

# United Nations Environment Programme World Conservation Monitoring Centre



## World Heritage Sites

Protected Areas and World Heritage





## AREA DE CONSERVACIÓN GUANACASTE COSTA RICA

The Area de Conservación Guanacaste is a mosaic of national parks, forest reserves, wildlife refuges and offshore waters which protects an entire 105 km gradient from mangroves and dry forest on a coast with upwelling currents, coral colonies and reefs, to cloud forest at 2,000 metres and high level Atlantic rainforest. It has sufficient habitats, elevational and climatic, to support at least 60% of the species of Costa Rica, both now and in a warming future climate. Its Pacific tropical dry forest is the largest and best preserved left in MesoAmerica, and has several rare and endangered species.

#### COUNTRY

Costa Rica

#### NAME

Area de Conservación Guanacaste

#### NATURAL WORLD HERITAGE SERIAL SITE

1999: Inscribed on the World Heritage List under Natural Criteria ix and x.2004: Extended by the Santa Elena property under the same criteria.

## STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]

#### INTERNATIONAL DESIGNATIONS

1999: Laguna Respringue and Manglar de Potrero Grande designated Wetlands of International Importance under the Ramsar Convention (75 ha and 139 ha).

## **IUCN MANAGEMENT CATEGORY**

Rincón de la Vieja National Park:

Santa Rosa National Park:

Guanacaste National Park:

Il National Park

Il National Park

Bahia Junquillal National Wildlife Refuge: IV Habitat / Species Management Area

Horizontes Experimental Forest Station: Unassigned

## **BIOGEOGRAPHICAL PROVINCE**

Central American (8.16.1)

## **GEOGRAPHICAL LOCATION**

Located in northwestern Costa Rica approximately 120 km north of Puntarenas. The site extends from the volcanic ridge of the Cordillera de Guanacaste to 6 and 12 km out to sea off the south coast of the Santa Elena peninsula. It covers much of the rectangle defined by the co-ordinates 10°44′ - 11°06′N and 85°15′ - 86°00′W.

## DATES AND HISTORY OF ESTABLISHMENT

- 1971: Santa Rosa National Park created by Executive Decree 1562-A, including 12 km out to sea; extended in 1977 and 1980;
- 1974: Rincon de la Vieja National Park established by Law 5398 and Executive Decree 8493;
- 1987: Santa Rosa National Park provisionally extended over the Hacienda Santa Elena property, including 6 km out to sea and six offshore islands (Islas Murcielagos), to be ratified later;

1987: Horizontes Experimental Forest Station donated to the Fundación de Parques Nacionales;

1989 &1991: Guanacaste National Park and the Area de Conservación Guanacaste established by Executive Decrees 19124 & 20516 consolidating several existing protected areas;

1995: Bahia Junquillal National Wildlife Refuge created by Executive Decree 23867;

2004: The Santa Elena property (16,000 ha) along the south side of the Santa Elena peninsula absorbed into Santa Rosa National Park on the resolution of the expropriation case between its private owners and the State.

#### LAND TENURE

State owned, except for part of the mountain corridor Pitilla-Orosi-Cacao, owned on nomination by the parastatal NGO Fundación de Parques Nacionales (FPN). Small peripheral areas are periodically bought and added to the site. Administered by Technical, Local and Regional Committees and the National System of Conservation Areas (SINAC) of the Ministry of Environment & Energy (MINAE).

#### **AREA**

147,000 ha: 104,000 ha of terrestrial areas plus a 43,000 ha marine area (UNESCO & IUCN, 2004). The following figures are taken from the nomination:

Santa Rosa National Park:	40,357.8 ha
Guanacaste National Park:	37,365.0 ha
Rincón de la Vieja National Park:	14,084.0 ha
Horizontes Experimental Forest Station:	7,317.3 ha
Bahia Junquillal National Wildlife Refuge:	438.7 ha
Santa Rosa Marine Area:	43,000.0 ha

#### ALTITUDE

From below sea level to 1,916m (Volcán Rincon de la Vieja).

