

## DOMINICAN REPUBLIC

### INTRODUCTION

by Cecilia Hernandez and Tomas Vargas

The Dominican Republic, with its offshore islands of Saona, Beata and Catalina, covers 48,442 km<sup>2</sup> and comprises 74% of the island of Hispaniola, the remainder being in Haiti. In 1980, the population was estimated at 5,430,000.

According to the classification of Holdridge (1967), nine life zones and seven transition zones are represented in the Dominican Republic:

- a) Subtropical montane shrub (2.07% of the country).
- b) Dry subtropical forest (20.25%), represented in Parque Nacional del Este and Parque Nacional Isla Cabritos.
- c) The transition zone between dry subtropical forest and humid subtropical forest (0.31%).
- d) The transition zone between humid subtropical forest and dry subtropical forest (1.03%), represented in Parque Nacional del Este.
- e) Humid subtropical forest (45.70%), represented in Parque Nacional del Este and Parque Nacional Jose del C. Ramirez.
- f) The transition zone between humid subtropical forest and very humid subtropical forest (0.32%).
- g) Very humid subtropical forest (14.5%), represented in Parque Nacional Los Haitises and Parque Nacional J. Armando Bermudez.
- h) The transition zone between very humid subtropical forest and subtropical rain forest (0.05%).
- i) Subtropical rain forest (0.12%).
- j) The transition zone between humid low montane forest and dry low montane forest (0.05%).
- k) Humid low montane forest (6.63%), represented in Parque Nacional Jose del C. Ramirez and Parque Nacional J. Armando Bermudez.
- l) The transition zone between humid low montane forest and very humid low montane forest (0.50%).
- m) Very humid low montane forest (7.34%), represented in Parque Nacional Jose del C. Ramirez and Parque Nacional J. Armando Bermudez.
- n) The transition zone between very humid low montane forest and low montane rain forest (0.04%).
- o) Low montane rain forest (0.07%), represented in Parque Nacional Jose del C. Ramirez.
- p) Very humid montane forest (0.63%), represented in Parque Nacional Jose del C. Ramirez and Parque Nacional J. Armando Bermudez.

The mountains of the Dominican Republic consist of four parallel mountain chains extending from the northwest to the southeast: Cordillera Central, Cordillera Septentrional, Sierra de Neiba and Sierra de Bahoruco.

The climate is humid tropical with great regional and local variations. Rainfall is high throughout the year, with considerable daily variation, and evaporation is intense. The period of highest rainfall is from May to November and the period of least rainfall, from November to April.

The existing information on wetlands in the Dominican Republic is very limited. In 1980, Bonnelly de Calventi and Garcia de Geralde drew up an inventory of the nation's water bodies on the basis of existing maps. According to these authors, the Dominican Republic possessed 270 lakes, lagoons and ponds varying in size from 0.01 to 25.75 km. However, it is thought that many of these have since disappeared. One of the main causes has been the drainage of wetlands for agriculture and pasture land, a frequent activity in the Dominican Republic in recent years. Other causes include the extraction of sand and the exploitation of salt in saline lagoons. On the other hand, after Hurricane David in 1979, some wetlands increased in size. This was the case at Lago Enriqueillo, the largest wetland in the country and perhaps the best studied.

### Institutional Base for Wetland Conservation and Research

Real progress in the study and conservation of natural resources, including wetlands, did not begin until 1978. However, a variety of institutions and other bodies with interests in wildlife and conservation had existed before this time, and many of these are still active today. Some have reorientated their work while others have been modified. The organizations dedicated to conservation and/or research at the present time are listed below. Most include wetlands and waterfowl within their programmes:

*Departamento de Vida Silvestre*, responsible for the management and conservation of the nation's wildlife.

*Departamento de Recursos Pesqueros*, responsible for carrying out research on marine flora and fauna, particularly from the point of view of commercial development but with regard for conservation.

*Departamento de Inventario de Recursos Naturales*.

*Departamento de Tierras y Aguas*.

*Departamento de Educacion Ambiental*.

*Centro de Biologia Marina*, Universidad Autonoma de Santo Domingo (CIBIMA-UASD); this carries out research on the commercial exploitation of marine resources, and also conducts some studies at inland waters.

*Jardin Botanico Nacional "Dr Rafael Moscoso"*.

*Direccion Nacional de Parques*, responsible for the development, administration, control and management of a system of protected areas with a view to conserving and perpetuating the nation's natural and cultural heritage.

*Museo Nacional de Historia Natural (MNHN)*.

*Parque Zoologico Nacional*, concerned with public education, recreation and research.

*Direccion General de Foresta*.

A number of Ecological Societies and Conservation Groups, including:

*Sociedad Ecologica del Cibao (SOECI)*.

*Sociedad Dominicana para la Conservacion de los Recursos Naturales*.

*Instituto Dominicano de Bioconservacion*.

*Grupo Ambiente de la UCMM*.

*Junta Campesina para el Desarrollo Forestal de la Provincia de Peravia, Bani*

*Sociedad Dominicana de Ornitologia*.

Twenty-four Ecological Societies and five Environmental Education Groups (Grupos de Educacion Ambiental).

### Progress in Wetland Conservation and Research

The Dominican Republic currently has eighteen protected areas, included within three categories:

#### National Parks

Los Haitises, established 1976

Cabo Frances Viejo, established 1964

De Puerto Plata, established 1971

Litoral del Sur, established 1968

J. Armando Bermudez, established 1956

Jose del C. Ramirez, established 1958

Isla Cabritos, established 1974

Del Este, established 1975

Monte Cristi, established 1983

Jaragua, established 1983

Sierra de Bahoruco, established 1983

#### Scientific Reserves

La Cacatita, established 1976

Loma Isabel de Torres, established 1983

Valle Nuevo, established 1983

Lagunas Redonda y Limon, established 1983

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Laguna de Cabral o Rincon, established 1983  
Cayos Siete Hermanos, established 1983  
National Historical Parks  
Zona de la Vega Vieja, established 1977

In 1983, the Departamento de Vida Silvestre completed a study on the Barahona Peninsula in the south and southeast of the country; this includes various wetlands such as Laguna Rincon and Laguna de Oviedo. Two protected areas were created as a result of this study; Parque Nacional Jaragua, which includes Laguna de Oviedo, and Reserva Cientifica Laguna de Cabral or Rincon. The study, which also involved the Direccion Nacional de Parques, the Museo Nacional de Historia Natural and the Jardin Botanico, was to a considerable extent responsible for preventing a large part of the area from being buried under tons of domestic sewage in an agro-industrial project. The sewage was to have been brought in from the U.S.A. by the Atlantic Forests Products Company.

Projects currently in progress concerning wetlands and their fauna include the following:

- a) A study of Lago Enriquillo with a view to proposing an extension to the Parque Nacional Isla Cabritos which would give protection to the lake itself (Departamento de Vida Silvestre).
- b) An inventory and evaluation of the different types of ecosystems in the Dominican Republic, with a view to the management and exploitation of wildlife (Departamento de Vida Silvestre).
- c) A wetlands programme including inventory projects covering coastal lagoons, mangroves, sea-grass beds and coral reefs (CIBIMA-UASD).
- d) Biological investigations of aquatic fauna and flora (CIBIMA-UASD).
- e) A programme for non-traditional aquatic resources (CIBIMA-UASD).
- f) A conservation programme for aquatic resources and environmental protection (CIBIMA-UASD).
- g) A study of the fauna of the Gran Cafada in the Jardin Botanico Nacional (MNHN).
- h) Biological and ecological studies of marine turtles (MNHN).
- i) Studies of the biology and reproduction of species in Lago Enriquillo (MNHN).

Projects already completed include:

- a) The development of fishing in the Dominican Republic (Instituto Dominicano de Tecnologia).
- b) A study of the natural resources of Laguna del Rincon (Secretaria de Estado de Agricultura).
- c) Research on six habitats important for the Dominican Republic's indigenous fauna: II Laguna Saladilla and III Laguna Salada (Universidad Nacional Pedro Henriquez Urefa).
- d) A study of wildlife areas on the Barahona Peninsula and Isla Beata, and proposal for the creation of a National Park (Departamento de Vida Silvestre, MNHN and Direccion Nacional de Parques).
- e) A cartographic inventory of the inland water bodies of the Dominican Republic (CIBIMA-UASD).

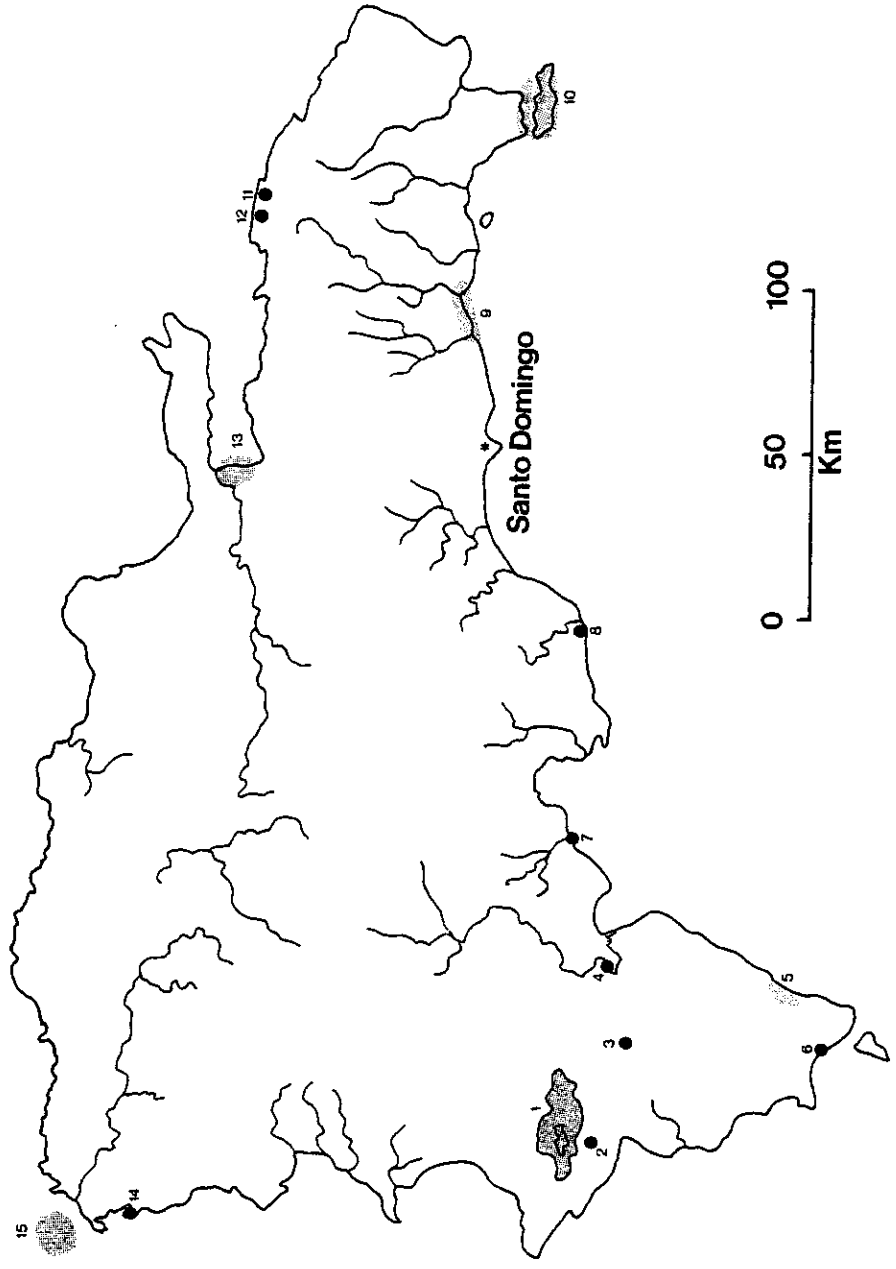
### **Major Threats to Wetlands and Waterfowl**

Because of the lack of information on the wetlands of the Dominican Republic, it is impossible to determine the full extent to which these ecosystems are threatened. However, it is known that wetlands are under threat from a variety of sources including drainage for agriculture and pasture land, the felling and burning of mangroves and other vegetation bordering lakes and lagoons, and excessive fishing, particularly at those wetlands around which there are human populations who depend on this activity as a means of subsistence.

Other detrimental activities having a direct effect on waterfowl populations include: the use of pesticides; egg-collecting, particularly the eggs of species of Ardeidae, Threskiornithidae, Anatidae, Rallidae and Laridae; excessive hunting practiced without any effective controls; the mining of sand and stone for construction purposes, which is posing a serious threat in some estuaries; and tourist development without prior study of the environmental impact.

In recent years, the country's wetlands have been exposed to new threats such as the dumping of industrial waste and the establishment of shrimp-farming projects. The latter problem is apparent in the recently created Monte Cristi National Park, where there is a proposal to exploit the natural riches of the area in the development of a shrimp industry.

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## WETLANDS

Site descriptions based on data sheets compiled by Cecilia Hernandez and Tomas A. Vargas of the Departamento de Vida Silvestre, with information from Venecia Alvarez, Idelisa Bonnelly de Calventi, Geraldino Caminero, Julio Cicero, Jurgen Czerwenka, Maria E. Feliz de Cedefo, Nelson Garcia, Manuel Gonzalez, Sixto J. Inchaustegui, Matilde Mota, Ramon O. Sanchez, Miguel Silva, Domingo A. Siri and Servio R. Sosa.

## Lago Enriquillo (1)

**Location:** 18°28'N, 71°39'W; 60 km WNW of Barahona, Provinces of Bahoruco and Independencia.

**Area:** 26,500 ha.

**Altitude:** 46m below sea level.

**Province and type:** 8.40.13; 14, 16 & 17.

**Site description:** A large permanent hypersaline lake, 35 km long and up to 8m deep, in an old sea channel; the largest lake in the Antilles. The water is sulphuric; the salinity varies from 40 to 90 p.p.t.; and the level fluctuates in cycles of many years. There is one large island, Isla Cabritos, and several small islands. The lake is fed by seasonal streams, and there are areas of seasonally flooded marshes, wet grassland and irrigated cultivation along the shore.

**Principal vegetation:** Marshes with *Typha sp.*, *Pistia stratiotes* and *Nasturtium officinale*. In the subtropical dry forest and subtropical thorn woodland zones, with *Prosopis juliflora*, *Neobabbottia paniculata*, *Uniola virgata*, *Phyllostylon brasiliensis* and *Bursera simaruba*.

**Land tenure:** State owned.

**Protection:** Isla Cabritos is a National Park of 2,600 ha, established in 1974; the lake itself and its surrounding marshes are unprotected.

**Land use:** Fishing and waterfowl hunting. Agriculture, livestock grazing and wood-cutting for charcoal production in surrounding areas.

