# Information Sheet on Ramsar Wetlands

1. Date this sheet was completed/updated: 5 March 2001

2. Country: Dominican Republic

3. Name of wetland: Lago Enriquillo

4. Geographical coordinates:

    18º 28' North latitude
    71º 39' West longitude

5. Altitude: Sea level. Lago Enriquillo is the lowest point on the southern coast of the island. Its current level is less than 40 metres below sea level.

6. Area: Approximately 20,000 hectares

7. Overview:

This wetland is an inland lake with hypersaline water, 35 kilometres long and eight metres in maximum depth. It was a former sea channel and is the largest lake in the Caribbean. The water is sulphuric with salinity that varies between 40 and 90 ppm. Water level fluctuates cyclically. There is a large island, Isla Cabritos, and two small islands, La Barbarita and La Islita. It is fed by seasonal streams, and on its shores there are floodplains, wet grasslands and irrigated crops.

8. Wetland type: Inland Q

9. Ramsar criteria: 1, 2 and 3

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:

Bienvenido Santana
Dominga Polanco
Cecilia Hernández

Dirección General de Vida Silvestre y Biodiversidad
Avenida John F. Kennedy, kilometre 61/2
Los Jardines del Norte

Santo Domingo
Dominican Republic

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

Criterion 1: Lago Enriquillo is the largest lake in the Caribbean. It is below sea level and is hypersaline. In addition, it is located in a basin that collects water from two mountain ranges, Sierra de Bahoruco and Sierra de Neiba, which contain areas of cloud forest in good conservation status. It also receives water from Río Yaque del Norte, which begins in the Cordillera Central.

Criterion 2: In this wetland, there are specimens of the regional biodiversity in terms of species, genetic resources and ecosystems. This lake has the three largest endangered species on the island, namely *Cyclura cornuta* and *C. ricordii* and *Crocodylus acutus*. It is also the habitat of at least 65 species of native or migratory birds of which five are endangered, including the flamingo *Phoenicopterus ruber ruber*, *cuchareta* (*Ajaia ajaja*) and *coco prieto* (*Plegadis falcinellus*).

Criterion 3: At least 35 species of birds especially important for the Caribbean region are present at this lake, whose populations fluctuate by hundreds of specimens.

13. General location:

This wetland is located in the administrative region of Suroeste, covering two provinces, Independencia and Bahoruco, whose administrative centres are the cities of Jimaní (on the border with Haiti) and Neiba.

14. Physical features:

Geology: Lago Enriquillo is located in a tectonic basin from the recent Quaternary, whose formations originated in volcanic and sedimentary rocks. The surface is composed of marine/lacustrine deposits, mainly impermeable calcareous clays. At the southern end of the lake, there are limestone rocks and aggregated calcareous rocks composed of sediments alternated with layers of mud, salt, sands with fossilized limestone and sandy clays of saline formation (Upper Miocene).

Geomorphology: In general, relief is flat and relatively flat on the edges. In the extreme eastern and western parts, there are areas of swamps.

Origin: Natural. In the Miocene, this was part of a large marine channel that joined Bahía de Neiba (in the Dominican Republic) with Port au Prince (in Haiti) and separated the island of Hispaniola into two paleo islands.

Hydrology: Most of the water that feeds the depression of Lago Enriquillo comes from the Bahoruco and Neiba Mountains. The contribution of Sierra de Neiba is greater because a large part of the water that it produces drains toward this lake. The main rivers are the Barreras, Guayabal and Panzo. However, water from the Bahoruco Mountains drains mostly to the Caribbean Sea, and only Las Damas and Bermesí rivers empty into the lake. The main geological unit of both mountain ranges is limestone, which is active and creates many underground springs that drain toward

the lake. These contributions help decrease levels of salinity in the lake. The best-known underground springs are Boca de Cachón, La Azufrada, La Furnia, Las Barías, Las Marías and Los Borbollones.

Soils: Most of the soil in the Neiba Valley is covered with fine sediments of marine or fluvial origin. During the incursion of the sea, sediments accumulated on the bottom of the bay. During emersion, Río Yaque del Sur and other rivers that drained the valley deposited their sediment here. In the central part of the valley, all the sediments are of more recent origin (Quaternary), while the sediments along the shores of the lake are inapt for farming because of their lumpy structure and date from before the Miocene. Soils in the Neiba Valley belong to the Enriquillo-Tamayo association. Except for the alluvial fans, all the soils are Quaternary alluvium and limestone clay. They have a sandy texture and a deep profile, but are poorly developed. In general, the soils have a high content in salts. Only in areas with irrigation systems is the salt washed out and the soils are apt for agriculture. These are alluvial and sandy soils.

Water quality, depth and permanence: In 1977, measurements of water quality indicated that salinity was between 40 and 80 per cent, pH varied between 8.35 and 8.45 and dissolved oxygen was between 0.46 and 1.7 milligrams/litre. For 1992, salinity was 71.2 ppm, pH was between 7.5 and 8.4, dissolved oxygen varied between 2 and 8 milligrams/litre and turbidity averaged 7.9 NTU. In that same year, depth was recorded as 8 metres with an average of 4.6 metres. In 1992, the maximum depth recorded in the northern part of the lake was 22.5 metres. The lake maintains a permanent body of water that fluctuates based on the influence of local rainfall, hurricanes and storms. In 1979, at the time of hurricane David, the water level of the lake rose by five metres.

Changes in level: Changes in the area of the lake are enormous. Several times in this century, the lake almost formed two bodies of water, separated by a land bridge between Boca de Cachón to the northwest and Los Ríos in the northern and central parts of the lake.

Climate: The region of the lake is characterized by high temperatures with an annual average of 28.3° C. Daily variation is high, with minimums between 20° and 25° C and maximums above 40° C. Annual precipitation in the area is between 470 and 780 millimetres. Rainfall is bimodal with rains in April–May and September–October. In 1979, the temperature of the water in the lake ranged between 23.9° and 29.2° C. Annual evaporation for 1992 was calculated to be 2100 millimetres.

15. Hydrological values:

Recharging of aquifers: This lake is the stabilizing agent of the hydrology of the basin, taking into consideration that it supplies many sources of underground water located there in addition to the contributions that it receives from rains and the rivers that drain toward this wetland.

16. Ecological features:

Among the five main types of wetlands established by the Ramsar Convention, Lago

Enriquillo corresponds to the categories of lacustrine and paludal. Its main habitats are aquatic and terrestrial. Among the aquatic sites are swamps, marshes and mudflats, while on the land there is natural vegetation, aquatic vegetation, mangroves, halophytic vegetation, dry vegetation within which there is dry matorral with Cactaceae and pure dry vegetation. There is also secondary vegetation as a result of the impact of farming.

17. Noteworthy flora:

*Rhizophora mangle* and *Conocarpus erectus* are species of mangrove that are endangered in the Dominican Republic. *Batis maritime* and *Sesuvium portulacastrum,* halophytic vegetation, are fed on by the iguana (*Cyclura* sp.) in the area. *Bursera simarouba*, *Guaiacum officinale* and *G. sanctum* are species of dry vegetation used as sources of timber. The *Guaiacum* are subject to international regulations, as are *Malpighia domingensis* and *Lemaiocereus hystrix*, both endemic to Hispaniola. *Neoabbotia paniculata*, from the dry matorral, is an endemic species that is endangered because of its use as timber.

18. Outstanding fauna

Fish: The largest species in the lake are tilapia (*Tilapia mossambica*), introduced at the end of the 1950s, and *viajaca* (*Cichlosoma haitiensis*). Small fish are *Ciprinodon* sp. and *Limia perugiae*. Another species is *Gambusia hispaniolana*, endemic to Hispaniola, and also *Limia sulphurophilla*, endemic to the lake's watershed.

Reptiles: *Crocodylus acutus* lived in almost all the estuaries and mangroves of the Dominican Republic until the nineteenth century. At the present time, its population is found only in this lake and has dropped to about 200 adults, 200 juveniles and between 200 and 800 young crocodiles. *Cyclura cornuta cornuta* and *C. ricordii* are endemic species to Hispaniola. These species and *Crocodylus acutus* are the largest terrestrial reptiles found in the Dominican Republic. *Ameiva lineolata lineolata* is a very common endemic species.

Birds: So far, 65 species have been recorded for this habitat, including aquatic, terrestrial, resident and migratory species. Five of them are endangered: *Ajaia ajaja, Columba inornata, Corvus palmarum palmarum*, *Phoenicopterus ruber ruber*, several specimens of which have been seen at this lake, and *Plegadis falcinellus falcinellus*. *Dendrocygna arborea, Egretta thula, Egretta tricolor*, *Himantopus mexicanus*, *Oxiura bahamensis bahamensis* and *Oxiura jamaicensis jamaicensis* are resident native species. There are also records of *Sterna caspia*, which is a migratory species.

19. Social and cultural values:

Historical and archaeological importance: At the time of the arrival of the Spanish, the island was inhabited by the Taíno Indians, who had divided the island into five regions called *cacicazgos*. The area around the lake was located in the Xaragua (Jaragua) *cacicazgo*. The caves and caverns located around the lake were important to the Taínos because they believed that man originated there. They were used as holy places and cemeteries as well as refuges at the time of hurricanes. They decorated the walls of the caves with drawings and petroglyphs with themes alluding

to their cultural activities. The best example of Taíno art at the lake is found in a former coral reef called Las Caritas, an archaeological site now visited by tourists.

Fishing: There has been small-scale fishing at the lake for a long time. Fishing and the availability of fish depend on the degree of salinity of the water and the use of small boats (*chinchorros*). This fishing technique was developed by local fishermen.

*Crocodylus acutus* is the most controversial species at the lake. The main reason for its drop in population is that it is killed for its penis, which is thought to have aphrodisiac properties. The crocodiles were also killed for meat and fat, used to produce anti-rheumatism creams. Destruction of nests and eggs is a frequent harmful activity for the population of this reptile.

*Cyclura cornuta cornuta* and *C. ricordii* are also species whose populations are endangered, captured and killed.

20. Land tenure/ownership of:

This is property of the Dominican Republic. The area around the lake is occupied mostly by crops that belong to the inhabitants of nearby towns.

21. Current land use:

All the area of the lake, including the islands, is currently protected under the category of national park. The surrounding sites are almost always cultivated intensely and permanently. The most frequent crops are rice, yucca and plantains, among others.

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

Both in the past and now, agriculture represents the main adverse factor because the rivers, streams and underground water that feed the lake are frequently diverted for farming. There are a few drainage works. The longest has an approximate length of 30 kilometres. A potential adverse factor is oil exploration. In the 1980s, exploration was carried out near the lake.

23. Conservation measures taken:

In 1974, only Isla Cabritos was protected as a national park under Law No. 664 of 14 May 1974. This park did not include the lake. In 1996, the Lago Enriquillo National Park was created under Decree No. 233/96, which included the entire lake.

24. Conservation measures proposed but not yet implemented:

Since 1993, the Direccíon General de Vida Silvestre, together with governmental agencies, non-governmental organizations and local groups, has been promoting the Guarocuya Biosphere Reserve, which will have this lake as one of its main centres. In 2000, the document “Strategies for Management of the Southeast” was published as a complementary tool for creation of the proposed biosphere reserve.

25. Current scientific research and facilities:

Installations: There is infrastructure for the administration of the national park located in the town of La Descubierta. On Isla Cabritos, a visitors' centre has been created, which is visited by national and foreign tourists. Material describing the national park is exhibited here and is currently being revised.

26. Current conservation education:

The visitors' centre located on Isla Cabritos carries out educational activities. A tour operator organizes visits to the lake and the island for Dominicans and foreigners. School excursions frequently visit the lake.

Publications: In 2000, the Dirección Nacional de Parques, the current Under-Secretariat for Protected Areas and Biodiversity of the National Secretariat for the Environment and Natural Resources published two information booklets "Monstruos Simpáticos. Los Cocodrilos del Lago Enriquillo" and "El Lago Enriquillo - Patrimonio Natural y Cultural del Caribe". Both pamphlets were written by the biologist Andreas Schubert. The first document provides scientific information on the crocodile, and the second is a description of Lago Enriquillo and its surroundings. This year, the Discovery Channel and Animals' Planet published the video "Al Borde del Quest" on Lago Enriquillo with participation of the former National Parks Office and the Wildlife Department of the Under-Secretariat for Natural Resources, the current General Office for Wildlife and Biodiversity of the Secretariat for the Environment, and the Group Jaragua, Inc.

27. Current recreation and tourism:

Data on the number of visits for the period 1989–1999 (not including 1990, 1992 and 1995). For this period, there were a total of 22,949 visitors. This number of visitors represents important income that contributed to the administration of the area. For the period 1994–1999 (not including the year 1995) income in the amount of DR$ 419,294 was reported.

28. Jurisdiction:

Dominican Republic, provinces of Independencia and Bahoruco, municipios of La Descubierta, Jimaní, Neiba and Duvergé.

Suroeste administrative region: The lake is under the administrative jurisdiction of the Nation Office for Protected Areas of the Under-Secretariat for Protected Areas and Biodiversity of the Secretariat of State for the Environment and Natural Resources.

29. Management authority:

National Office for Protected Areas, Under-Secretariat for Protected Areas and Biodiversity
Avenida Máximo Gómez (Antigua Cementera)
Santo Domingo

Dominican Republic

Head of the field administration: Hermógenes Méndez in the municipio of La Descubierta.

30. References: