

## Information Sheet on Ramsar Wetlands (RIS)

**1. Date this sheet was completed/updated:**

April 4, 2003

**2. Country:**

Ecuador

**3. Name of Wetland:**

Reserva Ecológica Cayapas - Mataje

**4. Geographical Coordinates:** 1°29'31.7"N, 79°12'8.5"W; 1°02'22.9", 78°,45'12,9"W

**5. Elevation (average and/or max. & min.):**

0 to 35 m

**6. Area:**

44847 ha.

**7. Overview**

The Cayapas-Mataje Mangrove Ecological Reserve (REMACAM, in Spanish), with a surface of 44,847 ha, are located in northwest Ecuador in the Province of Esmeraldas. They are composed of a group of wetlands that make up the largest and best preserved estuarine system of the Southern Pacific coast. Its components include shallow marine waters 3919 ha., estuaries 12767 ha., flooded grasslands 989 ha., freshwater wooded wetlands 702 ha., intertidal wooded wetlands 24.820 ha., and wooded peatlands 1.650 ha.

The studied site lies in a relatively flat area with small elevations reaching up to 35 meters above sea level. The average annual precipitation is 3000 mm, a value that increases inland in the tropical rain forest located within the Chocó biogeographic region, one of the most biodiversity-rich areas of the planet.

The REMACAM area is inhabited by an important Afro-Ecuadorian population of ancestral origin, with a population of 6462. Their main economic activities include fishing and gathering of molluscs and crustaceans, small-scale agriculture and animal husbandry, and more recently, tourism. Ponds for shrimp aquaculture were constructed as part of a large scale entrepreneurial activity before the area was declared as an Ecological Reserve, having had a great environmental and social impact.

**8. Wetland type:**

**Marine - coastal:** *A, F, H, I*

**Continental:** *Ts, Xf, Xp*

**(Explanatory note)**

- a). Ponds for aquaculture have been excluded, because the medium-term goal is to carry out a restoration process that will convert shrimp ponds back to natural wetlands.
- b). Seasonally-flooded agricultural lands and farms located in this terrain are excluded as it is currently not possible to include them in the Ramsar site; it is necessary to conduct a consultation process with participation of all landowners first.

**9. Ramsar Criteria: 1, 2, 3, 4, 8**

**10. Map of site included? Yes**

The map was created by Fundación Natura using GIS, at 1: 50000 scale, ArcView format. The wetlands of the Cayapas-Mataje Reserve cover 44847 ha.

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

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

Due to their location within a wet tropical area, the REMACAN wetlands possess a high primary productivity, due to phytoplankton and the mangrove forest, which has produced a variegated community containing a high species diversity, some endemic, others threatened. Among the latter, species such as *Crocodilus acutus* and caiman crocodiles are found. **(Ramsar Convention Criteria 1 and 3)**. See Flora and Fauna annex.

The wetlands that make up the REMACAM constitute the richest Pacific coastal ecosystem in the Tropics, which is why the Esmeraldas Mangrove ecoregion and the Colombian Pacific coast have been catalogued regionally as highly representative ecoregions with special value for the conservation of global biodiversity. Dinerstein, E. et al (1995) include it as one of the 200 outstanding ecoregions holding representative samples of global biodiversity, an assertion which supports **Ramsar Convention Criterion 1**.

The biotic community of the wetland is severely threatened by pressure from shrimp aquaculture businesses that wish to install extensive ponds for its cultivation, which implies the destruction of a unique natural community, as well as a habitat for vulnerable, threatened or endangered species and for species named under CITES. **(Ramsar Convention Criterion 2)**. See section 18 – Main species of fauna, and Flora and Fauna annex.

The current conservation status for the Mangroves of Esmeraldas ecoregion is relatively stable, yet its integrity is constantly under threat, thus requiring the undertaking of urgent protection measures. Its integration into the National Network of Natural Protected Areas has promoted a better knowledge and valuation of the area. **(Ramsar Convention Criterion 3)**.

Additionally, mangroves are recognized as a habitat for various species of molluscs, crustaceans, and fish, both during their reproductive stages and in their larval and juvenile stages. Mangroves also provide protection for numerous species of birds, reptiles and mammals. (**Ramsar Criteria 4 and 8**).

The inclusion of the wetlands of the REMACAM in the Ramsar List will contribute in consolidating the protection status of the area and will bring about improved support and aid, both national and international, for its effective conservation.

### **13. General location**

The Cayapas Mataje Ecological Reserve is located in the northwestern corner of the Pacific coast of Ecuador, bordering the Colombian Pacific coast. Biogeographically, it is located in the Pacifica province and includes the southern part of the Chocó ecoregion; it also belongs to the northwestern Ecuadorian zoogeographical region.

The site is located in the cantons of Eloy Alfaro and San Lorenzo in the Province of Esmeraldas, between La Tola, La Y de Borbón and the Mataje river in northwest Ecuador near the Colombian border. It is located north of the city of Esmeraldas, while the nearest population center to the Reserve is San Lorenzo, which is accessible both from the Esmeraldas to Borbón road and from Ibarra, the most important city of the northern Sierra, from the Lita to San Lorenzo road. The Reserve is inhabited by an Afro-Ecuadorian population of ancestral origin composed of 29 communities, 1250 families, and a total population of 6462. Most of the region's inhabitants are native to the area

### **14. Physical features**

The Reserve area is composed of a wide range of morphological units including marine and fluvial-marine plains, tertiary sedimentary relieves, and fluvial shapes. The archipelago's distribution is responsible for the formation of a complex estuary system which receives fresh water from the Cayapas and Mataje rivers on its southern and northern ends respectively, and from other fresh water bodies that empty into the area's internal channels. Additionally, numerous entering branches from the sea are present. The whole area is influenced by tides and fluvial-marine sedimentation. The shores of the larger islands exhibit extensive mangrove growths, while floodplains and permanent forests are found inland. The climate is considered as tropical humid. Medium annual temperature is 25.5°C. Precipitation is distributed uniformly over the course of the year, with an annual average of 3000mm, with the eastern zone being the rainiest, with an average precipitation of nearly 400mm. Meteorological stations located in San Lorenzo and Borbón have registered cloudiness levels of 7/8, and a relative humidity of 88%. Potential evapo-transpiration is 1455mm/year. Precipitation exceeds evapo-transpiration during every month of the year. The REMACAM area is mostly made up of humid tropical forest with a transition zone to dry tropical forest, according to the Holdridge system of classification.

### **15. Hydrological values**

This wetland is located in an area that is influenced directly both by tides and the high freshwater flow at the estuary-coastal interface. The wetland is also a highly productive, complex and stable ecosystem, as swampy soils saturated with water, clay, sand, lime, and decomposing organic matter are predominant. The Cayapas and Mataje island-estuary complex is an eco-dynamic system which contributes to the stability of the aquatic mass, and to the maintenance of the coastal profile. The Cayapas river, the most important hydrographical system, originates outside the Reserve and runs for 344 km on the southwest portion of the Reserve. Tributaries contributing to its formation include the

Santiago, Onzole, and San Miguel rivers. Additionally, Cayapas receives contributions near its mouth from the Najurungo, Los Atajos, and Zaspi rivers. The other hydrographical basin is constituted by the Mataje river, on the Reserve's and country's northern border, with a draining surface of 418 km<sup>2</sup>. Other rivers are formed near the coastline at altitudes below than 70m, including the Molina, San Antonio, Nadadero, Chico, Tambillo and Najurungo rivers. Also, the Reserve is surrounded by a large number of estuaries and canals that make up natural subsystems important for the area, both in ecological and economical terms, as they provide for the subsistence of the local population. The most important estuaries include El Viento, Panadero, Casa de Pargo, Caraño, and El Rey, plus the La Caída and Bolívar canals. These rivers, estuaries, and canals provide means for transportation plus water for aquaculture ponds and human consumption.

## 16. Ecological features

The REMACAM wetlands are part of a complex marine-coastal ecosystem made up of a mosaic of water bodies and emerging land areas, not unlike an archipelago. Its native vegetation cover sustains an exuberant biotic community. This grouping of ecosystems gathers rivers, mangrove estuaries, swamps, sandy and limey wetlands, riverine and insular terraces, and wooded peatlands that are connected with tropical rainforest areas on dry land. These include grasslands, shrubs, and antropic formations such as cocoa, coconut and banana plantations. All mentioned ecosystems are interdependent and in constant interaction, which makes their joint conservation a requisite for their preservation. The geographic location of the wetland allows for the existence of a high diversity of plant and animal species of great intrinsic value, and for the goods and services it provides. On the first count, the primary productivity of phytoplankton and the richness of the mangrove forest's ability to support an abundant aquatic and terrestrial fauna are remarkable.

## 17. Noteworthy flora

Communities of *manglillo*, *guandal* and *ranconchal* mangrove, each consisting of numerous species, have been found on river banks, estuaries and canals in the area (See REMACAM flora annex, reproduced from Romero, J.C. et al. 1998). Mangrove species include red mangrove or *pava*, *gateado*, black, button or *jelí*, *piñuelo*, and white mangrove. Other species related to mangroves include *ranconcha* and *nato*. The forested peatland or *guandal* brings together different species of trees that have adapted to swampy soils and varying conditions and can grow in slow-draining seasonally flooded areas. This particular forest type is a sub-type of the tropical rainforest, where vegetation can reach a height of 30 meters. The *guandales* include 53 different species belonging to 39 different families. Some of the better-known tree species include laurel, *yarumo*, *sangre de gallina* (Myristicaceae family), rubber, *carboncillo* (Combretaceae family), and monkey comb; shrubs include *matapalo* (*Ficus bullenei*), *tangaré*, and *caña agría* (*Costus spp.*).

The *manglillo* forest is made up of shrubs and bushes with an average height of 3 meters. This forest type has generally been modified by antropic actions, and its flora is similar to that of the mangrove forest. This community is located in areas of high salinity and low nutrient content, factors that influence their small growth. 12 species of 9 families and 12 genus are found in the *manglillo* forest. Species include *ranconcha* and *frútice* ferns, red, white, button and *pava* mangroves, plus epiphytes including orchids and the *huicundo* bromeliad.

According to the Official Registry No. 148 (16 march 1993) endangered and vulnerable plant species in the area categorized by the Ecuadorian Forest and Natural Areas Institute (INEFAN, in Spanish) as under threat of extinction include *chanul* (*Humiriastrum procerum*), white mangrove (*Laguncularia racemosa*), red mangrove (*Rhizophora mangle*), black

mangrove (*Avicennia germinans*), button mangrove or buttonwood (*Conocarpus erectus*), cabecita (*Perebea xanthochyma*), cuero de sapo (*Parinari campestris*), chewstick or machare (*Symphonia globulifera*), pacora (*Cespedesia spathulata*) and black manwood or guayacán pechiche (*Miconia guianensis*), plus the Panama hat palm known as *paja toquilla* or *rampira* (*Carludovica palmata*). See REMACAM/INEFAN-GEF Management Plan (1999).

### 18. Noteworthy fauna

A total of 400 animal species have been identified – 71 invertebrates and 329 vertebrates (See REMACAM fauna annex).

- Among the invertebrates there are 29 species of bivalves, the most representative being the conchs *Anadara tuberculosa* and *Anadara similis* and other clams.
- 17 species of Gastropoda, with the most important families being: *Naticidae*, *Buccinidae*, *Calyptraidae*.
- 24 species of Crustaceans distributed between 13 families and 17 genus, among them blue, red, ghost, and hermit crabs, plus shrimp. The most characteristic are: blue crab (*Cardisoma crassum*), the red mangrove crab or *guariche* (*Ucides occidentalis*), and the blue crab or *jaiba* (*Callinectes arcuatus*).
- Among the vertebrates: 68 species of fish, distributed in 39 families and 53 genus, with the most valued species being: snook, snapper, white sea bass, black bullhead, *juvel*, mullet, and *canchimala*.
- 14 amphibian species distributed in 5 families and 8 genus, with the most numerous species being *Colostethos spp.* and *Pellucens*.
- 22 species, 14 families and 20 genus of lizards. Most common species include: boa, alligator, caiman, iguana, and turtle.

The Aves class is very well represented. 173 bird species belonging to 45 families and 145 genus have been registered at the site. The most common species include: snowy egrets, great blue herons, spoonbills, pelicans, hawks, woodpeckers, and cormorants. 19 migratory species have been identified, making their homes mostly in the coastal area, in the estuary canals, and in the interior wetlands of Palma Real island.

Mastozoological fauna is composed of 53 species belonging to 20 families and 43 genus; the most significant species include: fishing bat, *tigrillo pinaguero*, nutria, *tatabra*, *guanta*, and *guatusa*. The REMACAM is inhabited by some species considered vulnerable, threatened, or under threat of extinction, such as: nutria (*Lutra longicaudata*), three-toed sloth (*Bradypus variegatus*), jaguar (*Panthera onca*), blue-fronted parrotlet (*Touit dilectissima*), guan or *pava de monte* (*Ortalis erythrogaus*), and crocodile (*Crocodylus acutus*). The CITES Convention prohibits trade of blue and red crabs, shellfish, and female shrimp post-larva. It is important to highlight that mangroves play a vital role in the survival of the local fauna because they are the main primary producers which provide nutrients from decomposing leaves that become part of the detritus, food for shrimp, crabs, clams and small fish. Then, larger fish, birds, and also human beings feed on these animals. Mangroves provide protection to many aquatic species and shelter birds, mammals, and reptiles.

### 19. Social and cultural values

The wetland is of great importance for the province of Esmeraldas, and for the northwestern region of Ecuador in general for its economic, scenic, aesthetic, ethnic-cultural, and educational value. The region is rich in archaeological remains, especially in the La Tolita site, dating from 500 B.C.-500 A.D., and characterized by the richness of their ceramic crafts and metal works including gold and platinum. The majority of archaeological remains are found at the La Tolita-Pampa de Oro site. Mangroves provide for the production of a great variety of crawfish, shrimp, crabs, shellfish (clams and oysters), and fish. The catch of these

species is basic in providing staple foods and nourishment for local families, as well as for consumption in the cities of Esmeraldas, Ibarra, and Quito. Tourism-related activities related to the site's natural beauty, ethnographic, cultural, and archaeological value provide income for the Afro-Ecuadorian population.

Ecotourism is starting to take off in the area. It attracts a different, more demanding type of tourist with a higher environmental and social conscience. These attitudes are compatible with REMACAM's desire to incorporate sustainable economic activities vital to the conservation of the environment and the culture of native peoples and local communities. Some of the most prominent cultural activities in the area include gastronomy, music, and dance. The most outstanding and attractive sites in the area are:

**Estuaries and canals:** water areas surrounding mangrove communities are the biggest attraction in the Reserve.

**Majagual:** an area of majestic and extraordinary mangroves, catalogued as some of the world's highest.

**Afro-Ecuadorian ethnic groups:** unique communities because of their indigenous culture, customs, traditions, and beliefs.

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

Cayapas Mataje Ecological Reserve is part of the National Network of Protected Areas (SNAP, in Spanish) which is in turn patrimony of the state. The Reserve is home to an important black ancestral population. Most inhabitants in this group have land concessions but do not possess deeds for land ownership. Numerous shrimp aquaculture ponds have been installed in the area. The site wetland areas that include estuaries, canals, marshes, and mangroves are Ecuador state property.

## **21. Current land use:**

Open areas have been utilized for cultivation of coconuts, cocoa, heart of palm, manioc, *guanabana* (soursop), sugar cane, guava, lemons, oranges, plantains, mangos, and medicinal plants, among others. Some of the most important economic activities for the local population include fishing, crab and shellfish collection in mangrove areas, and to a lesser degree, animal husbandry. Soil use change for the purpose of installing shrimp aquaculture ponds is of note.

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

- Construction of shrimp ponds both inland and the island network.
- Over-harvesting of bio-aquatic resources: fisheries, collection of shellfish and crabs.
- Population growth: growth of human settlements, plus the need for basic services for the population.
- Establishment of extensive African palm, rubber, and coconut plantations.
- Development of tourist activities without proper planning could cause the destruction of the ecosystem.

## **23. Conservation measures taken:**

The Cayapas-Mataje Ecological Mangrove Reserve was incorporated into the Protected Areas National Patrimony on 16 January 1996 through an executive decision of the Ecuadorian Forest and Natural Areas Institute (INEFAN, in Spanish) due to its natural, cultural, ethnic, archaeological, and landscape value. The objective behind this decision is to protect one of the most outstanding mangrove forests of the Ecuadorian coast, one possessing a large diversity in terms of flora and fauna and a great historical and cultural

value. The Ministry of Environment prepared the management plan with the participation of the local population.

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

The wetlands of Cayapas-Mataje are part of the REMACAM, and thus under the jurisdiction of the Ministry of Environment. The Reserve has a management plan, yet its application is limited by the shortages of staff and technical and operational resources in the local administrative offices.

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

Biophysical and socioeconomic research activities were carried out in preparation for the elaboration of the Reserve's management plan. Research on social-environmental development for proper management of mangrove ecosystems has also been carried out. The La Chiquita research station, managed by the Ministry of Environment, offers facilities for research on flora, fauna, and tropical ecology.

**26. Current conservation education:**

Site administrators have initiated an information and environmental education program in the REMACAN and adjacent areas, with the participation of the local population.

**27. Current recreation and tourism:**

The past few years have seen an increase in recreational tourism, plus several ecotourism initiatives emerging in the area. This constitutes an activity with great potential which can constitute a source of income for the local population and contribute to the overall valuation of the area for conservation.

**28. Jurisdiction:**

Territorial jurisdiction corresponds to the cantons of Eloy Alfaro and San Lorenzo, Province of Esmeraldas. Administrative jurisdiction resides with the Nature Areas and Wildlife Directorate of the Ministry of Environment, and the Reserve Headquarters.

**29. Management authority: (name and address of local body directly responsible for managing the wetland)**

The responsible authority for site management is the Headquarters for the Cayapas-Mataje Ecological Reserve, of the Ministry of Environment. Headquarters are located in San Lorenzo, Province of Esmeraldas. Operationally, it also coordinates with the Biodiversity and Protected Areas Directorate of the Ministry of Environment.

**30. Bibliographical references:**