

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 of the Conference of the Contracting Parties.
(Unofficial translation from Spanish by Iván Darío Valencia, February 4, 2004)

1. Date this sheet was completed/updated:

July 2002

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Designation date

Site Reference Number

2. Country:

Spain

3. Name of wetland:

Lago de Caicedo-Yuso y Salinas de Añana

4. Geographical coordinates: Lago de Caicedo-Yuso: 2° 59' 20" W / 42° 46' 55" N
Salinas de Añana 2° 59' 1" W / 42° 48' 15" N

5. Elevation: (average and/or max. & min.)

Lago de Caicedo-Yuso 655 m

Salinas de Añana 566 m

Salinas de Añana 566 MSN

6. Area: (in hectares)

Lago de Caicedo-Yuso: 13. ha.

Salinas de Añana: 12.1 ha.

Total: 25,8 ha

7. Overview: (general summary, in two or three sentences, of the wetland's principal characteristics)

These are two small and extremely unusual wetlands located in the Añana *diapir*, which is the main salty resurgence of many in the so called Cantabrian Deep. The Salinas de Añana are several terraced salt pans lying in a valley and currently being exploited. The Lago de Caicedo-Yuso is the only lacustrine system of the Autonomous Region of the Basque Country, and is unique in the region owing to its origins, morphology and the chemical composition of its waters.

8. Wetland Type (please circle the applicable codes for wetland types; in the present document, the "Ramsar Classification System for Wetland Type" is found on page 9)

marine-coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

inland: L • M • N • O • P • Q • R • Sp • Ss • **Tp**
Ts • U • Va • Vt • W • Xf • Xp • Y • Zg • Zk(b)

human-made: 1 • 2 • 3 • 4 • **5** • 6 • 7 • 8 • 9 • Zk(c)

Please now rank these wetland types by listing them from the most to the least dominant:

Tp-5

9. Ramsar Criteria: (please circle the applicable Criteria; the *Criteria for Identifying Wetlands of International Importance* are reprinted beginning on page 11 of this document.)

1 • **2** • 3 • 4 • 5 • 6 • 7 • 8

Please specify the most significant criterion applicable to the site: 1

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

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

Mikel de Francisco Pastor (IKT, SA)
Granja Modelo, s/n 01192 Arkaute- Araba - SPAIN

12. Justification of the criteria selected under point 9, on previous page. (Please refer to the *Criteria for Identifying Wetlands of International Importance* appended to this document)

The Salinas de Añana contribute to maintaining the cultural values of the area. The exact date when exploitation began is unknown. The first written documents date from the IX century; but exploitation may have begun in Roman times since some archeological sites have been discovered nearby. Exploitation of the salt pans continues, and this is one of the few inland places where salt extraction continues today. In addition, the Salinas de Araña are important for the conservation of the autochthonous variety of *Artemia parthenogenetica*, as it is the northernmost site for the species since the disappearance of the salt pans of Gerri de la Sal (Lleida) and Poza de la Sal (Burgos).

The Lago de Caicedo-Yuso is a unique wetland in its biogeographical context for its origin and chemical composition of its waters, as well as for its hydrological regime, with a tendency towards meromixis. In a natural state this would probably suppose alternation between meromictic and monomictic regimes.

The Lago de Caicedo-Yuso has been nominated as a Site of International Importance due to the presence of species in the Annex II of the “Habitats Directive”, namely *Coenagrion mercuriale*, and for the presence of the following habitats in Annex 1: 1410 -Saline Mediterranean Grasslands (*Juncetalia maritima*), 1510 -Saline Mediterranean Steppes (*Limonietalia*), 3150 -Eutrophic natural lakes with *Magnopotamion* or *Hydrochatirion* vegetation, 6420 -Wet Mediterranean grasslands of tall grasses of *Molinion-Holoschoenion*.

13. General location: (include the nearest large town and its administrative region)

Both wetlands are located in the Valles Alaveses region in the western part of the Álava province, 30 km away from the city of Vitoria. Salinas de Añana is situated in the municipality of Salinas de Añana-Gezaltza, and Lago de Caicedo-Yuso is located in the Lantarón municipality.

14. Physical features: (e.g., geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; catchment area; downstream area; climate)

GEOLOGY AND GEOMORPHOLOGY

Both wetlands are related to the Salinas de Añana diapir. The diapir is an ellipsoidal structure of 13 km², oriented in an E-W direction with a great number of *carniolas* and ophytes within the typical clays of the Triassic. The diapir is the main saline resurgence amongst the numerous found in the Cantabrian Deep.

On the margins of the lake, clays with gypsum, ophytes and recent sediments are easily distinguishable. The Triassic clays are the predominant rock form; the solution of gypsum and the consequent collapse were the origin of the lake formation. The ophytes are present in three masses located in the northern, western and eastern margins of the lake.

ORIGIN

The Lago de Caicedo-Yuso is of karstic origin following the solution and subsequent collapse of gypsum masses. The Salinas de Anaña are of artificial origin taking their source from a salt spring. The exact date when exploitation began is unknown. The first written documents date from the IX century; however, exploitation may have begun in Roman times since some archeological sites have been discovered nearby.

HYDROLOGY

The basin of the Lago de Caicedo-Yuso has a very simple network consisting of a tiny stream, whose waters carry sulphate (54%), bicarbonate (39%), calcium (71%) and magnesium before their entry into the lake. Sodium chloride presence is tripled at the lake's outlet reaching a 15% ionic concentration. It's therefore evident that there is a groundwater influx of saline waters.

The hydrology of the Salinas de Anaña is based on the use of the Santa Engracia salt spring, which gives an almost permanent flow throughout the year of 2 l/s, with a conductivity of 394.100 $\mu\text{S/cm}$.

PHYSICAL AND CHEMICAL WATER PROPERTIES

The main ionic composition of the Lago de Caicedo-Yuso responds to the ionic series Ca-(Mg)-(Na)-SO₄-HCO₃-(Cl). Calcium is the most abundant cation: 60%, followed by magnesium: 20%, and a significant presence of sodium of around 15%, uncommon in continental aquatic systems. Anions, on the other hand, are dominated by sulphates: 50%, followed by bicarbonates: 30%, and an unusual high presence of chloride of almost 20%. Carbonates are very rare.

Generally, ions accumulate in the hypolimnion during stratification, giving a clear gradient in the water column with respect to the epilimnion.

The Santa Engracia spring, which feeds the Salinas de Anaña, has an almost constant flow throughout the year of around 2 l/s, with clear dominance of chloride and sodium, showing concentrations of 153.456 and 99.650 mg/l respectively. Other ions that are present are SO₄⁼ (5.085 mg/l), HCO₃⁻ (194 mg/l), Ca⁺⁺ (1.834 mg/l) and Mg⁺⁺ (300 mg/l).

MORPHOMETRICS

The Salinas de Anaña are a set of salt pans that occupy the whole of the valley.

The Lago de Caicedo-Yuso has a circular-like shape at highest level, with a principal axis in an ENE-WSW direction. A dense community of heliophytes has established along a large gentle sloping zone circling the lake except for its northern side. This community has its greatest development in the eastern part, at the entry of the lake stream. Thus, with a surface close to 11 ha, 6 ha of which are of open water at its maximum normal level, and a maximum depth of over 24 m, the Lago de Caicedo-Yuso is unique in its geographical setting.

It has a single basin with the shape of a doline, formed by the development of cryptokarst, which is responsible for the genesis of the funnel shaped basin.

CATCHMENT AREA

The catchment area of Lago de Caicedo-Yuso has a very simple network of a single stream, the lake stream, which has its source near the village of Caicedo-Yuso at 720 m. The stream

runs for 1700 m before discharging its waters to the lake at an altitude of 655 m. The basin has a surface area of 291,5 ha.

CLIMATOLOGY

The Lago de Caicedo-Yuso and Salinas de Añana are located in a transition zone between the Atlantic and Mediterranean climates. According to Thornthwaite, climate in the area is subhumid-humid close to subhumid-dry. Winters are cold with a mean January temperature of 4,7°C, and summers are fresh though with marked diurnal oscillations. July is the warmest month with a mean temperature of 19,8°C. The mean rainfall is 656 mm (data from the Salinas de Añana station), reaching values of 745 or 872 mm in wet or very wet years, and of 566 or 439 mm in dry or very dry years.

15. Hydrological values: (groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.)

16. Ecological features: (main habitats and vegetation types)

The Lago de Caicedo-Yuso comprises two closely related subsystems: a marshy system and a lacustrine system. Marshy vegetation surrounds the lake except on its northernmost portion, where its growth is hindered by the depth of the water. The band of marshy vegetation furthest away from the water has almost disappeared due to drainage. Closer to the shore, a band of reed beds with abundance of heliophytes constitutes a habitat of great importance for birds. The shallow floors of the lake have specialized aquatic vegetation of nutritional value to aquatic birds.

There is a small salt spring whose brackish waters mix with those of the lake, creating a salinity gradient which is reflected in the flora.

Regarding the Salinas de Añana, a very specialized halophyte flora is found both in the salt spring and in the artificial salt pans. Its maximum development is in the spring. Abundant colonies of ephemeral annual plants are noteworthy.

17. Noteworthy flora: (indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc.)

Concerning the plant species of major interest in the area of Lago de Caicedo-Yuso, one must highlight those associated with humid environments (reed beds, grasses, etc., particularly those halophyte species linked to the salt spring, which have a disjoint distribution relative to the coast. The following species are noteworthy: *Berula erecta*, *Ranunculus peltatus subsp. baudotii*, *Potamogeton coloratus*, *Alopecurus geniculatus*, *Spergularia marina*, *Puccinellia fasciculata*, *Hordeum secalinum*, *Parapholis incurva*, *Chamaespartium sagittale*, *Myriophyllum verticillatum*, *Ophioglossum vulgatum*, *Veronia scutellata*, *Utricularia vulgaris*, *Juncus gerardi*, *J. acutus acutus*, *Scirpus maritimus*, *Carex divisa*, *C. acutiformis*, *C. distans* and *Dactylorhiza incarnata*.

18. Noteworthy fauna: (indicating, e.g., which species are unique, rare, endangered, abundant or biogeographically important; include count data, etc.)

a) Invertebrate communities.

Highlights are the dragonfly *Coenagrion mercuriale* in the lake stream and the brine shrimp *Artemia parthenogenetica* in the Salinas de Añana – Getzaga.

(b) Vertebrate communities

The Lago de Caicedo-Yuso is of regional importance for several aquatic birds, given the absence of large wetlands in the area. Breeding bird species include *Tachybaptus ruficollis*, *Anas platyrhynchos*, *Fulica atra*, *Gallinula chloropus*, *Rallus aquaticus*, *Acrocephalus arundinaceus* and *Cisticola juncidis*.

Aythya ferina, *A. fuliginosa*, *Emberiza shoeniclus* and *Gallinago gallinago* visit the lake during the wintertime, though in very small numbers.

19. Social and cultural values: (e.g., fisheries production, forestry, religious importance, archaeological site, etc.)

Artisanal salt extraction bears reflects a long lived culture. Several archeological sites have been discovered in the vicinity, though the relationship of these communities with the salt pans and the relative importance for their development is unknown, yet presumably they knew about their existence. If no one did it before, what seems sure is that salt exploitation began already during Roman times.

The Salinas only begin to appear in historical documents in the IX century, when they were owned by the nearby Tobillas Monastery. The importance of this salt valley led to the grant of several royal privileges.

20. Land tenure/ownership of: (a) site (b) surrounding area

a) Site

The salt spring belongs to the owners of the salt pans. There is a considerable fragmentation of property in the area.

The Lago de Caicedo-Yuso belongs to the Administrative Board of Caicedo - Yuso

(b) Surrounding area

The surrounding areas of the Salinas de Añana are privately owned.

The surrounding areas of the lake are for the most part privately owned, except for the forested zones, which are owned by the Administrative Board of Caicedo – Yuso.

21. Current land use: (a) site (b) surroundings/catchment

(a) Site

Within the Salinas de Añana, a non-industrial salt exploitation continues today. This is carried out during the summer months, because water evaporation is achieved by the action of the sun and the wind. Such activity has declined notoriously, and most salt works are in ruins. When salt extraction was at its highest, quantities of over 8000 tons/year were produced, which is around half of what the salt spring yearly yields.

Recently, an industrial plant has been established down the valley, which makes use of the remaining brine and by means of a co-generation process generates both salt and energy.

Regarding the lake, its only current use is for water extraction for crop irrigation.

(b) Surrounding area

The village of Salinas de Añana – Getzaga borders the salt pans at their northern edge, and the monastery of San Juan de Acre borders them at the east border. The slopes surrounding the rest of the salt pans are covered by grass and scrubs that have occasional use for grazing. The rest of the basin is covered to different extents by forested areas, non-irrigated farming land and small populated nuclei.

The Lago de Caicedo-Yuso is surrounded by areas of non-irrigated and irrigated land and forested areas, these consisting of different types of forests as well as scrubs and grasslands. The small village of Arreo, currently practically uninhabited, lies in the upper part of the basin.

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

(a) At the site

The economic changes of recent years and developments in transport have contributed to the decline of salt extraction activity. Today, very few families still mine the salt. As the salt pans and the complex of aqueducts that distributes water to them need a constant maintenance, many of them are now in ruins.

Regarding the Lago de Caicedo-Yuso, the principal threat is that of water extraction for irrigation. This activity is illegal but has not been possible to stop it. The extracted volume is around 50,000 m³, varying depending on the year. This represents the extraction of 15% the volume of the lake and leads to the drying up of 40% of the surface of the lake. Consequently, the following impacts occur:

- Desiccation of the stream. Elimination of riverside communities
- Desiccation of the marshy areas surrounding the lake:
 - Displacement of heliophyte communities
 - Elimination of littoral habitats and refuges
 - Elimination of macrophyte submerged aquatic beds. Liberation of nutrients to the water.
- Active extraction and disruption of plankton communities
- Altering of the natural rhythm of the natural renovation rate
- Altering of the mixing-stratification cycle
- Loss of chemical singularity in the water
- Bank instability and collapse. Acceleration of silting processes.

Other disturbances in the wetland are the pressure for crop areas, which reduces areas covered by riparian forest and heliophytes, and the influx of nutrients and other substances to the aquatic ecosystem, which causes the displacement and/or disappearance of autochthonous species and changes in the food chains.

(b) Around the site

In the case of Salinas de Añana, the main threats to conservation are the several mining exploration projects of opiphyte masses in the diapir, which could originate vibrations that could risk the conservation of this peculiar enclave.

In the case of Lago de Caicedo-Yuso, the main threats from the surrounding area mostly relate to the different uses of the basin, especially those of agriculture and cattle raising, as this may lead to an increase in the nutrient load as a consequence of changes in the crop techniques or by increase in the intensity. No establishment of industries or population increase in the basin is foreseen.

23. Conservation measures taken: (national category and legal status of protected areas - including any boundary changes which have been made; management practices; whether an officially approved management plan exists and whether it has been implemented)

The Salinas de Añana have been declared Artistic-Historical Monuments of National Importance by the Decree 265/1987 of July 17.

The Lago de Caicedo-Yuso has been declared a Hunting Refuge.

24. Conservation measures proposed but not yet implemented: (e.g., management plan in preparation; officially proposed as a protected area, etc.)

The Lago de Caicedo-Yuso has been included in the proposal of “Community Important Places”, following the “Habitats Directive”.

The procedure of declaration of Lago de Caicedo-Yuso as a Protected Biotope has started, in compliance with the 16/94 Law of Nature Conservation of the Basque Country.

Both wetlands are included in the Wetlands Territorial Plan of the Basque Country.

The Restoration Plan for Salinas de Añana – Gesaltza is being drafted at the moment.

25. Current scientific research and facilities: (e.g., details of current projects; existence of field station, etc.)

Currently, some research is ongoing about the hydrological balance of surface water and groundwater in the Lago de Caicedo-Yuso.

In the Salinas de Añana there is an ongoing study to describe the invertebrates living there.

26. Current conservation education: (e.g., visitors centre, hides, info booklet, facilities for school visits, etc.)

There are no environmental education programs currently operating.

27. Current recreation and tourism: (state if wetland is used for recreation/tourism; indicate type and frequency/intensity)

The amazing white steps of the salt pans and platforms, all crowded in the narrow canyon where the river Muera runs, constitute one of the most unusual and attractive landscapes of the Basque

Country. Therefore, tourist visits are frequent, even though there is no infrastructure to receive them.

28. Jurisdiction: (territorial, e.g. state/region, and functional, e.g. Dept of Agriculture/Dept. of Environment, etc.)

Territorial: The Salinas de Añana belong to the municipality of “Salinas de Añana – Gezaltza”. The Lago de Caicedo-Yuso belongs to the municipality of “Lantarón” (both in the Álava province, Autonomous Region of the Basque Country, Spain.)

Functional: The management of both wetlands is in the hands of the “Foral” Committee of Alava, both through the Service of Nature Conservation and through the Culture Service.

29. Management authority: (name and address of local body directly responsible for managing the wetland)

Servicio de Conservación de la Naturaleza
Diputación Foral de Álava
Plaza de la Provincia s/n
01001 Vitoria-Gasteiz. España
Telf.- 34-945-181818

30. Bibliographical references: (scientific/technical only)

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