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## Information Sheet on Ramsar Wetlands

1. Date this sheet was completed/updated:  
September 2002.

2. Country:  
Costa Rica

3. Name of wetland:  
Turberas de Talamanca

4. Geographical coordinates:  
09°30'N, 83°42'W

5. Altitude:  
Generally speaking, there are altitudes ranging between 700 to 3821 meters. However, peatlands are found between 2600 to 3290 meters.

6. Area:  
192 520 hectares.

7. Overview:

These high mountain wetlands are located in the Talamanca mountain range, distributed among the Chirripó National Park, the Cerro de la Muerte, the Los Santos Forest Reserve, and the Tapantí National Park-Macizo de la Muerte. It is a heterogeneous area in terms of environments and ecosystems, which has conditioned the development of numerous vegetative associations, such as peatlands and *paramos* typical of the Andean region.

The area encompasses Chirripó National Park, which includes the country's highest mountain of the same name, at 3820 metres above sea level. Some extremely interesting geomorphological discoveries have been made in Chirripó, including varied U-shaped glacial forms, tills (*morrenas*), glacial terraces, lakes, and cirques. There are 5 areas of great geological, biological and scenic importance in the higher regions of the park: the Savannah of Lions, the Valley of Rabbits, Chirripó Mountain, the Valley of Tills (*Morrenas*), and the Valley of Lakes.

Four other protected areas are included in the site, including: Tapantí National Park, and Los Santos Forest Reserve, containing the Biological Reserve of Cerro las Vueltas. Taken together they make up an immense biological corridor that allows species, especially fauna, to move both altitudinally and longitudinally in search of food and

suitable reproduction sites. Additionally, it constitutes the country's most extensive forest mass, including its largest concentration of oak trees.

8. Wetland type:  
Inland: **M, Tp, U, Va**

9. Ramsar criteria:  
1, 2.

10. Map of site included?  
Yes.

11. Name and address of the compiler of this form:  
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Revision: National Wetlands Program SINAC-MINAE

12. Justification of the criteria selected under point 9, on previous page:  
The exuberance of the tropical mountainous forests, also known as cloud forests, the presence of almost 90% of the Central American *paramo*, a rare ecosystem with high potential for endemism and medicinal uses, are some of the many natural riches located within the Talamanca mountain range.

Thus, this type of wetland is of great importance, as it is exclusive and characteristic of the Talamanca mountain range. Another important factor is the presence in the area of the highest elevations in the country, hence the diversity of habitats found there, ranging from rainforest to peatlands and *paramos* in the highest areas. These characteristics make it unique within the country. For all these reasons, the conservation of the *paramo* is vital, as it is a resource of great scientific interest for its medicinal potential and present over much reduced areas

*Paramos* are inhabited by a great variety of fauna, including various endangered species, plus others with very reduced populations, which makes them areas of great importance for conservation. It is also worth mentioning the presence of numerous lagoons and streams in the area that make up river basins of great importance, both to wildlife and humans.

The level of endemism reaches approximately 27% of species in all taxonomical groups; however, the floristic diversity is low if compared with other ecoregions at lower altitude.

13. General location:  
Chirripó National Park is located in the Talamanca mountain range, 20 km. due northeast from San Isidro de El General. Tapantí National Park-Macizo de la Muerte is

located in Paraíso, province of Cartago. The Los Santos Forest Reserve (also known as "Cerro de la Muerte") and the Cerro Vueltas Biological Reserve are located in Dota, province of San José.

#### 14. Physical features:

Chirripó National Park has an extremely variable and unpredictable climate, particularly dependant on altitude and slope. In general terms, it is very humid between the months of May-December, turning dry and sunny between January-April. Rainfall reaches at least 3200mm/year, but is estimated to be as high as 6000 mm/year in some parts. The highest areas are subject to strong winds, frost, frequent drizzles, and sudden changes in temperature. The lowest temperature ever recorded in Costa Rica (-9°C) was registered in Mt. Chirripó. Tapantí National Park-Macizo de la Muerte is known as one of the rainiest regions of the country, with an annual precipitation of more than 6500mm, with rainfalls reaching as much as 8000mm/year. The period of highest precipitation lies between the months of May-October.

#### 15. Hydrological values:

Chirripó National Park contains one of the most interesting geomorphological discoveries in Costa Rica – the sculpted U-shaped glacial forms, *morrenas*, glacial terraces, lakes, and cirques that give testimony of the passing of large ice sheets extending for no more than 2 or 3 kilometres.

The area protects the upper basin of the Chirripó Pacífico River, a tributary of the great Térraba river basin. Likewise, the upper basin of the Chirripó Atlántico River is a tributary of the Matina River. The protection of these river basins, which include numerous streams and springs, provides good quality water for downstream use by local inhabitants. Its utilization includes domestic, agricultural, industrial, recreational, and hydroelectric uses.

It is important to mention that the area of Tapantí National Park-Macizo de la Muerte is traversed by the Grande de Orosí River, which has a large number of tributaries and provides important goods and services for Costa Rican society. The hydric system is extremely important in the generation of hydroelectric power and for supply of potable water for a large part of the country's metropolitan area.

#### 16. Ecological features:

The ecoregion where Turberas de Talamanca is located presents great climatic, edafic, and topographic variability, making it very heterogeneous in terms of environments and ecosystems. Also, due to its geographic location, the Talamanca mountain range protects diverse ecosystems including *paramos*, peatlands, meadows, non-forested grasslands, cloud forests, and rainforest, the two latter composed of high-mountain oak forests.

*Paramos* are located at altitudes between 2900-3100m, and contain mostly flora of Andean origin – very short and mixed, made up of shrubs, grasses, and herbaceous perennial plants. One of the most common species is the chusquea or cañuela batamba (*Chusquea subtessellata*). The region is host to interesting vegetation made up of a mixture of neotropical floral elements, holartic plants, and some endemic species. Local flora presents important adaptations to extreme conditions, including climatic seasonality and high solar radiation.

Peatlands present in the area are of great importance since they possess a high productivity and are sites of aquifer recharge where a large number of plants and animals adapted to extreme climatic conditions are found. Another ecosystem present is the much colder and damper cloud forest. Here, oak, and encino trees with a height of up to 50 meters are found. The trees are characterized as evergreen, with stunted treetops, coriaceous leaves, and acorns as fruits. The cloud forest is also characterized by a high content of arborescent ferns, mosses, bromeliads, palms, and orchids (several listed by CITES), distributed over different strata in the forest.

#### 17. Noteworthy flora:

In high altitude wetlands it is possible to find various types of plant communities, many of which are common in other countries in Latin America, most notably *paramos*, peatlands, and oak forests. With respect to the *paramo*, its vegetation is composed of gramineous, Ciperaceae, Asteraceae, Juncaceae, Ericaceae; while inundated peatlands contain Ciperaceae, Juncaceae, Ericaceae, *Sphagnum* and “cushioning” plants, including *Distichia* and *Plantago*. Oak forests are characterized by the dominant species *Quercus*, as well as other species including *Clethra*, *Ilex*, *Styrax*, Lauraceae, and Araliaceae, with numerous epiphytes present. Other indicator species include: *Pernettya coriacea*, *Vaccinium consaguineum*, *Puya dasylirioides* y *Sphagnum* spp. According to a study carried out in the peatland areas of the Talamanca mountain range the most common plants found there include the large ferns *Blechnum loxense* and *Blechnum buchtienii*, the *Pernettya coriacea* of the Ericaceae family, *Sphagnum* spp moss, *Xyris subrelata* of the Xiridaceae family, and *Carex bondplandii* of the Ciperaceae family. The same study points out other notable species, including the chusquea bamboo *Chusquea subtessellata*, *Puya dosylirioides* of the Bromeliaceae family, and the Asteraceae *Senecio costaricensis*. It is also worth mentioning that the *Podocarpus* pine is also an endemic species to the ecoregion. The most notable epiphytes include bromeliads and orchids. There is a high level of local and regional endemism in this respect; there are continuing reports of new bryophytes and ferns. In terms of mushrooms present there is also a high endemism in terms of species, especially coming especially from the Boletaceae group. The ecoregion possesses the largest diversity of Bryophytes and a high level of endemism within this group, including the largest population of stemmed bryophytes. Angiosperm indicator species include: *Quercus corrugata*, *Cornus disciflora*, *Podocarpus macrostachys*, *Brunelia costaricensis* and *Viburnum costaricanum*. In the cloud forest the most common oak species is the *Quercus costarricensis*, listed as vulnerable in the IUCN Red List. Likewise, the genera *Styrax*, *Ocotea*, *Magnolia*, *Weimannia*, *Podocarpus* and others, each with different species present in the Red List are also found.

## 18. Outstanding fauna:

With respect to the herpetofauna found in the *paramos* of Costa Rica, four orders in two classes of Amphibia have been found: Gymnophiona, Caudata and Anura; Reptilia: Squamata, Lacertilia/Sauria and Serpentes; including 10 families, 12 genera and 18 species. The majority of the species have been registered near the Cerro de la Muerte (3100 m altitude), while others have been reported in Cerro Chirripó. The genera *Bolitoglossa* (salamanders), *Eleutherodactylus* (leptodactylous frogs) y *Rhadinaea* (pine woods snake) represent the richest genera in terms of species, as three have been identified for each. As there are still significant gaps in knowledge about amphibians and reptiles inhabiting the Costa Rican *paramo*, it is recommended that efforts in inventorying of the herpetofauna is intensified, as there is the threat of extinction for different groups living at high elevations due to climatic change. Amphibians in particular require an increase in scientific research about them. There are nearly 45 species of mammals present in the site, including several under threat of extinction, or possessing reduced populations. These include the tapir (*Tapirus bairdii*, IUCN Red Listed), some felines included in CITES Appendix II such as the puma (*Felis concolor*), the ocelot or *manigordo* (*Felis {Leopardus} pardalis*), and the jaguarundi (*Herpailurus yaguaroundi*); the forest rabbit (*Sylvilagus brasiliensis*), the northern raccoon (*Pocyon lotos*), the white-faced capuchin monkey (*Cebus capucinus*) and the *cabro de monte* or red brocket deer (*Mazama americana*) the latter also present in the Red List. The *paramo* is host to at least 25 species of birds, the most common being the *Junco Volcánico*, *escarchero* or sooty robin *Turdus nigrescens*, *Buteo jamaicensis*, and the *Slaty flowerpiercer*. Also present in the site is the largest population of quetzal (*Pharomachrus mocinno*) in the country; black-faced solitaire or *jilguero* (*Myadestes melanops*), as well as several species of hummingbirds (*Amazilia* sp.), toucans (*Ramphastus* sp.) and climbers, among others.

## 19. Social and cultural values:

The area is of great importance in terms of indigenous culture, as the largest indigenous group in the country, the Bribri. The surrounding populations are made up of scattered settlements, nearly all of which are located near the southern Pan-American Highway. Their structure usually contains a school, a church, and a sports field. In many of these communities, and most notably within the poorest families, the lack of economic resources and institutional support makes them use the natural resources (non-wood) from the oak forest for subsistence. An example is the extraction of moss from oak trees, which is then packaged and sold directly or through intermediaries, most notably around the Christmas season. Another example is the making of charcoal from old or fallen oak or encino trees found in pasture lands. Also, the cultivation and gathering of blackberry is another activity developed in certain areas, which has come to substitute the production of charcoal due to a lack of raw materials. More recently, the cultivation of fruits such as apples, apricots and passionflower fruit *granadilla* has increased. Milk farming, reforestation, vegetable production, and ecotourism are some of the activities undertaken by families possessing more resources. Ecotourism activities have motivated many of the local inhabitants into conserving and discovering that protection

of flora and fauna constitutes a development strategy, since protected areas attract tourists. They in turn bring money to a region, which translates into jobs being generated for the local population. It also has the effect of giving an incentive to the government and locals, and helps to stop deforestation, illegal hunting and burning of fields. Local government and residents from the area are now aware that if nature areas disappear, so will tourists and the resources they generate.

20. Land tenure/ownership of:

Approximately 70% of the land is property of the state, while the remaining 30% is private property. Lands belonging to the state have most of the original cover, whether oak forest, *paramo*, or other ecosystems present. Private properties also include various forest areas, as well as crops and livestock, mostly in Los Santos Forest Reserve.

21. Current land use:

Tapantí-Macizo de la Muerte National Park, Chirripó National Park, Río Macho Forest Reserve and Cerro las Vueltas Biological Reserve are all mostly state property, while the opposite is true for Los Santos Forest Reserve. Main uses developed in the buffer zone of these protected areas include planting of crops (coffee, apples, strawberries, and flowers), other fruit and forest plantations, *cabuyales*, tall grass pastures, and *paramos*. Milk farms have also emerged in the area. Another commercial activity in the area is the raising and fishing of trout. A fish farm located in Ojo de Agua, Villa Mills, supplies the region with trout.

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

One of the ongoing problems in the area is the pollution of rivers due to the use of agrochemicals from agricultural activities such including the growing of apples, potatoes, cabbage, onions, and strawberries. Another negative factor that affects the site is forest fires. Other important adverse factors have been cited, including the climatic conditions (low temperatures, cloud coverage, high precipitation), uneven terrains, soils not favourable for intensive agriculture, land overuse, limited productive infrastructure, few rural roads in good condition, scattered population centres, lack of job opportunities, and scarcity of remunerated productive activities, among others. Another important factor is the lack of control of trout populations from fish farms, which can migrate into the rivers. Oak forests bordering the Pan-American Highway have been severely degraded by logging operations and for production of charcoal.

23. Conservation measures taken:

The creation of protected areas has played an important role with respect to the reduction of deforestation in the region. The site is host to the following conservation areas: Río Macho Forest Reserve, Los Santos Forest Reserve, and the Tapantí-Macizo Cerro de la Muerte, Chirripó, and La Amistad National Parks. These National Parks and a series of Indigenous Reserve Areas also make up the La Amistad Biosphere Reserve.

Other projects and programmes in the site include:

- Río Savegre River Basin Management, financed by Proyecto Araucaria (Government of Spain).
- Río Reventazón River Basin Management, financed by various public institutions.
- Formulation of decree for expansion of Cerro Vueltas Biological Reserve by 600 hectares.

24. Conservation measures proposed but not yet implemented:  
None.

25. Current scientific research and facilities:

Various higher education institutions have properties and facilities in the area, among them CATIE, the Universidad Nacional (UNA) and the Universidad de Costa Rica (UCR), allowing them to develop various research projects. Notable examples include CATIE's Villa Mills Research Station, UCR's Tres de Julio Reserve, and FUNDECOPERACION/MINAE's Macizo de la Muerte ecotourism project.

26. Current conservation education:

Activities with local primary and secondary schools include composting, talks on wetlands, micro-basin reforestation projects, solid waste projects, and teacher training in environmental topics, all sponsored by MINAE and with the support of the Instituto Costarricense de Electricidad (ICE) on some reforestation projects.

27. Current recreation and tourism:

A number of small local entrepreneurs carry out or offer various services and activities for tourists and other visitors, in the following sectors: restaurants, lodging, sports fishing, horseback riding, hiking, nature visits to waterfalls and primary forest, research, arts and crafts, fruit plantations and production of a great variety of edible goods.

28. Jurisdiction:

Private property and state property.

29. Management authority:

The responsible authority is the Sistema Nacional de Áreas de Conservación, of the Ministry of Environment and Energy (SINAC-MINAE). The site is located within two different conservation units (areas), which are considered as the local authorities, namely:

- Amistad Pacífico Conservation Area (*Área de Conservación*):  
Chirripó National Park, Río Macho Forest Reserve, Tapantí-Macizo de la Muerte National Park.
- Pacífico Central Conservation Area (*Área de Conservación*):  
Los Santos Forest Reserve and Cerro las Vueltas Biological Reserve.

30. References: