

# Ecosystem Services in High Andean Wetlands

## Title

Ecosystem services provided by high Andean wetlands must be understood in order to ensure their conservation. Therefore, as part of the [High Andean Wetlands Initiative](#), BirdLife International and its partners, have implemented participative exercises to prioritise those ecosystem services which would be most affected by an alteration in the conservation status of Important Bird Areas (IBAs) and Ramsar Sites within the initiative. Subsequent field visits are performed to assess the prioritised ecosystem services, using a [toolkit](#) developed by BirdLife International, Anglia Ruskin University, Cambridge University, the Royal Society for the Protection of Birds and the UNEP World Conservation Monitoring Centre, with input and guidance from more than 50 scientists. The assessment of ecosystem services with this toolkit is the first of its kind in high Andean wetlands and the continental Americas.

## *The “toolkit”*

The toolkit is used to measure ecosystem services and associated changes given an altered conservation status of a site. It is designed to work at the site scale, and is rapid, cost-effective and participative, generating local capacity and producing robust results in agreement with local reality. The toolkit helps users with limited capacity (e.g. technical knowledge, time) and resources (e.g. money, personnel) to measure and monitor ecosystem services as well as identify who would gain and who would lose as a result of any change in land use and the subsequent changes in the provision of services.

First, the toolkit prioritises the most important services at a site from the perspective of human, economic and cultural wellbeing, among others, and from the perspective of changes in the availability of those services under a future scenario with specific management schemes. This priority setting is implemented with the participation of stakeholders, including those who make use of the ecosystem services, the authorities who protect the resources, scientists and local experts, among others. After the priority ecosystem services have been established, field measurements of their current state are made, complemented by interviews with the service beneficiaries, and by secondary information.

## *Assessment of ecosystem services in high Andean wetlands: Pilot initiative in Llanganates National Park*

Image not found

Assessment of ecosystem services in Llanganates National Park. © Aves y Conservación

Priority setting exercises have already taken place at five pilot sites within BirdLife International's High Andean Wetlands Initiative ([Argentina: Buenos Aires Plateau](#), High Andean and Puna Lagoons of Catamarca, [Bolivia: Lake Poopó and Lake Uru Uru](#), [Ecuador: Llanganates National Park](#), and [Peru: Lake Junín](#)). To date, field based measurements have only been implemented in Llanganates National Park. However, based on this pilot experience, field measurements of ecosystem services will be implemented at all the remaining sites during a subsequent stage of the project.

The priority ecosystem services at Llanganates were chosen on the basis of which services would be most affected by development activities and other types of threats, and those which have the greatest direct effect on the economy and wellbeing of the local communities depending on the park.

In Llanganates, the following services were prioritised and measured in the field:

- Water for irrigation and human consumption
- Water for hydroelectricity generation
- Tourism
- Ecosystem goods (paramo grasslands as fodder for livestock)
- Carbon storage (regulation of global climate)

If current management practices in Llanganates continue, there would be no significant reduction in water for irrigation and human consumption, due to a minimal projected reduction in forest cover as a result of its inaccessibility. This slight reduction would not have a sizeable impact on the hydroelectric energy production either. However, tourism would suffer significant losses under the current management scheme, given that many visitors would stop going to the park due to the degradation of its ecosystems, especially the high Andean moorland, or 'paramo'. If current conditions continue, the area of paramo in Llanganates used as livestock pasture would increase, as well as planted pastureland, with an associated increase in livestock. With this increase, disturbance of the paramo would triplicate, leading to an approximate 4% reduction in stored carbon, which would increase to a 14% reduction if the effect of the erosion caused by the livestock is included.

#### *Priority setting of ecosystem services in Argentina, Bolivia and Peru*

Priority ecosystem services were chosen at the remaining sites, with positive experiences registered at all. Given the future scenario of a protected area at the [Buenos Aires Plateau](#), in Argentinean Patagonia, six services were prioritised, of which, the only one to decline would be the production of sheep's wool given that livestock would no longer be permitted within the protected area. On the other hand, services such as water, erosion control, cultural value, genetic reservoir, tourism and recreation would increase due to a greater level of protection of the site.

Given the size of the area of the High Andean and Puna Lagoons of Catamarca, the priority setting exercise was limited to the sites of El Peñón and Laguna Grande. Under a scenario of current levels of exploitation, all priority services (fibres, energy, water courses, water quality) would suffer large decreases with the exception of tourism, which would increase, in line with current observations.

Under current usage and extraction regimes at [Lakes Poopó and Uru Uru](#) in Bolivia, areas with high levels of mining would further deteriorate; water sources and quality in agricultural areas would also suffer large decreases and the impact of climate change would be greater. However, tourist activities would increase, possibly as an economic alternative in response to decreases in the agricultural productivity of the soil.

At [Lake Junín](#) in Peru, six priority ecosystem services were chosen on the basis of those most susceptible to change in the next 10 years. Wild food sources (fish and birds), energy (hydroelectric), drinking water, recreation and tourism, scenic beauty and local climate regulation would all decrease in terms of availability.

Already, the results of the priority setting exercises are being used as decision-making tools and for planning conservation actions at the Ramsar sites and the future protected area of the [Buenos Aires Plateau](#). At later stages of the project, field measurements will be made at [Buenos Aires Plateau](#), the High Andean and Puna Lagoons of Catamarca, [Lake Poopó and Lake Uru Uru](#), and [Lake Junín](#).

- More information on BirdLife's work on ecosystem services:

<http://www.birdlife.org/datazone/sowb/spotecoservice> More information on the projects:

- Argentina: Buenos Aires Plateau

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<http://www.justgiving.com/Hooded-Grebe>  
<http://www.youtube.com/watch?v=8RfZH9x4CvI&feature=share>  
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