## PHYSICAL FEATURES

The site comprises much of the western side of the Cordillera de Guanacaste, the peninsula of Punta Santa Elena with the Santa Rosa plateau and a varied coastline plus part of the wide intervening coastal lowlands. The mountains peak in the largely inactive volcanoes Orosi, Cacao and Rincon de la Vieja (1,916m). The last has three craters, each displaying collapse characteristics, and a crater lake. Its last, minor, eruption was in 1998 and fumaroles are still active in one of the craters. At its base are several 0.5m-10m pot craters (pailas) bubbling with mud. Million year-old volcanic rock high in calcium carbonate underlies the region except for the Santa Elena peninsula, the western end of which is geologically unique: 24,000 ha of serpentine barrens supports a habitat that has been above the sea for 85 million years on an island in the eastern Pacific long before the Central American isthmus was formed. Its connection with the mainland was buried beneath more recent volcanic flows. The area is scenically beautiful, particularly the Murcielago coast of Punta Santa Elena.

The land is well watered by at least 32 rivers and 16 intermittent streams originating on the volcanoes, several flowing into the Rio Tempisque, which is essential to the irrigation of the agricultural south of the province. Laguna Respingue, a 75 ha wetland on the south coast of Punta Santa Elena, is the only freshwater wetland on the Pacific coast of Costa Rica, in an area with the driest climate in the country. It is formed by eroded alluvial soil washed down from the slopes behind and held in place by a steep raised cobble barrier beach that protects it against the high waves from the Pacific during the rainy season when it forms a swamp with an area of open water. Powerful dry season winds have created very high dunes, which are in pristine condition since the site is relatively undisturbed because of the difficulty of access, which clearly show the interaction between the coastal forest and the shifting sands. Manglar de Potrero Grande is a 139 ha nearly pristine mangrove forest of uncommon alluvial origin also on the south coast of the Santa Elena peninsula immediately next to an area of dry forest.

The marine zone is the most intact inshore Pacific marine ecosystem between the Panama Canal Zone and Mexico, preserved by its rockiness, with major nutrient-rich cold upwelling currents offshore, creating high productivity at the surface (IUCN, 1999). It includes some 8-10 mostly

uninhabited near-shore islands and islets (the Islas Murcielagos), deep water, rocky coasts, raised cobble beaches, sandy beaches, dunes which are highest and densest on the Santa Elena peninsula, and approximately 20 km of turtle nesting beaches. More specific habitats include rock fields, rocky reefs, coral reefs, algal beds, sandy bottoms, and areas of upwelling currents. The site possesses, in the 1.7km-long Nancite beach, a locale where thousands of olive ridley sea turtles nest simultaneously in major waves of arrivals called *arribadas* and is one of the few protected *arribada* beaches for this species on the Mexican and Central American coasts. The site also contains two nesting beaches of the highly threatened leatherback turtle.

#### CLIMATE

The climate is hot tropical wet from mid May to mid December and very dry the other half of the year, the result of lying athwart the northeast trade winds and in the rainshadow of the central mountains. At the Santa Rosa weather station the average annual rainfall is 1,528mm, with considerable annual variation between 800 and 2,800mm. The mean annual temperature is 28°C measured at the station. The hottest months are April and May. The cloud-covered mountain areas are cooler and more humid. The area has very strong winds in winter and the seas are subject to violent offshore currents.

#### **VEGETATION**

The Conservation Area is in a relatively unexploited region with very varied topography and climate where Nearctic and Neotropical floral realms overlap, It contains an altitudinal transect which includes entire river basins that protects an 105 kilometre east-west gradient from the relatively intact but elsewhere degraded or severely threatened Pacific coast dry forest to cloud forest 2,000 metres above it and to Atlantic rainforest on the Cordillera's upper eastern slopes. The whole area is believed to have more than 7,000 species of plants (UNEP-WCMC, n.d.).

Eight forest life zones (*sensu* Holdridge) occur within the site: Dry Forest; Humid Tropical Forest; Premontane Very Humid Forest; Humid Tropical Transitional to Premontane Forest; Premontane Rainforest; Lower Montane Rain Forest; and Very Humid Tropical Transitional to Premontane Forest. The Dry Forest of about 60,000 ha is the only fully protected complete such ecosystem in Mesoamerica, of at least 20 distinct plant associations growing on different types of soil, alluvial, limestone, recent and ancient volcanic, serpentine, and on different degrees of slope and exposure to wind. Five species each of rare cacti and bromeliads exist there. It is a lowland vegetation but the altitudinal gradient behind it provides a present seasonal and perhaps a future permanent biotic refuge for dry forest species in a warming climate. However, only protection of a sufficient extent will preserve it from encroachment, grazing, set fires, and the destruction customary in this biome.

The Area's main vegetation types include: (a) mixed deciduous forest with *Calycophyllum candidissimum, Bombacopsis quinatum* and *Luehea candida* among the dominants, with fig trees *Ficus* spp.,rosewood *Dalbergia retusa*, mahogany *Sweitenia macrophylla* and lignum vitae *Guaiacum sanctum* (EN) also present; (b) evergreen gallery forests along streams and behind the occasionally flooded zone *(estero);* (c) savannas with African jaragua grass *Hyparrhenia rufa* and scattered trees of *Byrsonima crassifolia* and *Curatella americana;* (d) oak forests and savannas with *Quercus oleiodes* dominant; and (e) mangroves *Rhizophora mangle, Avicennia nitida, Conocarpus erectus* and *Laguncularia racemosa.* There is also beach vegetation, and areas of calabash *Crescentia* sp. forest. The savanna is the area most vulnerable to clearance in the past and is now fast being reforested both by man and by natural increase. 100 species of trees are recorded in the area. (UNEP-WCMC, n.d.).

The volcanoes form a group of ecological islands above the plain. On Rincon de la Vieja, four different forest types are present: (a) Tropical Wet Forest with *Quercus* spp. on the poor and eroded soils, with *Spondias* spp., *Achras sapota, Cedrela adorata, Rhedia edulis* and *Enterolobium cyclocarpum*; (b) Premontane Moist Forest, which is very species-rich; (c) Premontane Rainforest on very rough topography; and (d) Lower Montane Forest where stands of *Clusia* spp. occur, mixed with a few other species including palms. This forest is cloud-covered all year and the trees are dwarfed by the prevailing strong winds and sandy soils. More than 50,000 species of fungi are recorded.

Punta Santa Elena has important areas of well conserved primary dwarf dry forest, a very ancient habitat dating back 85 million years, which is exceptionally rich in plants that occur only here and are highly specialized to live on the very dry and ancient serpentine soils. In Manglar de Potrero Grande

it has a near-pristine mangrove forest of unusual alluvial origin with eight species of mangrove. The site is recovering successfully from exploitation that ended only in 1977 with the establishment of forest reserves. It is exceptionally intact being difficult to reach and with few human uses except for sporadic tourism. This association of wetland ecosystems flanking very dry forest separated by only tens of metres is unique. The site as a whole contains 37 wetland areas, among them, major wetlands such as the Puerto Soley, Cuajiniquil, Santa Elena, Nancite and Playa Naranjo mangrove complexes; also the Laguna del Limbo, Iguanito Estuary, and Rincon de la Vieja crater lake. The vegetation of Laguna Respingue is dominated by *Phragmites australis*.

#### **FAUNA**

The Conservation Area lies on a major intercontinental convergence of Nearctic and Neotropical species and, excluding bacteria and viruses, contains approximately 235,000 species. With its transect from coast to cloud forest it contains a very diverse fauna with 940 vertebrate species, several of conservation concern. Some notable mammals are spectral bat *Vampyrum spectrum*, (one of 40 species of bat), collared anteater *Tamandua tetradactyla*, red-bellied spider monkey *Ateles geoffroyi frontatus* (VU), white-throated capuchin monkey *Cebus capucinus*, mantled howler monkey *Alouatta palliata*, jaguar *Panthera onca*, jaguarundi *Puma yagouaroundi*, ocelot *Leopardus pardalis* and margay *L wiedii*. Central American tapir *Tapirus bairdii* (EN), white-lipped peccary *Tayassu pecari*, collared peccary *Pecari tajacu* and white-tailed deer *Odocoileus virginianus*.

The avifauna has more than 500 species. The following are among the commonest: thicket tinamu *Crypturellus cinnamomeus*, white ibis *Eudocimus albus*, blue-winged teal *Anas discors*, crested guan *Penelope purpurascens*, jabiru stork *Jabiru mycteria* (VU), roseate spoonbill *Platalea ajaja*, laughing falcon *Herpetotheres cachinnans*, great curassow *Crax rubra* (VU), spot-bellied bobwhite *Colinus leucopogon*, double-striped thick-knee *Burhinus bistriatus*, and mangrove hummingbird *Amazilia boucardi* (EN). Parrots including the military macaw *Ara militaris* (VU) are plentiful, and the great green macaw *Ara ambigua* (EN) occurs but only rarely, on Rincon de la Vieja.

In the estuaries spectacled caiman *Caiman crocodilus* and American saltwater crocodile *Crocodylus acutus* (VU) are seen. On the Naranjo and Nancite beaches during the breeding and mating season from August to December, over 250,000 turtles arrive to nest. The majority are olive ridley turtle *Lepidochelys olivacea* (VU). Green *Chelonia mydas* (EN), leatherback *Dermochelys coriacea* (CR) and hawksbill turtles *Eretmochelys imbricata* (CR) also use the beaches to nest. The Area is estimated to possess, 20,000 species of Coleoptera (beetles), 13,000 species of ants, bees, wasps and their relatives in the Hymenoptera, 12,000 species of nematodes and 8,000 species of butterflies and moths (UNEP-WCMC, n.d.).

#### **CONSERVATION VALUE**

The site contains one of the largest and best preserved examples of the most severely threatened of neotropical forest types. The 105 km-long transect from cloud forest to coast has sufficient habitats, elevational and climatic diversity to support at least 60% of the species of Costa Rica, including corals both now and in a warmer future. The Area lies within a Conservation International-designated Conservation Hotspot, a WWF Global 200 Eco-region and encloses two small Ramsar wetland sites.

#### **CULTURAL HERITAGE**

The Chorotegas were the leading PreColumbian Indian tribe in Honduras, Nicaragua and Costa Rica with a well developed culture related to the Mayan. The historic 1,000 ha Hacienda Santa Rosa, established in 1580, was first used to breed transport mules, then became a cattle ranch. In 1856 it was the site of the 'battle' of Santa Rosa during Costa Rica's successful repulse of a piratical invasion and the house or *Casona*, was declared a national monument in 1966, though it burned down in 2001.

#### LOCAL HUMAN POPULATION

Some Indians still exist as farmers in the region which is the poorest in the country, the local cattle ranching industry having collapsed. Artisanal fishing exists but is not easy from the wind-and current-buffeted rocky shores, nor is coastal farming, which has preserved the ecology of the coast. Many settlers were removed on designation of the protected areas. 50,000 people now live in ten neighbouring villages and towns.

#### VISITORS AND VISITOR FACILITIES

Around 63,000 tourists visited the region in 1997, 60% of them Costa Ricans. Visitors to individual protected areas are charged an entrance fee of US\$6 for foreign tourists and US\$2 for nationals. The Area's headquarters is at Santa Rosa which is 35 km north-northwest of the city of Liberia off the Interamerican Highway which bisects the site. The Santa Rosa sector is one of the most heavily visited natural areas in Costa Rica, with a concentration on the former historic *Casona*, where there is now a visitor centre and exhibition. Nearby there are hot springs, the Naranjo beach which has excellent surfing and swimming and Nancite beach with its spectacular *arribadas* of olive ridley turtle. Networks of trails around the volcanoes start from the three mountain biological stations. Students and researchers are well provided for. The Santa Rosa sector has some visitor facilities, but most are located in nearby settlements and the city of Liberia which also has an airport.

## SCIENTIFIC RESEARCH AND FACILITIES

Santa Rosa and Corcovado National Parks are the two protected areas in Costa Rica most used by national and international researchers. Studies have been made by the Conservation Area's Research program among others of forest ecology, the local fauna, savanna succession, the effects of fire and the behaviour and ecology of vertebrate fauna, notably the olive ridley turtle. The inventory of vertebrates, insects and aquatic biota in the area has been ongoing since 1973 although the biota of the serpentine barrens is yet to be thoroughly studied. More than two million labelled insects from the area are deposited in the collections of the National Institute of Biodiversity.

In addition to the Santa Rosa headquarters there are five user-friendly biological stations, at Maritza, Cacao and Petilla on Volcán Orosi and at Nancite on the southern Santa Elena coast near Santa Rosa. The Horizontes Experimental Forest Station focuses on reforestation of the many abandoned cattle ranches. There is also a Marine Biological Station on Isla San José in the Murcielagos. Maritza has accommodation for 32, food service, electricity, an aquatic laboratory and conference room; Cacao can accommodate 32 and has a kitchen and laboratory; Petilla can accommodate 20, with a kitchen and conference room. The Center for Investigation of the Tropical Dry Forest at Santa Rosa has accommodation for 76. There is a computer centre for conferences, a documentation centre with basic and specialized biological information, food service, and tour guides. The nomination includes a partial list of published material to 1999 about the Area's ecosystems, habitats, organisms and processes, and lists some 500 relevant references. New publications about the area's biodiversity accumulate by some 100 a year.

## **MANAGEMENT**

In 1994 the Conservation Area became part of the National System of Conservation Areas by Executive Decree 22909. The Area is managed by a Technical Committee, a Local Committee, a now Regional Council and the National System of Conservation Areas (SINAC) of the Ministry of Environment & Energy (MINAE) set up in 1998 under Biodiversity Law 7788. Its overall aim is to maintain in perpetuity the biodiversity and related ecosystems of the region by the promotion and implementation of non-damaging development practices under the strict control and surveillance of its staff. To achieve this, the management has set the following objectives: inclusion of the few remaining marginal wild lands; development of environmental services to be offered locally, nationally and internationally; continuing study to understand the biology, location and functions of the local diversity of species and ecosystems; and the implementation of outreach programs.

The Area's management plan is an exhaustive document, which is reviewed and updated each year by the management programs accompanying the annual budget statement of each. Activities are developed by each program as needed. The management plan and budget are generated and approved first by the Area's management, followed by discussion and approval by the Regional Council, and by SINAC / MINAE. Hunting, logging and fire-setting are illegal. Traditionally, cattle grazing and fires set to provide grassland regulated the growth of dry forest understorey. This effect must now be replicated to preserve the ecologically valuable forest from destructive fires. The main means of achieving this is by an around-the- clock fire watch program staffed by motivated bioliterate local people. One of the Conservation Area's objectives has been to improve the local economy and the understanding of conservation through collaboration with the local people. It provides them with services such as a clean water supply and seedlings for regeneration of the dry forest which is now happening over 70.000 ha of old fields and pastures. Relations with the people, who also participate in the management committee, are therefore good, and outreach to thousands of the area's older children educates at least 2.000 students a year (UNEP-WCMC, n.d.).

#### MANAGEMENT CONSTRAINTS

The Conservation Area has been subjected to some four centuries of sporadic and irregular damage especially from anthropogenic fires but also from logging, hunting, clearing, and more recently rechannelling water for irrigation, sulphur mining, road construction, selective fence-post collection, pesticides, and the introduction of African grasses. But because of the area's poor soils, erratic climatic, relative isolation from the national centres of power and foreign ownership, the natural ecosystems were not too damaged to restore. The current threats are local climate change, pesticides from adjacent farms, recreational pressures, insufficient budgets, obstructive government regulations, public lack of interest and attempts to divert the endowment. And conflicts between outside fishing interests, sport fishing and local fishermen are growing. The exceptionally biodiverse marine portion is just now beginning intensive restoration and attempts to eliminate the severe hunting and overfishing by local, tourist and commercial industries (UNEP-WCMC, n.d.). Outsiders, mainly shrimpers from Puntarenas down the coast, use small-mesh nets which capture a vast array of species that are simply dumped. Traditional harvests of snapper and crab by local fisherman have shown a decrease in the size of animals and an increase in the effort required per catch. The Conservation Area has established good relations with local fishermen and started a program of applied research and participation. However, the social-economic-ecological problems are complex, with no easily prescribed solutions.

#### **STAFF**

The Area is a composite of national parks, forest reserves, wildlife refuges and recently purchased private properties melded into one administrative unit, which employs 97 people headed by a Director, in 20 administrative stations. 80% of the staff are locals, trained to become conservationists.

#### **BUDGET**

The total budget allocated in 1998 was US\$1.7 million. This funding is based on the income from an endowment fund of US\$12 million, legally held and invested by FPN with the Conservation Area and others. It was established in 1987-1989 through a debt-for-nature swap by the Swedish Government, the Costa Rican Central Bank, FPN and the Ministry of the Environment and Energy and allows the management to plan ahead. Financial assistance from the government is largely restricted to specific projects. Income comes also from the provision of environmental services and entrance fees.

## **LOCAL ADDRESS**

Area de Conservación Guanacaste, Apartado Postal 169-5000, Liberia, Guanacaste, Costa Rica.

Website: <a href="http://www.acguanacaste.ac.cr/">http://www.acguanacaste.ac.cr/</a>

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#### DATE

April 1999, 10-1999, 5-2004, 6-2009, 5-2011, January 2012.