

High Andean **Wetlands**

fragile, strategic ecosystems for millions of people





Junín lake / Perú

**Many species
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General characteristics and importance of high andean wetlands

The lakes, lagoons, marshes and peat bogs of the High Andes and the mountains of Costa Rica are ecosystems of enormous strategic importance for more than 100 million people. Their ecological, economic, social and cultural value must be taken into account in the design and implementation of development policies in countries where these ecosystems are found.

The majority of paramo wetlands, jalca and puna are not isolated bodies of water, but rather, ecosystem complexes. Therefore, they play an essential role in the dynamics of highland tributary basins, as well as of other hydrographic systems, given that their waters flow towards the Amazonian watersheds or towards the Pacific or Caribbean coasts.

As well as being important sources of water, high Andean wetlands have a singular biological diversity. Many species of plants and animals inhabiting these ecosystems are not found in any other parts of the world. Furthermore, several species of

migratory birds congregate in these areas on a temporary basis. Some of these wetlands provide shelter and reproduction sites for a large number of threatened animals, such as Andean flamingos and harlequin frogs of the genus *Atelopus*. Additionally, they are a fundamental component of the habitat of some economic and ecologically important mammals, such as the vicuña, guanaco and chinchilla.

The Ramsar Convention considers high Andean wetlands to be highly fragile ecosystems as a result of both natural causes (such as climate change or prolonged drought on the puna) as well as human intervention (for example, non-sustainable agriculture, excessive grazing and open cast mining). Many mountain wetlands are being lost at an accelerated rate, above all, due to poor management and a lack of knowledge of their economic and ecological importance.

Ecosystem services from high andean wetlands

One of the main services provided by high Andean wetlands is the provision of water, not only for human communities living in the surrounding areas, but also for irrigating agricultural land, generating hydroelectric energy and for drinking water further downstream.

As well as providing water, wetlands provide vegetable fibres, food and genetic resources, in addition to regulating and feeding hydrographic systems and fixing carbon. These ecosystems also represent an invaluable cultural heritage due to their spiritual and religious significance. High Andean wetlands are important areas for life and cultural wealth in general, rich in symbolism, myths and spiritual values for numerous indigenous and rural



Lago Uru Uru / Bolivia

Some of these wetlands provide shelter and reproduction sites for a large number of threatened animals



Laguna Colorada / Bolivia

Services provided by high Andean wetlands are not unlimited. The degradation of these ecosystems gives rise to the loss of not only essential water resources, but also many other benefits

communities. These historic and traditional values, many of which are directly linked to wetlands make up part of the Andean cultural heritage and should be taken into account in the management of these natural areas.

However, it must be highlighted that services provided by high Andean wetlands are not unlimited. The degradation of these ecosystems gives rise to the loss of not only essential water resources, but also many other benefits provided by such an environment, including their potential for recreation and ecotourism. Therefore, if we want to continue to exploit these ecosystems we must conserve them. Their use must not exceed a critical threshold, beyond which their deterioration becomes irreversible.



Afombrales wetlands, Los Nevados National Natural Park / Colombia

Dominant
vegetation in
mountain
wetlands is
highly variable

Diversity and origin of high andean wetlands

A great diversity of high Andean wetlands exists, partially due to their different origins. On the paramos, puna and jalca, there are freshwater lakes of glacial, volcanic and tectonic origin; salt pans, saline and brackish lagoons in areas which were formerly occupied by sea water; peat bogs and bofedales formed by supersaturation of soils or by groundwater; as well as hot springs and geysers of volcanic origin, among others. Similarly, dominant vegetation in mountain wetlands is highly variable, with the presence of the following formations, among others: different kinds of reed beds, dense herbaceous formations associated with salt soils known as *vegas*, dense cushions of plants of the genus *Distichia* and thick stands of mountain bamboo.

Los Nevados National Natural Park / Colombia





Bofedal Laguna del Indio / Perú

**Paramo, Jalca
and Puna are
the three
bioregions
which include
high andean
wetlands**

Bioregions including high andean wetlands

Paramo

Paramos constitute a high tropical mountain bioregion, covering the Northern Andes and the high Central American mountains. Paramos are found in the north of Peru, Ecuador, Colombia, Venezuela and Costa Rica. They are characterised by low temperatures, pronounced climatic variation during the day and a relative humidity of more than 80%. Their soils are usually rich in organic matter and have a high capacity for water storage. Paramo vegetation consists of grasslands or scrublands including roseate plants, shrubs, bamboos and moss cushions.

One of the most outstanding attributes of the paramos is their great diversity of freshwater sources, coming from glaciers in addition to the atmosphere. Water is found in the form of ponds, marshland, lakes and streams emerging from underground. Due

to paramo soils and vegetation retaining such enormous quantities of water, in practical terms, the majority of these wetlands could be classed as extensive semi-aquatic ecosystems.

Jalca

Jalca is a transition bioregion between paramo and puna, found in the mountains of northern Peru. They are very similar in structure and function to paramos, given that they have a high relative humidity and rainfall, as well as marked daily climatic fluctuations. As oppose to paramos, a marked seasonal climatic fluctuation also exists in jalca ecosystems.

Puna

The puna bioregion is found on the high plateaus of the Peruvian, Bolivian, Argentinean and Chilean Andes. The ecosystem is characterised by an intense cold, aridity and marked daily fluctuations in temperature. Due to its latitude it is also subject to drastic seasonal climatic changes. Puna vegetation is made up of small grasslands and disperse dwarf shrubs and trees. Many of the rivers flowing towards the puna often have patches of vegetation in their lower reaches which are characteristic of other altitudes, forming a type of oasis in a predominantly desert-like landscape.

Human population density in puna is much higher than in paramo, some big cities, such as La Paz (Bolivia) or Cusco (Peru) are built over the puna.



Los Puentes / Venezuela



Tara salt lake / Chile

The Ramsar convention approved a resolution to recognise “High Andean wetlands as strategic ecosystems”

The Ramsar convention and high andean wetlands

The convention on wetlands of international importance was signed in Ramsar, Iran in 1971. The 8th Conference of the Contracting Parties to the Ramsar Convention, held in Valencia, Spain in November 2002, approved a resolution to recognise “High Andean wetlands as strategic ecosystems”. By means of this resolution, the countries parties to the convention committed themselves to establishing “specific work programmes for High Andean wetlands and the basins fed by them, in order to preserve their valuable biodiversity, their function as regulators of water, and as living space of many local and peasant communities and indigenous peoples”.

With the idea of putting this resolution into practice, the Ramsar Secretariat, associated countries and organisations (Wetlands International, Birdlife International, WWF and IUCN) as well as technical networks (High Andes Flamingo Conservation Group and International Working Group on Paramos) took on the task

of designing, promoting and implementing a joint strategy for the conservation and sustainable use of high Andean wetlands. It is hoped that within the framework of this strategy, the number of high Andean wetlands designated as sites of international importance increases (see table 1). This is one of the tools employed by the convention to promote conservation and sustainable use of those wetlands which meet special criteria.



Vicuña (*Vicugna vicugna*)
in Surire salt lake / Chile

High andean Ramsar sites

Country	High Andean Ramsar Sites	Altitude (m)	Area (ha)
Argentina	Laguna de los Pozuelos	3500	16,224
	Lagunas de Vilama	4500	157,000
	Laguna Brava Provincial Reserve	2500-4500	405,000
Bolivia	Laguna Colorada	4232	51,318
	Titicaca Lake (Bolivian sector)	3809-4200	800,000
	Tajzara Watershed	3700-4100	5500
	Lagos Poopó and Uru Uru	3686	967,607
Chile	Surire salt lake	4200	15,858
	Huasco salt lake	3500	6000
	Tara salt lake	4400	5443
	Soncor Hidrologic system	2300	5016
	Laguna del Negro Francisco and Laguna Sta. Rosa	3715-4000	62,460
Colombia	La Cocha Lake	2700-3500	39,000
Ecuador	El Cajas National Park Wetland System	3160-4445	29,477
Perú	Titicaca Lake (Peruvian sector)	3810	460,000
	Junín Lake	4080-4125	53,000
	Laguna del Indio and Dique de los Españoles	4440	502
	Laguna de Salinas and adjacent peatbogs	4300	17,657
In the northern limits of the paramo ecosystem			
Costa Rica	Salamanca peatbogs	2600-3290	192,520

Table 1. List of Ramsar sites until July 2005



Ruta Cara del Indio / Venezuela



Paramo / Venezuela

High andean wetlands strategy

The alliance of eight countries, contracting parties to the Ramsar convention, established an active process to design the “Regional Strategy for the Conservation and Sustainable Use of High Andean Wetlands”. This is a joint initiative resulting from the convention’s key points, instigated by a group of supporting organisations making up the so-called Contact Group. This group was set up during the Pan-American Ramsar meeting in Guayaquil in July 2002 (see table 2).

Contact group on high andean wetlands

Countries	Ramsar Secretariat	Associated Organisations	Technical network
Argentina Bolivia Colombia Chile Ecuador Perú Venezuela Costa Rica	Senior Advisor for the Americas Ramsar Regional Center (CREHO)	<i>Wetlands</i> Internacional <i>Birdlife</i> Internacional WWF UICN	International Working Group on Paramos High Andes Flamingo Conservation Group

Table 2: Contact Group

The Contact Group defined the core issues as well as the basic content of the strategy. The group also created participative opportunities for consultation in each country. The strategy has been enhanced and validated thanks to these efforts, involving contributions from numerous governmental and non-government actors.

The strategy's **General Objective** is to promote conservation and sustainable use of high Andean wetlands by means of a long-term regional management process among participating countries with the aim of maintaining goods and services provided by the wetlands, in addition to reducing existing impacts and threats.

The **Specific Objectives** are:

1. To establish a joint vision of high Andean wetlands by means of coordination mechanisms and regional capacity building.
2. To complete and improve scientific and technical knowledge of high Andean wetlands and other functionally



Salt extraction / Perú



Laguna Miscanti / Chile



Las González river / Venezuela

associated ecosystems in order to support their conservation and sustainable use.

3. To promote conservation, management and sustainable use of natural and cultural resources of high Andean wetlands and associated goods and services.
4. To strengthen education and communication processes to achieve heightened public awareness of the importance and value of high Andean wetlands.
5. To coordinate wetland conservation policies among countries of the region.
6. To design and implement a monitoring and evaluation system for the wetland strategy in order to guarantee its sustainability in the medium and long term.

The strategy's guiding principles

- Ecosystem approach
- Sustainability

- Participation
- Respect and recognition for cultural diversity
- Integral vision
- Precautionary principle

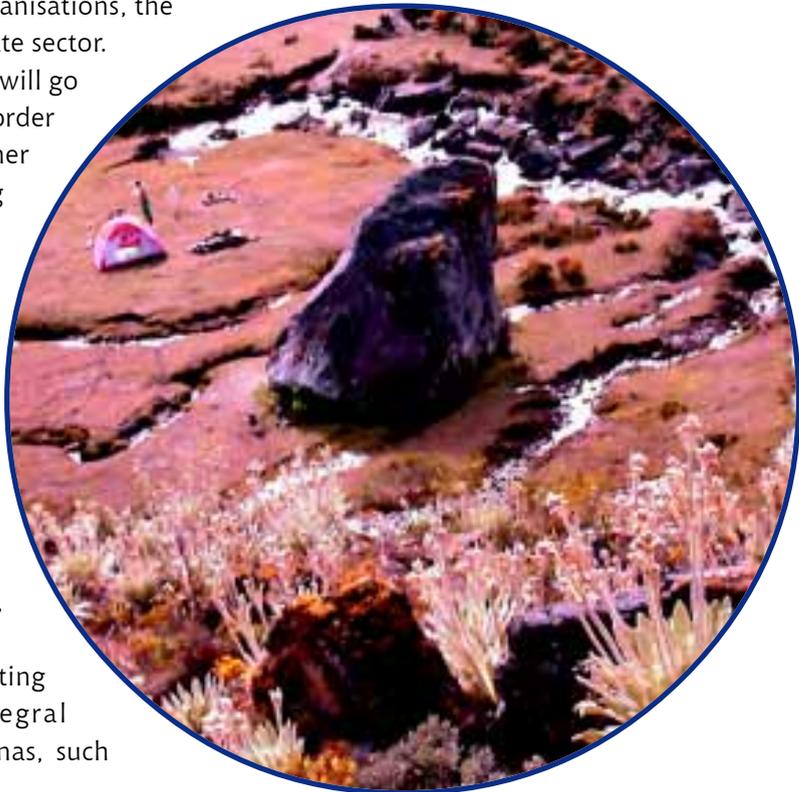
The high Andean wetlands strategy, more than a document, is a process which catalyses actions and promotes participation. It foments social and political appropriation and cooperation between all stakeholders. In fact, it is hoped that an increasing number of national and international government organisations in addition to NGOs will join the initiative.

The strategy is a meeting point for different actors, agendas and interests, stimulating dialogue and cooperation among authorities, indigenous organisations, the scientific community and the private sector. It is hoped, then, that the strategy will go beyond the Ramsar Convention in order for links to be forged between other international agreements, including the Convention on Biological Diversity, the Convention to Combat Desertification, and the Climate Change Convention, among others. At regional scale, it is also hoped that the strategy will be assimilated by different opportunities for cooperation and integration, and at national scale, that it will be coordinated with country-wide development plans, influencing local actions.

The strategy is based on existing initiatives related to the integral management of paramos and punas, such

**The strategy is
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Cleaning journey in the paramo / Venezuela



The strategy is accompanied by an Action Plan a Financial Strategy and a Project Portfolio

as the consolidation of protected areas - including high Andean wetlands; specific programmes for the conservation of threatened species, such as Andean Flamingos; development of participative management initiatives; development of emblematic ecotourism projects such as in Salar de Uyuni in Bolivia, among many others. The strategy attempts to promote the coordination of existing initiatives, coordinate agendas which directly or indirectly affect high Andean wetlands, encourage alliances, carry out necessary capacity building and proactively generate new actions which detain the degradation of fundamental ecosystem services.

The strategy is accompanied by an Action Plan (containing expected results and activities), a Financial Strategy and a Project Portfolio. This clearly indicates the intention of making this strategy a practical instrument for the sustainable and socially-just management of these strategic ecosystems.

Turberas in Los Nevados National Natural Park / Colombia





Laguna Albarregas / Venezuela

A living strategy for high andean wetlands and human development

The Regional Strategy for the Conservation and Sustainable Use of High Andean Wetlands is:

- **An expanding process.** Since the initial idea at the Pan-American Ramsar meeting (Ecuador 2002), the strategy has increased its scope and recognition both inside and outside the ambit of the Wetlands Convention.
- **A collective design process.** The setting up of an alliance between different governments and civil society organisations, united by a shared interest in working for high Andean wetlands and combining complementary skills, has been a fundamental part of this dynamic process.
- **An action-planning process.** The strategy's action plan is already up and running, the project portfolio includes the development of specific products by the Contact Group as well as links to existing projects and initiatives being carried out by governments and associated organisations.



Paramo / Venezuela



Salar Aguas Calientes / Chile



Otun lagoon, Los Nevados National
Natural Park / Colombia

- **Synergetic.** The strategy aims to cooperate with similar initiatives at local, regional and international level.
- **Integrated with development.** The strategy projects high Andean wetland management according to national and regional development objectives. It also integrates the ecosystem conservation with human development as well as economic growth and competitiveness.
- **Open and participative.** At national, regional and international level, interested persons and organisations are invited to contribute to the development of the strategy.



Frailejones in Los Patos lagoon / Venezuela

Project portfolio to raise funds and mobilise skills for the strategy's implementation

To implement the strategy, a “core” project portfolio was established covering fundamental aspects of the Action Plan. This portfolio includes the following projects:

- 1. Baseline environmental, social and economic studies of high Andean wetlands in the north and south of the region.**

Objective: Consolidate, update, value and systematise biophysical and socioeconomic information on high Andean wetlands for use in the development of planning and management processes.

- 2. Identification of high Andean wetland areas as potential Ramsar sites or other conservation categories and management plan development.**



Los Patos lagoon / Venezuela



Arrebiatadas lagoon, National Sanctuary
Tabaconas - Namballe / Perú



Laguna de Salinas / Perú

Objective: Promote the conservation, management and sustainable use of strategic wetland areas in the region through the definition of conservation status.

3. Establishment of a monitoring system for the environment and development activities (tourism, mining, infrastructure, traditional uses, etc.) in high Andean wetlands.

Objective: Develop a monitoring and evaluation mechanism for high Andean wetlands which allows uniform monitoring to be carried out on environmental, social and economic variables providing continuous support for the adaptive management of these ecosystems.

4. Guaranteeing water, guaranteeing the future: Communicating the Regional Strategy for the Conservation and Sustainable Use of High Andean Wetlands (Phase 1).

Objective: Effectively communicate the Regional Strategy for the Conservation and Sustainable Use of High Andean Wetlands to key authorities in order to contribute to the generation of favourable conditions for its implementation.

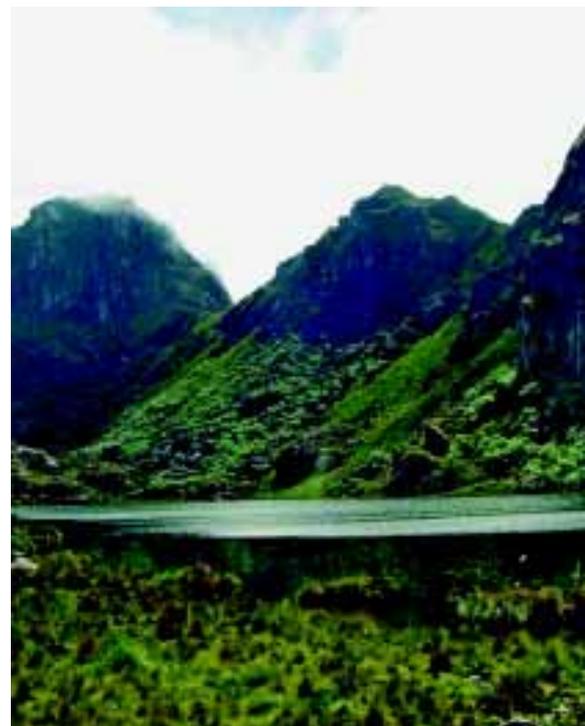
Furthermore, the following subregional projects are being carried out:

- Strategy for the conservation and designation of priority high Andean wetlands in the Northern Andes Ecoregional Complex (coordinated by WWF Colombia).
- High Andean wetlands network based on shared species (coordinated by the High Andes Flamingo Conservation Group).

Other projects are also planned to meet the following action priorities, including:

- Strengthening of the high Andean wetland strategy's coordination mechanism.
- Support for consolidating national action plans linked to the regional strategy for high Andean wetlands.
- Coordination of political and legislative instruments for the sustainable management of high Andean wetlands.
- Adapting tools in order to apply the ecosystem approach to the management of high Andean wetlands.
- Capacity building project for biodiversity conservation in high Andean wetlands.
- Development of integrated water management instruments in high Andean wetlands.
- Recuperation of socio-cultural values in high Andean wetlands.
- Ecosystem services management in high Andean wetlands from a perspective of social equality and poverty alleviation.
- Training for social and environmental monitoring of high Andean wetlands.
- Valuation of ecosystem goods and services provided by high Andean wetlands.

Organisations interested in providing funding and/or institutional skills to develop the strategy's portfolio are welcomed.



Los Puentes / Venezuela

**Organisations
interested in
providing
funding and/or
institutional
skills to develop
the strategy's
portfolio are
welcomed**

ARGENTINA

- **BirdLife International.** -EUGENIO COCONIER (coconier@avesargentinas@org.ar)
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- **Sección de Ambiente y Desarrollo Sustentable.** -ÓSCAR PADIN (opadin@medioambiente.gov.ar)
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BOLIVIA

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VENEZUELA

- **MARN.** -FEDERICO BARROSO (fbarroso@mam.gov.ve)

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