Information Sheet on Ramsar Wetlands

Translation of official information by Charles Akin.

1. **Date this sheet was completed/updated:** ~June 1993~

2. **Country:** COSTA RICA

3. **Name of wetland:** Refugio Nacional de Vida Silvestre Tamarindo

4. **Geographical coordinates:** ~ 10°19'N 85°50'W ~

5. **Altitude:** ~no information~

6. **Area:** roughly 500 hectares

7. **Overview:**

This wildlife refuge, first created by decree in 1987 and later confirmed by law in June 1990, is formed by an area of approximately 500 hectares of mangroves that in large part are still intact. This area retains many of the fundamental characteristics and all of the species needed for the normal functioning of its special ecosystems where a large number of freshwater and saltwater waterfowl as well as mammals and reptiles live.

Part of this area, Playa Grande, is one of the world's most important nesting sites of the Leatherback Sea Turtle (*Dermochelys coriacea*), the largest of the world's turtles that has been listed as an endangered species in Appendix I of the CITES Convention. The reserve also includes 400 hectares of mangroves.

8. **Wetland type:**

transitional to dry tropical
~E F H I~

9. **Ramsar criteria:** ~3b~

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

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

Dirección General de Vida Silvestre
Ministerio de Recursos Naturales, Energia y Minas
San José

12. **Justification of the criteria selected under point 9, on previous page:** ~no information availabe~

13. **General location:** ~no information availabe~

14. **Physical features:**

This section of the coast presents varied topography.
The soil at the northern edge of the reserve can be divided into four well-defined bands of differing proportions of sand, slope and coarseness. The first band, 0 to 150 metres wide, is light grey, sandy soil. The second band, between 150 and 500 metres, is reddish-brown light clay loam, but covered with scrub vegetation. The third band, between 500 and 600 metres, is a reddish light clay soil used for agriculture. The fourth band is a black-clay soil with periodical river deposits that at time of heavy rains is partially flooded. There are mangroves and pine groves 40 to 60 metres wide. (These are only approximate values because it is difficult to find a limit between the various bands.)

There is a gentle slope towards the marsh that allows water to run off. Nonetheless, there is little run-off, because the ground is very permeable and filled with tunnels dug by crabs that increase infiltration. Vegetation is distributed in function of this slope: along the shore, deciduous plants or species with foliage adapted to a high level of salt mist, surviving better in the broken-down sandy soil (brown to reddish) that retains more water in the upper horizons. Farther back near the marsh, is a transitional zone where mangrove and coastal elements reappear.

Mangroves form where the relief is flat up to the water's edge in the marsh.

Soil humidity increases inland, as the amount of clay and mud increases and as the soil becomes more microporous. This favours abundant, hardy and larger vegetation.

Salinity decreases as the distance from the shore increases because the shore vegetation retains the sea spray and rain washes away salt. In addition, the increased infiltration near the shore reduces the salt in the areas farther away.

The soil's productivity increases towards the marsh and is highest in bands b and c.

There is a band of *cirio* (salty sand or sandstone) below the surface forming a flat layer at 75-100 metres from the beach at a depth of 3 to 3.5 metres. In the mangrove, it is found between 0.7 and 1.2 metres deep. Fifty metres from the

mangrove, it is found at 1.75 to 2 metres in depth. The *cirio* is below the surface and has a thickness of several metres coming to the surface in the mangrove. The water table is usually found in this layer. *Cirio* is sand solidified by the deposition of calcium carbonates which gives the water taken from here a low pH. In the layer of solidified sand, microporosity is greater that in the loam soil.

The greater thickness of the layer of soil closer to the sea is due to the wind's building up greater accumulations of sand during the sedimentation cycle produced by the river. This cycle has created clay and mud deposits. The *cirio* becomes a filter for minerals leached by lixiviation. The excavation of mud by crabs returns minerals to the surface. At the same time, the holes and tunnels of the crabs allow surface water to penetrate carrying organic and mineral materials. Organic and pesticide residues soluble in water contaminate the *cirio*.

The mangrove is a mature mangrove with very little succession. The bands of mangrove species are stable and erosion is minimal. The mangrove populations are old, vulnerable to deforestation, but well established. The Río Matapalo is a short river with little possibility of general flooding, although it does flood a determined area every summer. Erosion is caused by the tides in the estuary, although it is not considered to be a threat and occurs at only a few places. High tides do not cause strong currents, only gradual changes. Low tides reveal thin layers of mud in the mangrove, and there is no erosion. There are fords and small pools, indicators of a good renewal of water without strong currents. These phenomena create a high degree of stability in the mangrove and as a result, there are few areas of succession.

15. **Hydrological values**:

Average annual rainfall is 2,176 mm recorded at the Santa Rosa station, 8 kilometres from the reserve.

16. **Ecological features**:

This area is not subject to monsoons and the westerly winds decrease the monsoon effect.

17. **Noteworthy flora**:

This area was once totally flooded. As a result, there is now replacement vegetation and areas of temporary succession.

The following types of cover can be found:

a) Well-developed coastal forest - Areas that were once

disturbed with rotting tree trunks, but with dense tree coverage of species typical of the coastal area. The highest elevations are 6 to 10 metres. Some areas require thinning and others require a substitution of species. The microclimate is well regulated. The effects of the sea spray regulate shade and humidity. There is a large population of birdlife.

b) Bosquete de Madero Negro - The microclimate is not well regulated and is hot with a high degree of sunlight. There is a fair amount of colonization by thorny plants, lianes and several ground creeping plants.

c) Bosque de Guácimo - There are few species, but a large variety of trees, a well-regulated microclimate, many crabs and fauna.

d) Bosquete de Chapernillo - A young woodland 10-15 metres high dominated by *Lanchocarpus* spp. forming a single woodland.

e) Residual native forest - There are valuable and large trees in a thin well-diversified band at the edge of the mangrove, including: *arcillo*, *ceiba*, *espino negro*, *guácimo molenillo*, *guapinol*, *panamá*, *pochote*, *sabrino* and *tinto*. There is an abundance of wildlife.

f) Areas of abandoned agriculture - There is evidence of former agriculture such as *ayote*, watermelon, rice and sorghum. The soil is fertile and is used for plants requiring a short growing cycle in winter.

g) The estuary - This mangrove is now in very good condition. It was exploited formerly for the cutting of fire wood used in the salt refineries.
The structure of the mangroves in most of its areas is excellent. There are trees that reach 25 and 30 metres in height and 45 cm in diameter. The most prevalent vegetation, about 70-75 per cent, is red mangrove (*Rhizophora mangle*) that is the species that grows the highest and to the largest diameter.
Other frequent species, although less common, are two kinds of Black Mangrove (*Avicenia germinans* and *Avicenia bicolor*), the second species is scarcer, plus *mariquita* (*Conoccarpus erecta*) that grows in less flooded areas, White Mangrove (*Languncularia racemosa*) and a few *mangle piñuela* (*Pelliciera rizophorae*).
The estuary has a main channel more than 2 kilometres long that sometimes divides into two or three secondary channels forming islands of mangrove dominated by Red Mangrove.

18. **Noteworthy fauna:**

The following species are considered threatened within the reserve.

Fish eagle	*Pandion haliaetus*
Great Black Hawk	*Buteogallus urubitinga*
Zone-tailed Hawk	*Buteo albonotatus*
Collared Forest Falcon	*Micrastur semitorquatus*
Roseate Spoonbill	*Ajaia ajaja*
Linnaeus' False Vampire Bat	*Vampyrum spectrum*
American Crocodile	*Crocodylus acutus*
Spectacled Caiman	*Caiman crocodilus*
Yellow-necked Parrot	*Amazona auropalliata*
Brown Pelican	*Pelecanus occidentalis*

19. **Social and cultural values:** ~no information availabe~

20. **Land tenure/ownership of:** ~no information availabe~

21. **Current land use:**

Land use is determined by type of soil, level of protection, landscape value and productivity. The following possible uses are being considered:

Active recreation (including beach and sea activities)
A protected reserve for turtles
Passive recreation and social interaction
Fruit production (avocado, carambola, cacao, citrus fruits, coconut, guava, mango, manzana de agua, papaya, sapodilla and tamarind)
Plants for hedges (*cedro amargo*, *caoba*, *teca* and *pochote*)
Vacation houses
Large constructions (hotels and condominiums)
Sports facilities (sports fields)
Crop protection

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

1) Desarrollo Playa Grande (approved)
   313 residential and condominium lots

2) Centro Turístico Mario Rina (not approved)
   5.5 hectares for 40 vacation houses

3) Centro Ecológico Pueblo Tropical (not approved)
   30 hectares including a hotel for 972 occupants, 107 vacation homes and 20 condominiums

4) Residencial Ecológico Playa Tortuga (not approved)
   20 hectares of 100 residential lots and an apart-hotel for 120 persons

5) Residencial Tamarindo Beach (approved)
   35 hectares including 175 residential lot, a hotel for 980 persons and recreational and service areas

6) Vista Capitán (approved)
   32 hectares (This development is outside of the shore area.)

7) Puesta del Sol (approved)
   9.5 hectares of residential development including condominiums, restaurants and recreational areas

8) Bahía Tamarindo (approved)
   570 lots for 290 residences, 3 hotels, 300 condominiums and commercial areas

23. **Conservation measures taken:**
In June 1990, the Refugio Nacional de Fauna Silvestre Tamarindo was created.

24. **Conservation measures proposed but not yet implemented:**
~no information availabe~

25. **Current scientific research and facilities:**
~no information availabe~

26. **Current conservation education:** ~no information availabe~

27. **Current recreation and tourism:** ~no information availabe~

28. **Jurisdiction:** ~no information availabe~

29. **Management authority:** ~no information availabe~

30. **Bibliographical references:** ~no information availabe~