

Information Sheet on Ramsar Wetlands

1. Date this sheet was completed/updated: 10 August 2000

2. Country: Argentina

3. Name of wetland: Lagunas de Vilama

4. Geographical coordinates:

22° 36' South latitude
66° 55' West longitude

5. Altitude: 4500 metres above sea level

6. Area: 157,000 hectares

7. Overview: This Ramsar site includes more than ten high-Andean lakes that occupy the bottoms of endorheic depressions. The lakes have many different characteristics; ranging from saline to hyper saline, and from deep to shallow. They are the habitat for populations of a rich aquatic bird life, with a large number of endemic or threatened species, such as flamingos (*parinas*) (*Phoenicoparrus andinus*, *P. jamesi*) and the *gallareta* (*Fulica cornuta*). Many migratory Nearctic species use this area for feeding. In the *vegas* around the lakes, locally called *cienagas*, there are other vulnerable species such as the vicuña and *suri* (*ñandú petiso*) (*Pterocnemia pennata garleppi*). These areas are also used for grazing herds of domesticated South American mammals related to the camel and sheep of the local inhabitants who practise forms of traditional transhumance. Apart from these *vegas*, the most widespread plant formations are shrub steppe and high-Andean pasture.

8. Wetland type: Q, R, Sp, Ss

9. Ramsar criteria: 1a, 1c, 2a, 2b, 2c, 2d, 3b, 3c

The criteria that best characterize this site: 1a, 2a, 2b, 3c

10. Map of site included? Please tick yes -or- no

11. Name and address of the compiler of this form:

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12. Justification of the criteria selected under point 9, on previous page:

Criterion 1a: This wetland is a particularly good representative example of a natural or near-natural wetland, characteristic of the appropriate biogeographic region. The Lagunas de Vilama represent a well preserved example of several types of high-Andean saline wetlands (Caziani et al. 2000).

Criterion 1c: This wetland is a particularly good representative example of a wetland which plays a substantial hydrological, biological or ecological role in the natural functioning of a major river basin. Because this is an endorheic basin, any change in the streams carrying minerals and sediments directly affects the lakes, which are habitat for unique communities. These are feeding and nesting areas (Mascitti et al. 1997). For aquatic waterfowl, these lakes are complemented by other nearby bodies of water in Argentina, Bolivia and Chile, some of which are already Ramsar sites (Laguna de Pozuelos, Laguna Colorada).

Criterion 2a: This wetland supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant or animal, or an appreciable number of individuals of any one or more. Among observed species are the James's flamingo (*Phoenicoparrus jamesi*) and the *gallareta cornuda* (*Fulica cornuta*), which are vulnerable species (FUCEMA 1997). In 1997 and 1998, more than 8500 specimens of James's flamingo were recorded and in 1995 almost 9000 *gallaretas* (Caziani et al. 1999).

Criterion 2b: This wetland is of special value for maintaining the genetic and ecological diversity of a region because of the quality and peculiarities of its flora and fauna. There are 24 bird species that directly depend on the presence of water and another 23 have been recorded on the shores. In the streams draining these lakes, fish and amphibians have been observed fish (*Heterodontus*) and amphibians (*Bufo* and *Telmatobius*).

Several species of mammals live in the surrounding marshes and reptiles of the genus *Liolaemus* have been recorded (Caziani et al. 1999 and Gil 1995).

Criterion 2c: This wetland is of special value as the habitat of plants or animals at a critical state of their biological cycle. In these desert ecosystems, water is the key element for the creation of areas with greater biodiversity (Bonaventura et al. 1995). Because of this, these sites are of great importance for feeding, nesting and stopovers during migration.

Criterion 2d: This wetland is of special value for one or more endemic plant or animal species or communities. A large part of the species in these environments are endemic to the puna. The *gallareta cornuda* is very abundant. On the other hand, the Andean flamingo (*Phoenicoparrus andinus*), the *gallareta gigante* (*Fulica gigantea*) and the *Recurvirostra andina* are rare. The James's flamingo, which had been recorded only in the Andes for many years, has recently been observed farther south in the Province of Cordoba (Cobos et al. 1999). Among endemic mammals found here are the *gato andino* (*Oreailurus jacobita*) and the vicuña.

Criterion 3b: This wetland regularly supports substantial numbers of individuals from particular groups of waterfowl, indicative of wetland values, productivity or diversity. This wetland regularly supports 10,000 or more water birds, including the flamingo, which is an indicator of the level of invertebrates, algae and diatoms (Caziani et al. 2000).

Criterion 3c: This wetland regularly supports 1 per cent of the individuals in a population of one species or subspecies of waterfowl. This wetland regularly supports 13 per cent of the world population of James's flamingo and 9 per cent of that of the Andean flamingo (Valqui et al. 2000).

13. General location:

Lagunas de Vilama is located in extreme north-western Argentina near the border with Bolivia and Chile, in the department of Rinconada in Jujuy province. The nearest small town is Lagunilla de Farallón, and the nearest important city is Abrapampa 100 kilometres away with 8000 inhabitants.

14. Physical features:

Lagunas de Vilama is located at the base of the main axis of the Andes on the altiplano (puna). The landscape is volcanic with large areas in which lakes have formed in the depressions.

The climate is very cold and dry, with a large range of daily temperatures. Annual precipitation is less than 100 millimetres. The extreme temperatures are -32° and 22° C, and the annual average temperature is about 7° C. There is sparse plant cover with more than 50 per cent of bare soil.

15. Hydrological values:

The lakes are fed by ground water or snow melt. The small lakes are saline and deep. The two largest lakes, Vilama and Palar, are shallow and hyper saline. The climate influenced by hemispheric processes (El Niño current) produces large fluctuations in precipitation, with dry periods that affect the water level in the lakes, which, in turn, show a high seasonal variation in their physical and chemical characteristics. Vilama and Palar are characterized by a high concentration of salts. The chemical composition of the water in Aranal, Caití, Catal and Isla Grande is quite variable. Pululos, Cerro Negro and Colpayoc are the least saline (Caziani et al. 2000).

16. Ecological features:

In these high-altitude ecosystems, the presence or absence of water, the lake's orientation and the watershed create a complex mosaic of environments and micro-environments. These lakes and their distinct physical and biological characteristics are part of this pattern. The Lagunas de Vilama are in the phytogeographic province of the High Andes (Cabrera et al. 1973). Caziani and Derlindati (1999, 2000) classified the lakes as brackish/hyper saline, shallow/deep and large/small. Ducks, *gallaretas* and flamingos take advantage of these differences.

17. Noteworthy flora:

The community of high Andean pastures is dominated by *Festuca* spp. and the shrub steppes by *Parastrephia* sp. The marshes are abundant in *Oxychloe* sp. and the rocky areas with *yareta* of the genus *Azorella*.

18. Noteworthy fauna:

There are important endemic species: (a) very abundant localized endemics, *Fulica cornuta*; (b) localized endemics, *Phoenicoparrus andinus*; (c) endemics to the puna, *Anas puna*, *Charadrius alticola*, *Gallinago andina* and *Recurvirostra andina*; (d) endemics whose range extends into the higher parts of the southern Andes, *Chloephaga melanoptera*, *Larus serranus*; and (e) vulnerable species, *Phoenicoparrus jamesi* (FUCEMA 1998 and Fjeldsa 1985). Among the land species are the vicuña and the *suri*, also known as the *ñandú petiso*. The *Chinchilla brevicaudata* merits special mention because of strong interest in its relic population. It is quite possible that some of the relic populations live in enclaves in rocky areas in the Reserve Altoandina de la Chinchilla, where Lagunas de Vilama are found.

19. Social and cultural values:

The first settlements date from about 3000 B.C. and include an Indian group that had domesticated the potato, quinoa, oca and green potato and animals such as the llama. Between 700 and 500 B.C., they had become expert farmers and around 800 A.D. had developed techniques for ploughing, lyophilization and storage. Domination by the Incas and later the Spanish caused deep changes.

Important and very numerous archaeological sites provide evidence of intense

settlement, which in the highest parts of the puna were used from pre-Incan times primarily for hunting and grazing activities. The present human inhabitants, mostly indigenous and Quechua-speaking, are still numerous. Local inhabitants raise mixed herds of sheep and domesticated South American mammals. The lakes, marshes and springs are considered to be very important ritual sites, at which ceremonies are held in homage to the “mother soil” (*pachamama*).

20. Land tenure/ownership of:

At the site and in the surrounding areas, the land is owned by the province, with recognition of the traditional use for grazing by families occupying the land.

21. Current land use:

At the site. Not used except during dry periods when the water drops and newly dried land is used for grazing.

In the surrounding areas. Grazing

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

At the site. Overgrazing and the cutting of woody shrubs for domestic consumption could lead to the erosion of sediments toward the lakes carried by runoff.

In the surrounding areas. Although there is currently no intense mining activity in the surrounding area, any increase in activity should be strictly controlled.

23. Conservation measures taken:

All the lakes are within the Reserva Altoandina de la Chinchilla under the jurisdiction of the province in accordance with Decree No. 2213-E-92. There is also a conservation project for high Andean wetlands in Argentina, Bolivia and Chile with the support of national nature protection agencies (Administración de Parques Nacionales and Universidad Nacional de Salta in Argentina, Corporación Nacional Forestal in Chile and the Dirección Nacional de Biodiversidad in Bolivia). These ecosystems have been identified as priorities for conservation in the Argentine strategy for conservation of biodiversity prepared in 1998.

24. Conservation measures proposed but not yet implemented:

The Reserva Altoandina de la Chinchilla and the Reserva de la Biosfera Laguna de Pozuelos (a Ramsar site) are included in the project Altoandina Binacional Argentino-Boliviana Lagos del Cielo de América, supported by the province of Jujuy and the Argentine Secretaría de Desarrollo Sustentable y Política Ambiental.

25. Current scientific research and facilities:

Programme for Strengthening the Reserva Altoandina de la Chinchilla. Plan de Auditoría Ambiental del Gasoducto Norandino. Dirección de Recursos Naturales Renovables

Survey of sites with relic populations of *Chinchilla brevicaudata* on the Jujuy altiplano and identification of habitat indicators. Instituto de Biología de la Altura. Universidad Nacional de Jujuy

Project Reserva de la Biosfera Altiplánica Binacional Argentino-Boliviano “Lagos del Cielo de América”. Instituto de Biología de la Altura. Universidad Nacional de Jujuy

High-Andean Wetlands Programme, Argentina. Joint programme of the Universidad Nacional de Salta and the Administración de Parques Nacionales

Programmes for monitoring and following up of the Grupo para la Conservación de los Flamencos Altoandinos

26. Current conservation education:

The Dirección General de Recursos Naturales Renovables of Jujuy province has prepared an information brochure on the Reserva Altoandina de la Chinchilla with special mention of the Lagunas de Vilama.

The Instituto de Biología de la Altura of the Universidad Nacional de Jujuy has a refuge suitable for housing field researchers.

27. Current recreation and tourism:

Tourism is incipient because of the area’s isolation and difficult access, above all in summer.

28. Jurisdiction:

Province of Jujuy

29. Management authority:

Dirección General de Recursos Naturales Renovables

30. Bibliographical references: