

ECOREGIONAL ASSESSMENT EQUATORIAL PACIFIC

The Nature Conservancy, Fundación Agua, EcoCiencia, Fundación Jatun Sacha, CDC – Ecuador, CDC – UNALM 2004. Portafolio de Sitios Prioritarios para la Conservación dentro de la Unidad de Planificación Ecorregional Pacífico Ecuatorial. Quito – Ecuador.

EXECUTIVE SUMMARY

The main objective of the study is to identify priority conservation sites for the best management and conservation of the Equatorial Pacific natural resources. This portfolio of sites represents the main biological and ecological diversity of terrestrial, freshwater and marine ecosystems of the region.

The scientific results obtained on this process show a group of sites and priority actions to be developed by decision makers and stake holders both at national and bi-national level in Ecuador and Peru. The present study provides therefore the first fundamental step to concrete the implementation of activities for the protection of natural resources in the region.

Solid viability studies propose to protect about 1'500.000 hectares (11%) of the coastal border on Ecuador and northern Peru. Sixty-six watersheds were identified for protection, in which among other species, more than 68 fresh water fish species are endangered in the region. Also at least 18 marine-coastal areas are proposed for protection, that is about 500.000 hectares (15% of the marine-coastal studied area), in order to maintain unique species as far as their commercial, cultural and biological importance.

These results were attained thanks to the technical and scientific capacity of partner institutions of The Nature Conservancy in Ecuador and Peru, as: the Peru Conservation Data Center (CDC), The Ecuador Conservation Data Center (CDC) / Jatun Sacha Alliance, AGUA Foundation, SIMBIOE-Nazca and EcoCiencia. These institutions worked in cooperation with Governmental Organizations responsible for the terrestrial, freshwater and marine resources. Also, the principal museums, herbariums, universities and NGOs dedicated to these topics provided support to the project.

The Ecoregional Evaluation Methodology, developed by The Nature Conservancy (TNC), was used as the tool to obtain the portfolio. The main purpose of the portfolio is to maintain these unique sites' functionality for the benefit of future generations. This methodology

is part of a TNC conceptual vision called Design of a Geography of Hope for the planet's biological conservation.

The Equatorial Pacific (central-southern coast of Ecuador and northern Peru) is one of the world's most important regions from ecological and biological points of view. It contains several terrestrial ecoregions, a marine ecoregion, estuarine ecosystems, mangroves and several highly important watersheds. Despite of their ecological and biological richness these ecoregions are threatened and can disappear in a near future. Threats include deforestation for agricultural expansion, freshwater and sea pollution, overexploitation of natural resources, and several more. Action needs to be taken urgently.

The region includes 3 terrestrial ecoregions along the Pacific Coast, from the Choco tropical humid forests in northern Ecuador, to the Sechura desert in northern Peru. These ecoregions are: Ecuadorian Dry Forest, Guayaquil Flooded Grasslands (both endemic to coastal Ecuador) and the Tumbes-Piura Dry Forest in northern Peru and southern Ecuador. Several mangrove patches are included in estuarine ecosystems. The 3 ecoregions cover approximately 13 million hectares.

These ecoregions are not all similar, which provides high ecological richness to the whole region. There are humid areas surrounded by dry areas and a mosaic of different ecological systems. Endemism and biological richness is by this way increased. As an example, the mist humid forests located on top of the Chongón-Colonche coastal range, Ecuador, capture humidity that condense in altitude (over 450 m. high) and provides water to streams and rivers to the surrounding dry areas, where unique species are located and where human activities are developed, such as agriculture and cattle ranching.

Unfortunately the Equatorial Pacific terrestrial ecoregions present an advanced process of ecological and biological degradation, especially in the Ecuadorian side of the ecoregion, which is not as dry as the Peruvian side. These ecoregions are unique to South America and if the degradation tendency continues, extinction processes can be faced, starting by the endemic species. These species are not able to seek refuge in other ecoregions surrounding the Equatorial Pacific, such as the Choco humid forest (north), the Andes (east) and the Sechura desert in the south.

Degradation and deforestation rates are similar to the ones of Madagascar ecosystems and several dry and semi-humid systems in central Brazil. These areas, besides of Coastal Ecuador, are identified as one of the highest conservation priorities worldwide. Another fact

is that unlike humid ecological systems, dry ecosystems take much longer to recuperate after deforestation.

Within the Equatorial Pacific exists a complex network of watersheds and other freshwater systems, presenting different sizes and water volumes. The predominant watershed is the one of the Guayas river, one of the biggest watersheds of the continent's Pacific coast, similar to some North American watersheds, such as the Columbia river one in North-East USA. Specialists think that the Guayas watershed can feed some 15 million people, more than the current Ecuador's population.

These ecological and economical attributes should be enough to promote an extensive conservation campaign, but in the contrary these water systems are facing several and strong human pressures, including water pollution, dams and water capture for agriculture and towns, silting as a deforestation consequence, over-fishing and fishing with illegal techniques.

The Equatorial Pacific marine aspect is also highly important. The "up-welling" phenomena generated by the Humboldt's current brings millions of tons of nutrients from the sea bottom to the surface, making the Guayaquil marine ecoregion one of the richest in the world, similar to other marine areas were this phenomena occurs.

Given the dimensions of this marine ecoregion, with more than 3'200,000 hectares of open water and 1,000 Km. along the coast (from the equator to the 6 south parallel), and the challenges of underwater scientific research, this ecoregions keeps several secrets waiting to be revealed. Until now, the project's scientific team discovered new biological records, such as several species that were considered unique to the Galapagos islands or others to Central America.

Like the terrestrial and freshwater ecoregions, the Guayaquil marine ecoregions undergoes enormous pressures by human activities, such as over-fishing, including fishing of protected species (sharks and others), water pollution from industry (oil refineries, ports, agriculture, shrimp industry and others), massive tourism, among other threats. These activities go against the same industries that depend on the sea, specially the fishing for the human feeding.

With the main purpose of providing the necessary elements for the conservation of Equatorial Pacific, The Nature Conservancy and local partners developed this study, with the participation of national organizations, community-based organizations, and different social, economic and scientific sectors from Ecuador and Peru.

The Ecoregional Evaluation Methodology was applied, including 4 main steps:

(1) Selection of conservation objects. These are species, group of interacting species or ecological systems presenting an outstanding importance for the ecoregion. Selection is based on the main threats, rarity, endemism and/or the human importance of the objects (useful species, flag-species, others). Geographical distribution of the objects is represented on maps, using Geographic Information Systems.

(2) Viability evaluation. This step evaluates the conservation object's capacity of maintain their populations or their ecological functionality over the time. The main species or ecosystems' threats are analyzed ("condition" criteria), as well as the population density and/or the area occupied by the conservation objects ("size" criteria). Also the "landscape context" of the conservation objects is evaluated, which is a criteria integrating several aspects, such as "connectivity" within populations and the "integrity" of the main surrounding ecological processes. Among other techniques, advanced Geographic Information Systems and mathematical applications are used for the viability evaluation.

(3) Definition of conservation goals. This part of the study defines what are the minimal proportions or size aspects of a population or ecological system in order to survive in the future. By this means are identified the minimal areas to be protected for a population or an ecosystem to be viable.

(4) Portfolio design. The main purpose of the portfolio of sites is to ensure that most or all viable conservation objects are properly represented within one or more sites of the network. This portfolio is scientifically supported by the previous steps and results, and is also represented in maps for an easy interpretation by conservation decision makers.

Within the frame of the methodology, the bi-national team analyzed different aspects related to the conservation biology sciences, such as ecology, botany, zoology, natural resources and sociology, limnology, geomorphology and soils, physical and chemical water characteristics, meteorology, and others.

Among other important results, the terrestrial team identified 8 high priority blocks for biodiversity conservation, adding an area of 1'497,556 hectares, representing 11 % of the area analyzed. Within these blocks, 39 of the 40 Equatorial Pacific ecosystems are represented. These ecological systems were then analyzed in terms of their real conservation opportunities, their viability and functionality for the ecological future of the whole region.

For the freshwater component of the project, a portfolio of 66 priority hydrological systems were identified, including their surrounding areas; these areas cover from 3,000 to more than 100,000 hectares depending the size of the watersheds. Also, 68 freshwater and estuarine fish species were identified as conservation objects, due to their low populations (resulting from threats over freshwater systems) and to their biological importance, including endemic species and the ones of commercial and nutritional value.

Within the marine component of the analysis, 18 coastal and marine high priority block sites were selected at the Guayaquil marine ecoregion; these blocks add an area of more than 500,000 hectares. This selection represents up to 63 % of the total expected portfolio and covers close to 15 % of the whole ecoregion.

These marine block sites are proportionately distributed among 3 main ecoregional zones: the Tropical zone (north), the Central zone (or intermediate band) and the Subtropical zone in the south. The selected 18 sites represent most of the inter-tidal and sub-tidal priority areas. Also, 6 of the 8 priority biological communities are represented, as well as the majority of the species identified as important conservation objects.

Results and recommendations of this 2 year project are entirely available to decision makers and social authorities for a proper natural resources management in the region. Are also available for planners, local communities, industry (fisheries, shrimp production, agriculture, others), as well as for Government Organizations, NGOs, students and other people interested in the future of these two nations.

We firmly hope that the results coming from this scientific accomplishment carried out by Ecuadorian and Peruvian specialists will be jointly applied by the authorities as the best way to support the social and economic development of these two nations, and protect our natural resources, such as water, soil, vegetation, marine resources and biodiversity in general.