**Waterfowl:** A very important area for breeding, passage and wintering waterfowl of a wide variety of species, and one of the most important localities in Hispaniola for the Caribbean Flamingo *Phoenicopterus ruber*. Flamingos may have nested regularly in the 19th century, but the only reports of breeding in recent decades were in 1975 and 1977 when colonies of 20-30 pairs were located. Up to several hundred birds are regular as non-breeding visitors, and 500-600 were recorded in January 1978. Other common species include *Ixobrychus exilis*, *Nycticorax nycticorax*, *Nyctanassa violacea*, *Butorides virescens*, *Egretta caerulea*, *E. tricolor*, *E. rufescens*, *E. thula*, *E. alba*, *Ardea herodias*, *Eudocimus albus* (breeding), *Plegadis falcinellus* (breeding), *Ajaia ajaja*, *Anas bahamensis*, *Gallinula chloropus*, *Himantopus himantopus* (breeding) and *Sterna albifrons*. Common Nearctic migrants include *Anas discors*, a wide variety of shorebirds, *Larus atricilla*, *Hydroprogne caspia* and *Sterna hirundo*.

**Other fauna:** The lake supports an important population of the American Crocodile *Crocodylus acutus*, recently estimated at between 175 and 250 individuals. The iguanas *Cyclura cornuta* and *C. ricordii* occur around the lake and on Isla Cabritos. The introduced *Tilapia mossambica* supports a small local fishery.

**Threats:** Freshwater streams in the surrounding hills and subterranean waters have been diverted for irrigation, reducing the inflow into the lake and resulting in a gradual falling in level. The marshes are being converted into pasture and agricultural land, and the surrounding forests are being destroyed for charcoal. There is indiscriminate hunting of waterfowl, and some crocodiles are shot for "sport", as curios, or for "medicinal" oils.

**Research and conservation:** A number of faunal and floral investigations have been carried out at the lake, and a major study of the *Crocodylus acutus* population is currently in progress. Lago Enriquillo is of great scientific interest as a fossil marine ecosystem and should be protected from any further degradation.

**References:** Bonnelly de Calventi (1978 & 1980); Wiley & Wiley (1979); Bonnelly de Calventi & Garcia de Geralde (1980); Peña Franjul *et al* (1980).

**Source:** Idelisa Bonnelly de Calventi, Maria E. Feliz de Cedefo, Nelson Garcia, Sixto J. Inchaustegui and Domingo A. Siri.

**Criteria for inclusion:** 123.

Laguna Limou (2)

**Location:** 18°24'N, 71°43'W; south of Lago Enriquillo, 17 km ESE of Jimani, Independencia Province.

**Area:** Several hundred ha.

**Altitude:** 10m.

**Province and type:** 8.40.13; 08 & 12.

**Site description:** A permanent freshwater lake, up to 2m deep, with some mangroves and abundant aquatic vegetation. The lake was partially drained for agriculture in the early 1970s.

**Principal vegetation:** Mangroves *Conocarpus erectus*.

**Land tenure:** State owned.

**Protection:** None.

**Land use:** Fishing, hunting and exploitation of wood for charcoal.

**Waterfowl:** An important area for resident and migratory waterfowl, with one of the largest populations of *Fulica caribaea* in the Dominican Republic. Other residents include *Podilymbus podiceps* and *Oxyura jamaicensis*. A variety of Anatidae occur on migration, the commonest being *Anas discors*. Formerly an important feeding area for *Phoenicopterus ruber*, but none have been recorded since the drainage in the early 1970s.

**Other fauna:** No information.

**Threats:** Disturbance from hunting and fishing.

**Source:** Manuel Gonzalez.

**Criteria for inclusion:** 3a.

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Laguna Bermesi (3)

**Location:** 18°18'N, 71°27'W; 3-4 km west of Angostura, Independencia Province.

**Area:** 125 ha.

**Altitude:** 0m.

**Province and type:** 8.40.13; 08 & 12.

**Site description:** A permanent freshwater lake, up to 1m deep, with associated marshes and some mangroves. The level of the lake fluctuates according to local rainfall.

**Principal vegetation:** Marshes with *Typha domingensis*, and mangroves *Conocarpus erectus*.

Surrounded by natural pastures and xerophytic woodland.

**Land tenure:** No information.

**Protection:** None, but the lake is difficult of access and little disturbed.

**Land use:** Some hunting; cattle ranching, agriculture and exploitation of wood for charcoal in surrounding areas.

**Waterfowl:** An important area for resident and migratory waterfowl, with a large population of *Fulica caribaea*. Large numbers of Anatidae, principally *Anas discors*, and shorebirds occur on migration.

**Other fauna:** No information.

**Threats:** Diversion of water for irrigation and overgrazing by domestic livestock are the principal threats.

**Source:** Manuel Gonzalez.

**Criteria for inclusion:** 3a.

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Laguna de Rincon (Laguna de Cabral) (4)

**Location:** 18°17'N, 71°15'W; 1 km north of Cabral, Barahona Province.

**Area:** 3,000 ha.

**Altitude:** 141m.

**Province and type:** 8.40.13; 08, 12 & 16.

**Site description:** A permanent fresh to brackish lake, up to 6m deep, with associated marshes, some mangroves and surrounding seasonally flooded grassy plains. The lake is fed by the Rio Yaque del Sur and several smaller streams. There is a small seasonal freshwater lake (Laguneta Seca) 0.5 km to the north.

**Principal vegetation:** Marshes with *Typha domingensis*, *Potamogeton nodosus*, *Sagittaria lancifolia*, *Arundo donax*, *Nelumbo lutea*, *Nymphaea ampla* and *Ceratophyllum demersum*; mangroves *Conocarpus erectus*. In the dry subtropical forest zone.

**Land tenure:** State owned.

**Protection:** Laguna de Rincon was declared a Scientific Reserve in August 1983, but no special protection measures have been implemented, pending a study of the social problems which may arise. Laguneta Seca is unprotected, but there is a proposal to include the lake within the limits of the Scientific Reserve.

**Land use:** Intensive fishing for various species of fishes, freshwater shrimps and turtles, and waterfowl hunting; cattle ranching, agriculture and exploitation of wood for charcoal in surrounding areas.

**Waterfowl:** An important area for a wide variety of resident, passage and wintering waterfowl. Resident species include *Podiceps dominicus*, *Egretta caerulea*, *Ardea herodias*, *Gallinula chloropus*, *Porphyryla martinica*, *Fulica americana* and *Jacana spinosa*. Common passage migrants and non-breeding visitors include *Plegadis falcinellus*, *Phoenicopterus ruber* (up to 155 in recent years), *Anas discors*, *A. acuta*, *A. clypeata*, *Aythya affinis* (up to 1,000), many shorebirds, and *Hydroprogne caspia*. Over 1,000 *Tringa flavipes* were present in March 1984.

**Other fauna:** *Pandion haliaetus* is a regular winter visitor. The lake is the principal locality and centre of distribution of the endemic freshwater turtle *Chrysemys decorata*.

**Threats:** The marshes are being drained for agriculture, and the mangroves uprooted and burned. The Government plans to divert the main river entering the lake for agricultural projects nearby. Intensive fishing and indiscriminate hunting cause a considerable amount of disturbance.

**Research and conservation:** A considerable amount of research has been conducted on the fauna and flora of the lake. Although declared a Scientific Reserve in 1983, the diversion of water supplies and destruction of mangroves continues, and unless some action is taken in the very near future, much of the lake ecosystem will be destroyed and the locally important fishery lost.

**References:** Inchaustegui (1978 & 1983); Wiley & Wiley (1979); Bonnelly de Calventi (1980); Departamento de Vida Silvestre (1980a); Bolay *et al* (1983); Salcedo *et al* (1983).

**Source:** Geraldino Caminero, Nelson Garcia, Manuel Gonzalez and Sixto J. Inchaustegui.

**Criteria for inclusion:** 1c, 2b & 3a.

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#### Laguna de Oviedo (5)

**Location:** 17°46'N, 71°21'W; near Oviedo, Pedernales Province.

**Area:** 2,488 ha.

**Altitude:** 0m.

**Province and type:** 8.40.13; 05, 07 & 08.

**Site description:** A permanent highly saline coastal lagoon, up to 9m deep, with muddy shores, mangrove swamps and several small islands; separated from the sea by a belt of sand dunes 200-400m wide. The lagoon has no direct connection with the sea except during storms. The water level fluctuates considerably according to local rainfall.

**Principal vegetation:** Beds of *Ruppia maritima*; mangrove swamps with *Conocarpus erectus*; some brackish marshes with *Typha* sp. In the subtropical dry forest zone, with *Prosopis* sp and various cacti.

**Land tenure:** State owned.

**Protection:** Within the Jaragua National Park, established in 1983 but not as yet fully implemented.

**Land use:** Fishing, waterfowl hunting, and extraction of salt; uncontrolled livestock grazing and agriculture in surrounding areas.

**Waterfowl:** An important area for breeding, passage and wintering waterfowl. Breeding species include *Podilymbus podiceps*, *Pelecanus occidentalis*, *Egretta rufescens* and *Eudocimus albus*. Many Nearctic Anatidae and shorebirds occur on migration and in winter, and *Phoenicopterus ruber* is a regular visitor in small numbers.

**Other fauna:** *Pandion haliaetus* is a winter visitor. The freshwater turtle *Chrysemys decorata* occurs in the streams entering the lagoon, and the iguana *Cyclura cornuta* occurs on the islands.

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**Threats:** Part of the lagoon has been converted into salt pans for salt extraction; there is indiscriminate hunting of waterfowl, particularly Anatidae; and there were plans to use areas around the lagoon for the disposal of domestic sewage.

**Research and conservation:** The fauna and flora of the lagoon are poorly known, and clearly merit further study.

**References:** Departamento de Vida Silvestre (1983).

**Source:** Venecia Alvarez, Jurgen Czerwenka and Sixto J. Inchaustegui.

**Criteria for inclusion:** 2b & 3a.

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**Laguna Salada (Laguna de Bucan de Base) (6)**

**Location:** 17°41'N, 71°28'W; 15 km SSW of Oviedo, Pedernales Province.

**Area:** 200 ha.

**Altitude:** 0m.

**Province and type:** 8.40.13; 07 & 08.

**Site description:** A permanent brackish coastal lagoon, up to 2m deep, with some brackish marshes and mangrove swamp. The water level fluctuates seasonally according to local rainfall.

**Principal vegetation:** Mangroves and brackish marshes; in a region of xerophytic and halophytic plant communities.

**Land tenure:** State owned.

**Protection:** Within the Jaragua National Park, established in 1983 but not as yet fully implemented.

**Land use:** Occasional hunting and fishing; the area is practically undisturbed by man.

**Waterfowl:** A very important area for resident and migratory waterfowl. Breeding species include *Nyctanassa violacea*, *Egretta tricolor*, *E. rufescens*, *Eudocimus albus*, *Plegadis falcinellus*, *Gallinula chloropus*, *Charadrius wilsonius*, *Catoptrophorus semipalmatus* and *Himantopus himantopus*. Up to 440 *Phoenicopterus ruber* have been recorded in recent years, and the species has nested (three small colonies totalling 77 pairs were located in January 1978). *Pelecanus occidentalis* is common year round, and *Anas discors* and a variety of shorebirds are common on passage and in winter.

**Other fauna:** No information.

**Threats:** There is some disturbance from fishing activities.

**Research and conservation:** The avifauna has been studied by Pefa Franjul.

**References:** Pefa Franjul (1978a); Wiley & Wiley (1979); Departamento de Vida Silvestre (1983).

**Source:** Sixto J. Inchaustegui and Ramon O. Sanchez.

**Criteria for inclusion:** 1b & 3a.

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**Laguna de Puerto Viejo (7)**

**Location:** 18°21'N, 70°51'W; 15 km southwest of Puerto Viejo, Azua Province.

**Area:** 694 ha.

**Altitude:** 0m.

**Province and type:** 8.40.13; 01, 03 & 08.

**Site description:** A shallow sea bay with six small islands (Islas de Barrera), mangrove swamps and coral reefs.

**Principal vegetation:** Mangrove swamps; dry subtropical forest with *Prosopis* sp and various cacti on the adjacent mainland.

**Land tenure:** A mixture of state and private ownership.

**Protection:** None.

**Land use:** Fishing and wood-cutting.

**Waterfowl:** The islands are important for breeding *Pelecanus occidentalis* and six species of Ardeidae, and the bay is important for passage and wintering shorebirds and Laridae.

**Other fauna:** An important area for the manatee *Trichechus manatus*. The rich marine fauna includes the crustaceans *Panulirus argus* and *Callinectes* sp, and the molluscs *Strombus gigas* and *Crassostrea rhizophorae*.

**Threats:** Overfishing. The bay has suffered some modification as a result of an irrigation scheme on the adjacent mainland.

**References:** Gonzalez *et al* (1978).

**Source:** Venecia Alvarez and Matilde Mota.

**Criteria for inclusion:** 2a, 2c & 3a.

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**Laguna de Don Gregorio and Laguna de Los Reyes (8)**

**Location:** 18°15'N, 70°15'W; 45 km southwest of Santo Domingo, Peravia Province.

**Area:** 20 ha & 6 ha respectively.

**Altitude:** 5m.

**Province and type:** 8.40.13; 12 & 17.

**Site description:** Two permanent freshwater lakes, up to 6m deep, and associated marshes with rice-growing areas, near the Rio Nizao.

**Principal vegetation:** Marshes with *Typha domingensis*, *Eleocharis* sp, *Neptunia oleracea*, *Ludwigia* sp and *Ceratophyllum* sp; and rice-fields.

**Land tenure:** A mixture of state and private ownership.

**Protection:** None.

**Land use:** Fishing, hunting of waterfowl and freshwater turtles, rice cultivation, and a little sheep grazing.

**Waterfowl:** The lakes support a small population of resident waterfowl and some Nearctic Anatidae occur on migration.

**Other fauna:** The two lakes are the only known locality for a small and heavily exploited population of freshwater turtles with characters intermediate between *Chrysemys decussata vicina* and *C. decorata*. The Medicinal Leech *Hirudo medicinalis* occurs.

**Threats:** Drainage of the marshes for rice cultivation, and indiscriminate hunting and fishing.

**References:** Inchaustegui (1975).

**Source:** Julio Cicero and Sixto J. Inchaustegui.

**Criteria for inclusion:** 2b & 3a.

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**Estuaries of the Rio Higuamo and Rio Soco (9)**

**Location:** 18°27'N, 69°15'W; near San Pedro de Macoris, San Pedro de Macoris Province.

**Area:** Several hundred ha.

**Altitude:** 0m.

**Province and type:** 8.40.13; 02, 08, 09 & 11.

**Site description:** Riverine marshes along the lower courses of the Higuamo and Soco Rivers, and mangrove swamps at the river mouths.

**Principal vegetation:** Mangrove swamps and a great variety of riverine vegetation.

**Land tenure:** Public ownership.

**Protection:** None.

**Land use:** Exploitation of mangroves.

**Waterfowl:** Known to be important for a variety of waterfowl, particularly Ardeidae, but little information is available.

**Other fauna:** The crab *Cardisoma guanhumi* is common.

**Threats:** The construction of a dam on the Rio Soco has modified the vegetation along that river, and the mangroves are being overexploited.

**Source:** Venecia Alvarez.

**Criteria for inclusion:** 0.

Wetlands in Parque Nacional del Este (10)

**Location:** 18°15'N, 68°45'W; southeast of La Romana, Altagracia Province.

**Area:** Unknown.

**Altitude:** 0m.

**Province and type:** 8.40.13; 03, 04, 05, 07 & 08.

**Site description:** Sea coasts with rocky shores and sandy beaches around the island of Saona and on the adjacent mainland, and mangrove swamps, particularly on the mainland coast. There are four small saline lagoons on Saona Island: Laguna Los Flamencos, Laguna Canto de la Playa, Laguna Tortuga and Laguna El Cuerno.

**Principal vegetation:** Mangrove swamps with *Avicennia germinans*, *Laguncularia racemosa*, *Conocarpus erectus* and *Rhizophora mangle*; beaches with the coconut palm *Cocos nucifera*. In a region of subtropical dry forest and subtropical moist forest.

**Land tenure:** State owned.

**Protection:** Included within the Parque Nacional del Este (43,400 ha) established in 1975.

**Land use:** Fishing, particularly for lobsters and conch, also hunting and tourism. There is some slash-and-burn agriculture in the Park.

**Waterfowl:** Little information is available, but *Phoenicopterus ruber* is known to occur as an occasional visitor.

**Other fauna:** The manatee *Trichechus manatus* is an occasional visitor, and the sea turtle *Dermochelys coriacea* nests on the beaches. There are some coral reefs in inshore waters.

**Threats:** Overfishing of lobsters and conch, and hunting of manatees.

**Research and conservation:** Some studies have been carried out on the birds and reptiles of the Park, and a management plan has been prepared.

**References:** IUCN (1982).

**Source:** See references.

**Criteria for inclusion:** 3a.

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Laguna Limon (11)

**Location:** 18°58'N, 68°51'W; 20 km east of Miches, El Seibo Province.

**Area:** 488 ha.

**Altitude:** 5m.

**Province and type:** 8.40.13; 05, 08 & 12.

**Site description:** A permanent freshwater lake, up to 1.4m deep, fringing marshes and some mangrove swamps; separated from the sea by a sand barrier, and fed by several arroyos. There is very little fluctuation in water level.

**Principal vegetation:** Mangrove swamps with *Rhizophora mangle*; beaches with the coconut palm *Cocos nucifera*; and relict stands of *Pterocarpus officinalis*, a species now on the verge of extinction in the region.

**Land tenure:** A mixture of state and private ownership.

**Protection:** Recently included within a Scientific Reserve (Reserva Científica Natural), but this has not as yet been fully implemented.

**Land use:** Fishing; there is also some rice cultivation, harvesting of coconuts, cattle ranching and hunting in the area.

**Waterfowl:** Known to be an important area for resident and migratory waterfowl, but no details are available.

**Other fauna:** The lake supports an important population of the freshwater turtle *Chrysemys decussata vicina*.

**Threats:** The aquatic fauna is not under immediate threat; however, there is a potential threat from the expansion of rice-growing in the area, and there is considerable disturbance from hunting. Deforestation is a problem throughout the region.

**Research and conservation:** Some studies have been carried out on the fauna and flora of the lake.

**References:** Direccion Nacional de Parques (1980); INDOTEC (1980); Alvarez & Bonnelly de Calventi (1983); Mejia & Gonzalez (undated).

**Source:** Sixto J. Inchaustegui and Servio R. Sosa.

**Criteria for inclusion:** 1c, 2b & 3a.

**Laguna Redonda (12)**

**Location:** 19°01'N, 68°57'W; 10 km ENE of Miches, El Seibo Province.

**Area:** 700 ha.

**Altitude:** 0m.

**Province and type:** 8.40.13; 05, 07 & 08.

**Site description:** A permanent brackish coastal lagoon, up to 2m deep, with fresh to brackish marshes, some mangrove swamps, and a narrow connection with the sea. There are slight fluctuations in water level according to the tides.

**Principal vegetation:** Mangrove swamps with *Laguncularia racemosa*, *Conocarpus erectus* and *Rhizophora mangle*; marshes with *Typha domingensis*; coconut palms *Cocos nucifera*; and some *Pterocarpus officinalis*.

**Land tenure:** A mixture of state and private ownership.

**Protection:** Recently included within a Scientific Reserve (Reserva Científica Natural), but this has not as yet been fully implemented.

**Land use:** Fishing; there is some rice cultivation, cattle ranching and hunting in surrounding areas.

**Waterfowl:** Known to be an important area for resident and migratory waterfowl but no details are available.

**Other fauna:** The lagoon supports an important population of the freshwater turtle *Chrysemys decussata vicina*.

**Threats:** The intensive cultivation of rice poses a threat to the wetland habitat, and there is uncontrolled grazing of domestic livestock and excessive disturbance from hunting.

**Research and conservation:** Some studies have been carried out on the fauna and flora of the lagoon.

**References:** INDOTEC (1980); Alvarez & Bonnelly de Calventi (1983).

**Source:** Sixto J. Inchaustegui and Servio R. Sosa.

**Criteria for inclusion:** 1c, 2b & 3a.

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**Estuaries of the Rio Yuna and Rio Barracote (13)**

**Location:** 19°10'N, 69°38'W; on the Bahía de Samana, south of Sanchez, Samana Province.

**Area:** Several thousand ha.

**Altitude:** 0m.

**Province and type:** 8.40.13; 02 & 08.

**Site description:** The estuaries of the Yuna and Barracote Rivers, with extensive mangrove swamps.

**Principal vegetation:** Mangrove swamps.

**Land tenure:** Under public ownership.

**Protection:** None.

**Land use:** Exploitation of mangroves.

**Waterfowl:** No information.

**Other fauna:** The locally endangered oyster *Crassostrea rhizophorae* occurs in the mangroves.

**Threats:** Exploitation of the mangroves for the construction of buildings for the tobacco industry has greatly reduced the extent of mangrove swamp, and caused serious erosion.

**Source:** Venecia Alvarez.

**Criteria for inclusion:** 0.

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**Laguna de Saladilla (14)**

**Location:** 19°39'N, 71°43'W; 6 km southeast of Pepillo Salcedo, Monte Cristi Province.

**Area:** 2,000 ha.

**Altitude:** 0m.

**Province and type:** 8.40.13; 05, 08 & 12.

*Dominican Republic*

**Site description:** A permanent shallow fresh to brackish lake and marshes with some mangroves; separated from the sea by a belt of coastal sand dunes. The salinity is variable, and the water level fluctuates according to flooding in the nearby river.

**Principal vegetation:** Mangroves with *Rhizophora mangle*; marshes with *Typha domingensis*, *Pistia stratiotes*, *Eichhornia* sp, *Ceratophyllum* sp and *Lemna* sp.

**Land tenure:** State owned.

**Protection:** None.

**Land use:** Fishing, and hunting of waterfowl and freshwater turtles. Agriculture in surrounding areas.

**Waterfowl:** An extremely rich area for waterfowl, with a wide variety of breeding, passage and wintering species. Residents include *Podilymbus podiceps*, *Butorides virescens*, *Egretta tricolor*, *Ardea herodias*, *Dendrocygna arborea*, *Gallinula chloropus*, *Porphyryla martinica*, *Fulica americana* and *Jacana spinosa*. Regular non-breeding visitors include *Pelecanus occidentalis*, *Phoenicopterus ruber* and *Anas bahamensis*. A variety of Nearctic ducks occur in winter; the most common are *Anas americana*, *A. discors*, *Aythya affinis* and *A. collaris*, but *Anas acuta*, *A. cyanoptera*, *A. clypeata*, *Aythya americana* and *Oxyura jamaicensis* also occur regularly.

**Other fauna:** *Pandion haliaetus* is a winter visitor. The American Crocodile *Crocodylus acutus* has been recorded on a number of occasions, and the freshwater turtle *Chrysemys decussata vicina* is common.

**Threats:** There is some pollution in the lagoon, and overfishing and excessive hunting are causing problems.

**Research and conservation:** Some faunal surveys have been conducted in the area, and the avifauna is relatively well known.

**References:** Peña Franjul (1977); OEA (1977); Wiley & Wiley (1979).

**Source:** Sixto J. Inchaustegui and Miguel Silva.

**Criteria for inclusion:** 2a, 2b & 3a.

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Cayos Siete Hermanos (15)

**Location:** 19°51'N, 71°49'W; in the Caribbean, 12-25 km west of Monte Cristi, Monte Cristi Province.

**Area:** Several hundred ha.

**Altitude:** 0m.

**Province and type:** 8.40.13; 01, 03, 05 & 08.

**Site description:** A group of seven small sandy islands with some mangrove swamps.

**Principal vegetation:** Mangroves; low scrub with *Batis* sp, *Sesuvium* sp and some cacti; marine vegetation including species of *Penicillus*, *Dictyota* and *Sargassum*.

**Land tenure:** Under public ownership.

**Protection:** Included within a Scientific Reserve established in 1983.

**Land use:** Exploitation of birds' eggs and molluscs.

**Waterfowl:** No information.

**Other fauna:** There are large breeding colonies of the terns *Sterna fuscata* and *Anous stolidus*, and significant numbers of the manatee *Trichechus manatus*.

**Threats:** The tern colonies and mollusc populations are being overexploited, and the terrestrial vegetation has been disturbed by egg-collectors.

**Research and conservation:** Further studies are required to determine the full importance of the islands. It has been recommended that the Monte Chico and Ratas Cays be maintained as Scientific Reserves, and that the other islands be made into a National Park.

**References:** Alvarez (1980).

**Source:** Venecia Alvarez.

**Criteria for inclusion:** 2a, 2b & 3a.