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## Information Sheet on Ramsar Wetlands

1. Date this sheet was completed/updated: April 2000

2. Country: Colombia

3. Name of wetland: Laguna de la Cocha

4. Geographical coordinates:

0° 50' and 01° 15' North latitude  
77° 05' and 77° 20' West longitude

5. Altitude: an average of 2,700 metres

6. Area: approximately 39,000 hectares

7. Overview:

This area is formed by Laguna de la Cocha (Laguna del Guamués), which is of volcanic origin and belongs to the Río Guamués catchment basin. In addition, there are many streams, bogs, azonal paramos and high-Andean forests. Furthermore, it is an area of importance because of ethnic and archaeological considerations.

8. Wetland type:

M, O, U, Xf

Types of wetlands by decreasing order of importance: O, M, U, Xf

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

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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## Bogotá

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

Criterion 1. As a representative, rare or unique wetland: Laguna de la Cocha (Laguna del Guamués) forms one of the most significant wetlands in the southern Colombian Andes and is the largest, forming part of the Amazon basin, located within the Andean cordillera. At the same time, this area fulfils a regulatory function by storing water from its abundant water resources because of the presence of many rivers and streams. Its socio-economic importance is represented by rural activities and tourism on which the local inhabitants depend.

Criterion 2. The wetland sustains vulnerable, threatened and endangered species or ecologically threatened communities. In this area, there are several endangered or vulnerable species, such as the Andean tapir (*danta de paramo*) (*Tapirus pinchaque*), the northern pudu (*Pudu mephistopheles*) and the Andean bear (*oso de anteojos*) (*Tremarctos ornatus*). As for birds, the *zambullidor plateado* (*Podiceps occidentalis*), *pato pico de oro* (*Anas georgica spicauda*), *zarceta roja* (*Anas cyanoptera borroeroi*) and *pato zambullidor* (*Oxyura jamaicensis ferruginea*) are important and all endemic to the area. As for vegetation in the area, there are important plant formations of very humid low montane forest and azonal paramo with bogs and endemic species such as the *frailejón* (*Espeletia cochensis* and *E. schultesiana*).

Criterion 4. The wetland sustains plant or animal species during a critical stage of their life cycle or provides refuge during adverse conditions. This is an important area for several species of fauna. For aquatic birds, especially ducks, it is the habitat of the *zambullidor plateado* (*Podiceps occidentalis*), *pato pico de oro* (*Anas georgica spicauda*), *zarceta roja* (*Anas cyanoptera borroeroi*) and *pato zambullidor* (*Oxyura jamaicensis ferruginea*), all endemic to the area. There are also several species of *caicas* (Scolopacidae), such as the *Gallinago gallinago paraguaiae*, *G. nobilis* and the migratory species *G. gallinago delicata*. In a recent study (Calderon, 1998), a total of 52 bird species were recorded in the area of azonal paramo. As for fish, the *capitán* (*Erempphilus mutisii*) and the *guapucha* (*Grandulus bogotensis*), characteristic of the high-Andean aquatic systems, have been recorded in the area. At the same time, the rainbow trout is found here and is the main fishing resource in the area.

Criterion 5. The wetland regularly sustains a population of 20,000 or more aquatic birds. Despite a lack of data on populations of aquatic birds in Laguna de la Cocha, there are records that this system is the habitat for important species, such as the *pato zambullidor* described under the previous criterion.

### 13. General location:

Laguna de la Cocha is located in the northern part of the Andean-Amazon basin on the eastern slope of the Andes in the southeastern part of the department of Nariño. In political and administrative terms, the region includes the municipio of Pasto, with the capital Pasto being the city closest to the wetlands (23 kilometres northwest of Pasto).

#### 14. Physical features:

**Climate:** The basin of the middle and lower Guamués is within an area of extreme humid climate. According to Corponariño (1994), temperature varies in this area in function of altitude, between 8° and 12° C, with an average of 11.6° C. The rainfall pattern is a single wet season with between 2,000 and 3,800 mm of rainfall, with the period of heaviest rains between April and August and the lightest rains in December.

**Hydrology:** Laguna de la Cocha forms part of the Río Guamués basin, together with its drainage area with a total of 216 square kilometres of which 42 square kilometres correspond to the area of the lake. The upper basin of the Río Guamués belongs to the large Amazon River basin. It is a tributary of the Putumayo River with an area of 225,000 hectares. This basin is made up of three sub-basins: Lake Guamués, Río El Estero and Río Guamués. The sub-basin of Lake Guamués has an area of 24,353 hectares, representing 58 per cent of the total area. There are 17 tributaries of which seven form micro basins (Río El Encano, Quebrada Santa Lucía, Quebrada Quilinzayaco, Quebrada El Laurel, Quebrada San José, Quebrada Motilón and Quebrada Ramos). The sub-basin of Río El Estero has an area of 9,468 hectares and is the main tributary of the Río Negro. The sub-basin of Río Guamués has an area of 8,217 hectares with the main rivers of Quebrada Santa Isabel, Río La Lorianana and Río Guamués.

The dynamic hydrology of the basin is influenced by the Amazon River, which causes high precipitation that adds to the flow of the rivers and streams in the area. As for physical and chemical parameters, the concentration of dissolved oxygen is high, with values between 5.0 and 8.2 mg/l.

In the sub-basin of Lake Guamués, the streams polluted by pathogenic organisms are Río El Encano, Quebrada El Motilón, Quebrada Quilinzayaco and Quebrada San José, which correspond to the area of largest concentration of population.

**Geology and geomorphology:** The geology of the upper basin of Río Guamués is characterized by the presence of the oldest rocks in the department of Nariño, which are metamorphic, intrusive igneous and effusive igneous rocks with origins in the Precambrian to the late Quaternary. There are several hypotheses about the origin of Laguna de la Cocha, but its tectonic and volcanic origins are dominant, which implies that much earlier this sector formed the caldera of a large volcano.

As for the geomorphologic aspects, the following three large units have been identified:

- 1) Erosion: These areas are formed by intrusive and effusive igneous rocks and metamorphic rocks that break the surface in the southern sector and southeast of La Cocha.
- 2) Erosion with glacial origins: This unit occupies the highest parts and its relief was formed by the action of ice. It occupies the area above 3,400 metres in the north and northwestern part of the area and above 3,000 metres in the southeastern part.

3) Accretion: This unit covers land where processes of sedimentation are most important, whose current forms in the region are the alluvial valley of the Guamués, El Estero, El Esterillo, Lorian, Esterillo Pequeño and El Encano rivers and the upper part of Río Pasto and its watershed.

Soils: As for the geomorphology of the upper basin of Río Guamués, there are mountains with slopes at several altitudes and river-lake valleys that cover slightly flat to slightly concave areas subject to flooding.

In the area of the paramo, there is the Oso association and in more flat areas there are soils derived from volcanic ash, with low saturation of bases associated with these environments. In the hillier part, there are soils derived from volcanic ash with hardened horizons at several depths with moderate effective depth. On the hillsides formed by glacial phenomena, there are well-drained deep soils with low saturation of bases associated with a very wet cold climate. In these areas, there is the Tebaida association and consociation. In the middle and higher part of the hillside, there are well-drained deep soils subject to erosion, derived from volcanic ash with hardened horizons at several depths (Typic Placendept).

The Corota association is located near the lake, where the climatic soil regime is aquatic, semi-lacustrine and in places land, where the parent material is formed by pure lacustrine deposits or mixed with mineral sediments.

#### 15. Hydrological values:

The Lake Guamués sub-basin, with an area of 24,353 hectares that cover 58 per cent of the total area, has 17 streams of which seven form micro basins (Río El Encano, Quebrada Santa Lucía, Quebrada Quilinzayaco, Quebrada El Laurel, Quebrada San José, Quebrada Motilón, Quebrada Ramos). The remaining area is an area of direct runoff to Lake Guamués or Laguna de la Cocha.

The water dynamics of the basin is influenced by the Amazon region, which brings high precipitation that adds to the rivers and streams in the area. Laguna de la Cocha has an average flow at the exit of 9.1 cubic metres and at its normal flow of 2.11 metres its volume varies by 92 cubic millimetres.

This system helps regulate flooding of the many rivers and streams in the area. It also has the function of recharging and discharging aquifers by serving as water storage.

#### 16. Ecological features:

The main types of habitat in this ecosystem are a large freshwater lake and systems of bogs. These aquatic environments are characterized by several types of vegetation such as reed beds of *titora* (*Scirpus californicus*) on the edges of the lake and streams, azonal páramos in flooded areas or with a high water table and species such as *frailejón* (*Espeletia* spp.) and forests between 2780 and 3500 metres above sea level.

## 17. Noteworthy flora:

Among the plant formations of these ecosystems and of great importance are azonal paramos in which are found bogs with species such as mosses (*Sphagnum* sp.), fern (*Blechnum loxense*), *frailejón* (*Espeletia cochensis*), *paja de páramo* (*Calamagrostis effusa*), among others.

Other aquatic plants of importance in the lotic and lentic systems are the Cyperaceae in the water with *totorá* (*Scirpus californicus*) and to a lesser extent by *totorilla* (*Juncus bogotensis*). In addition, there are primary forests, where the dominant tree stratum is the *uraco* (*Ocotea guianensis*) and *encino* (*Weinmannia pubescens*) among others. In the shrub stratum, *amarillo* (*Miconia* sp. and *Miconia harlineii*) and *helecho espinudo* (*Ascotrichyum arborium*) dominate. In the herbaceous stratum, the *cuy* fern (*Polypodium* sp.), *horqueta* (*Anthurium* sp.) and *uvo* (*Cavendishia* sp.) dominate. A species becoming extinct is the *pino hayuelo* (*Podocarpus oleifolius*). Other species that have lost populations in several areas are the *naranjo* (*Ocotea* sp.) and *amarillo* (*Nectandra* sp.). In addition, there are in the region many ornamental species of orchids, for example *Masdevallia cucullata*, *M. ensifera*, *M. rosea*, *Odontoglossum crispum lehmanii*, *O. cristatellum* and *O. ramosissimum*, among others.

## 18. Outstanding fauna

As for the land fauna, there have been about 11 species of mammals recorded belonging to the Canidae, Cervidae, Didelphidae, Felidae, Leporidae, Muridae, Mustelidae, Tapiridae and Ursidae families, among which should be mentioned the Andean bear (*oso de anteojos*) (*Tremarctos ornatus*) and the Andean tapir (*Tapirus pinchaque*).

As for the birds in the area of azonal paramos, 52 species in 22 families have been recorded. Among the aquatic birds (Anatidae), there is information about the presence of the species *Anas cyanoptera* and *A. flavirostris* on the left side of the azonal paramo.

Among endangered or vulnerable species, there are three species of mammals that have been recorded in the area: the Andean tapir (*Tapirus pinchaque*), the Andean bear (*Tremarctos ornatus*) and the Northern pudu (*venado conejo*) (*Pudu mephistophiles*). Among the birds, the following species are endangered: the *zambullidor* at Lake Guamués (*Podiceps occidentalis*) and the duck *Anas niceforoi*.

As for the fisheries resources, the *capitán* (*Eremophilus mutisii*) and the *guapucha* (*Grandulus bogotensis*) have been identified. There are also four species of trout in the lake.

## 19. Social and cultural values:

This area plays an important socio-economic role. In the case of the area of influence of Lake Guamués, its economy depends on the farming sector, with livestock-raising being

the most important activity. Another activity is fish culture especially for production of trout in tanks and floating cages.

The region of La Cocha was partly occupied by the Quillacinga ethnic group, and the current population is composed of descendents of that ethnic group. This area is of archaeological importance, because there are vestiges related to the distribution of ceramics of the Piartal complex around La Cocha and in the Valle de Atriz. There are also rock drawings that show Quillacinga rock art. La Cocha is considered a sacred site for purification and fertility by the other indigenous cultures in the area.

#### 20. Land tenure/ownership of:

In the Upper Río Guamués basin, most of the landholders have land titles (68.17 per cent) of the land. The rest of the land (31.83 per cent) is used by owners without title. About 63 per cent of the plots are smaller than five hectares, 13.1 per cent are plots between 5 and 10 hectares, 7.1 per cent are plots that have an area between 10 and 20 hectares, and the remaining 16.5 per cent are properties larger than 20 hectares, which represent 77.3 per cent of the area of the basin.

The lake belongs to the government, and La Corota Island, which was declared a wildlife reserve, is part of the system of national protected nature parks.

#### 21. Current land use:

(a) Land use in the basin is mainly farming and animal husbandry. The agricultural sector is small scale, given the importance of smallholdings and the small-farmer economy oriented to production of goods for self-consumption. Agriculture occupies approximately 7,200 hectares and depends basically on the production of vegetables and growing potatoes, onions and blackberries. Cattle production occupies about 26,000 hectares and is the most important because of its participation both in area and in value. In addition, this area contributes approximately 23 per cent of the value of production in the department from the raising of *cuye* (*Cavia porcellus*).

(b) In the surrounding area or basin, the land use is also for farming and livestock. Other land uses are mining activities.

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

(a) As for water resources, changes have occurred as the result of bacteriological, physical and chemical pollution of the water by proliferation of coliform bacteria and faecal bacteria and changes in the physical and chemical parameters through incorporation of organic and inorganic substances. Likewise, there has been contamination of the water by sediments and transported material, caused primarily by anthropogenic erosion. Another factor of degradation is gradual deforestation of the natural primary and secondary forest, and deterioration of the azonal paramo, produced by indiscriminate cutting, illegal use and inadequate management practices. Likewise,

the agricultural frontier has expanded annually by 625 hectares because of the low availability of farmland.

Furthermore, about 5,461.6 hectares have been identified in conflict with land use from spontaneous colonization, advance of the agricultural frontier, exploitation of the forest and the carrying-out of farming activities on inappropriate soils.

There is also a proposal for development of a multipurpose project for Guamués that would dam the middle Río Guamués, raising the level of the lake for production of electricity and providing water to the city of Pasto. This project is being promoted by a joint public and private company. Under existing regulations, any project, improvement or activity requires an environmental permit from the competent environmental authority; in this case the Ministry for the Environment. A request has been submitted to the ministry for preliminary studies for an environmental study of alternatives, but no request has been submitted for the environmental permit. The ministry will carry out the study, keeping in mind the international character of the area and possible changes that would be produced in its ecology.

Four varieties of trout were introduced in the lake during the 1930s.

(b) In the surrounding area, there are also the conflicts mentioned earlier.

#### 23. Conservation measures taken:

Part of the Ramsar site is protected under the category of Santuario de Fauna y Flora Isla la Corota. This area is administered by the Unidad Administrativa del Sistema Nacional de Parques Nacionales of the Ministry for the Environment. The Colombian government has declared the entire Ramsar site a wetland of international importance under Decree 698 of 18 April 2000, which grants it a protected status. Also within the area, there are several private reserves, which carry out activities of protection, education and research.

#### 24. Conservation measures proposed but not yet implemented:

The Ministry for the Environment approved for the Corporación Autónoma Regional de Nariño (the environmental authority in the area), a project aimed at drafting a management plan for Laguna de la Cocha and the surrounding area, which will be implemented in 2001.

In addition, WWF, with the support of several private and official organizations and at the request of several indigenous and small-farmer communities, is preparing studies for the creation of a large conservation area on the Upper Putumayo-Upper Guamués in order to preserve the rich biodiversity of the region and strengthen the existing cultural processes (WWF).

#### 25. Current scientific research and facilities:

Under the project for drafting of the management plan for this area studies were made to completing gaps in several aspects of the baseline environmental and socio-economic knowledge.

At the same time, a network of private reserves (Red de Reservas de la Sociedad Civil), WWF and the Universidad de Nariño are carrying out research on biodiversity. The Asociación para el Desarrollo Campesino (ADC) is carrying out studies and fieldwork on production systems, biodiversity and sociological aspects (WWF).

#### 26. Current conservation education:

In the area, several environmental education programmes are being carried out aimed at the owners of the private reserves, the community and visitors. These programmes have been developed by public and private agencies, for example Corponariño, Unidad Administrativa Especial del Sistema de Parques Nacionales Naturales, Asociación para el Desarrollo Campesino and WWF. On Isla de la Corota, the park service has a programme of guided daytime visits.

#### 27. Current recreation and tourism:

One of the main activities in the area is ecotourism, which has been promoted by the private reserves and also in the wildlife reserve. There is an infrastructure of hotels and restaurants in the area, and in the reserves there are possibilities for accommodations. Tourism infrastructure in terms of hotels, restaurants and transportation by boats is concentrated in the village of El Encano and in the areas of El Puerto, Santa Clara and San José.

#### 28. Jurisdiction:

Part of this wetland belongs to the government, and part is private. Administration and management of the wetland are the responsibility of several public entities under the Ministry for the Environment, including the Corporación Autónoma Regional de Nariño (Corponariño), the Unidad Administrativa Especial del Sistema de Parques Nacionales Naturales and the Ministry for the Environment.

#### 29. Management authority:

Management of the wetland is carried out jointly by Corponariño (Corporación Autónoma Regional de Nariño), the Unidad Administrativa Especial del Sistema de Parques Nacionales and the Ministry for the Environment through governing body.

Ministerio del Medio Ambiente  
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#### 30. References: