area of the rivers is public land up to the high water mark. The land in the area proposed for the wetland reserve is mostly private land.

21. Current land use:

The main use in the northern and western part of the area is for extensive raising of cattle, sheep and goats. Towards the western border, where the soil characteristics are less limiting, there are advances of the Eastern Chaco woodlands that make possible exploitation of the forest for firewood and charcoal production. Towards the southern and eastern borders, exploitation is mixed: agriculture (soybean, wheat, maize, sunflower), livestock raising (cattle) and dairy farming (with alfalfa and oats and the use of the Holando-Argentino breed of dairy cattle). There are also urbanized areas, agro-industrial exploitations and dairies.

In the surrounding area contiguous to the site, there is more intensive use of the land with the same activities described for the southern and eastern area in the western part. This is the largest dairy area in Argentina, with irrigated crops of forage and grains.

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

Past and present adverse factors at the site: There is use of out-dated and inefficient irrigation systems under conditions of increasing salinization of irrigated areas. The inter-provincial convention (Córdoba-Santiago del Estero-Tucumán) merits special attention. It regulates the use of water resources of Río Salí-Dulce. This convention establishes maximum quotas for use of the average annual flooding of the basin, which are clearly unfavourable for the conservation of the wetlands in the lower part of the river (provinces of Córdoba and Santiago del Estero). This convention was signed in 1967 by the provinces of Córdoba, Santiago del Estero and Tucumán and was required by the international financial institution that financed the Dique de Río Hondo. The convention sets the percentages of the flow, but does not clearly define the tributaries, which has made it incoherent from the technical point of view. The system of the Bañados del Río Dulce and Laguna de Mar Chiquita require a water regime of cycles produced by nature through periodical flooding of the river. It is important to guarantee not only an ecological flow but also the form in which these flows enter the system.

An inter-jurisdictional technical commission for the basin of Río Salí-Dulce has been in operation since 1998 as a mechanism for consultation among the provinces and has promoted the carrying out of hydrological and environmental studies. This will quickly remedy in the lack of basic data required to fix the hydrological parameters required for determining volumes and regulating the distribution with an up-dated emphasis that takes into account the needs of the entire basin. The province of Córdoba has argued for the need to begin discussion of a new convention to replace that signed in 1967, covering the topics of deforestation in order to create farm land, agricultural use of inapt or overgrazed soils, drying-out of areas that retain water using canals and an increase in surface runoff, illegal trade in species and eutrophication in small lakes and parts of Mar Chiquita.

Adverse factors in the surrounding area that directly affect it are intensification of the use of agrochemicals in areas under irrigation and drainage, deforestation of the watersheds and forest fires. There are at least three projects for transferring water to other water basins. Additional factors being considered are increasing the rate of runoff by removing shallows in the rivers and reducing dumping of industrial and domestic waste in the basins of Río Segundo and Río Primero).

23. Conservation measures taken:

The entire site is part of the System of Protected Nature Areas of the province of Córdoba, classified as the multiple-use provincial reserve of Bañados del Río Dulce and Laguna de Mar Chiquita, which, in accordance with existing legislation, involves protecting the environment through the regulated use of natural resources, respecting its characteristics, ecological status, wildlife and potential resources. This declaration was made in 1994. In 2000, a group of provincial park wardens was formed. In 2001, there were four new park wardens, one expert and a technician for implementation of conservation, preventing and regulation of environmental legislation in the reserve. The headquarters for the reserve is in the town of Miramar and in addition four new posts have been created in La Para, La Rinconada, Morteros, Rosario del Saladillo and Villa Candelaria.

A programme exists for regulating the body of water for monitoring commercial fishing and the use of the surrounding land and islands in the lake. The reserve has been equipped with communication, camping equipment and two vehicles (Rastojero Diesel and Renault 12) and a boat (a motorboat with a 115 Hp motor).

Agencia Córdoba Ambiente carries out the following activities: Advising and authorizing requests for forest clearance and use, regulating hunting and commercial and sport fishing, coordination of activities for prevention and fighting forest fires. There is no approved management plan under implementation. In preparation for implementation of a management plan, a survey is being carried out of ranchers in the area of the reserve and consultations are held with the municipios and towns concerned.

24. Conservation measures proposed but not yet implemented:

The following measures have been proposed:

Preparation of a management plan for the area based on a survey of ranchers and taking into account the economic and social situation;

Coordination of activities for regulating wildlife and fishing with the provinces of Santa Fe and Santiago del Estero;

Signing of a convention of cooperation with the municipios and towns in the area. The objective is conservation of the site and channelling of economic activities including tourism and the activities of public services in accordance with a programme of negotiated management

Cooperation with the provincial police for the prevention of crimes.

25. Current scientific research and facilities:

Several research groups from three national universities are working in the area. However, there are currently no research plans coordinated between Agencia Córdoba Ambiente and the agencies that make research grants. Among the research under way is survey of the status of vegetation in northern Córdoba, a soil-use survey, a socio-economic study of the commercial fishermen in Mar de Ansenusa and a survey of waterfowl and shorebirds. After the survey of ranchers, the Agency will begin a compilation of layers of information for setting up a GIS system. As for the existing infrastructure, because of the work under way, the Agency will have available a central office in Miramar with a meeting room, library, information centre and communications base and four offices, two of which have accommodations in areas without sufficient urban infrastructure located in La Rinconada and Villa Candelaria.

26. Current conservation education:

Currently, there are educational activities but there still is no official programme for the Agencia Córdoba Ambiente. However, it is being prepared and will involve participation of the municipios, local educational centres and information activities of the posts of La Para, Miramar and Puesto de Castro.

27. Current recreation and tourism:

The number of tourists visiting the area of Laguna de Mar Chiquita is estimated to be more than 80,000 persons per year, mainly during the summer. Tourism is traditional of rest and recreation with activities related to the beach and water, including excursions. Sport fishing attracts the largest amount of tourism in the months with the lowest temperatures (June, July and August). Tourism is concentrated on the eastern and southern shores of the lake at the campsites and hotels of the nearby urban centres. Tourism for health, because of the mineral properties of the water and mud and relative installations were formerly very popular but has become insignificant. There are photographic safaris for observation of fauna and flora (especially birds) and environmental interpretation. Although the number of tourists visiting the area does not represent a threat of negative impact on the area, ecotourism is preferable as a tool for sustainable development.

28. Jurisdiction:

This area is under the jurisdiction of the province of Córdoba. The Agencia Córdoba Ambiente Sociedad del Estado is responsible for the administrative aspects of conservation and depends on the Secretaría General of the governor's office. By law it is the agency responsible for everything involving coordination and implementation of activities for protection of the environment with the objective of sustainable development. The agency uses the system of conservation areas of the province in the context of land use. Other sectorial administrative agencies (Dirección Provincial de Aguas y Saneamiento, Agencia Córdoba Ambiente S.E., Dirección de Minería and others) coordinate several of the activities in the proposed area.

29. Management authority:

Agencia Córdoba Ambiente Sociedad del Estado
Avenida Richieri 2350
5000 Córdoba
Argentina
Tel.: (54 351) 434 3310/11/12, 434 3475
E-mail: agenciacordobaambiente@cba.gov.ar
www.medioambiente.gov.ar

30. References: