

Information Sheet on Ramsar Wetlands

1. **Date this sheet was completed/updated:** 3 September 1997

2. **Country:** SPAIN

3. **Name of wetland:** Lake Pitillas

4. **Geographical coordinates:**

42°24'40"N

1°34'40"W

5. **Altitude:** 350 metres above sea level

6. **Area:** 216 hectares

7. **Overview:**

Lake Pitillas is a permanent, slightly saline body of water of endorheic origin, connected by a broad network of tributary ravines that drain a water basin of some 7,639 hectares. The original wetland was modified by the construction of a containment dam. The average depth is approximately 2 metres. It is a very important lake for the nesting and wintering of many significant species of aquatic birds and a resting place for migratory birds that use the western Pyrenean flyway near Navarre in their pre-nuptial and post-nuptial migrations.

8. **Wetland type:**

Sp, 6

9. **Ramsar criteria:**

3c

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

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

Servicio de Medio Ambiente
Dirección General de Medio Ambiente
Gobierno de Navarra
Pamplona

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

Lake Pitillas merits designation as a wetland of international importance in function of aquatic birdlife because:

- There has been a steady presence of *Botaurus stellaris*, which has been nesting here since 1991.

Since 1989, *Porzana pusilla* has been recorded here, but there is no evidence of nesting.

This site is the wintering site for 6.4 per cent of the population of *Circus aeruginosus* in Spain. This proportion increases to 10.6 per cent when the larger area of Pitillas is included.

This site witnesses 9.35 per cent of the nesting population of *Circus aeruginosus* in Spain.

13. General location:

This wetland is located 3 kilometres from the town of Pitillas (less than 5000 inhabitants), in the municipal areas of Pitillas and Santacara, in the Navarre autonomous region.

14. Physical features:

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15. Hydrological values:

This area is characterized by a Mediterranean climate. Precipitation is light and usually comes from Atlantic storms associated with winds from the northwest and summer storms. Average annual precipitation is 525 litres per square metre with a marked torrential nature. There are 2,500 hours of sunshine per year, with an abundance of cloudless days because of the influence of the *cierzo*, a northwesterly wind that clears the skies. The average annual temperature ranges between 13 and 14°C. According to the classification of Rivas-Martínez (1994), the area of Pitillas is part, within the Mediterranean region, of the upper horizon of the middle Mediterranean bioclimate stage. Winters are cold with dry cloudy days and a precipitation between 600 and 800 mm. The index of continentality (Ic) calculated for the station of Logroño is 46.4. This places it in the semicontinental category.

Lake Pitillas is located on the geological formation of the Ebro depression. This formation consists of an important group of detritus Tertiary materials that are sometimes several hundred metres thick. From the point of view of lithology, these Tertiary soils are formed by clays, muds and sands in paleochannels, which are often conglomerates locally, with dominant tones of brown and yellow, in decreasing granulation from northeast to southwest. These materials originated in deposits in the river basin that evolved from north to south. There are conglomerate paleochannels in the northeast of the basin, while in the southwest, there is clay on top of other grained materials. On top of these Tertiary materials, a thin covering layer of Quaternary materials have developed, which derive from materials carried by the Aragón River in which there is a river terrace. The lithology is gravel, sands and mud. In the area studied, there is very little river terrace.

The materials present in the area have a clearly distinct hydrogeological behaviour. On the one hand, the clays and muds with layers of sand from the Tertiary, in which the lake is set, act as an almost completely impermeable unit, given their low porosity. Only the sand provides narrow channels. Given this impermeability, these materials are considered to form an impermeable base. All of the dominant geological formation has dissolved salts, transported by runoff through dendritic gullies and ravines that cut up this area.

As for the Quaternary materials present in this area, the high alluvial terraces of the Aragón River are poor aquifers, because they are hung terraces and are small, retaining water for a very short time. Furthermore,

the gravels in these terraces are very consolidated and the presence of a calcarious level at the surface prevents percolation.

Naturally endorheic Lake Pitillas is modified by a containment dam in order to increase its capacity. It now occupies approximately 300 hectares, and it is never more than 2 metres deep. This water basin is in the Ebro depression, between the Sierra de Ujué and the right bank of the Aragón River. The basin has an area of approximately 7,639 hectares. It has two main streams, the Pozo Pastor and Bescós, fed by a series of tributaries that descend from Zaramendil in the north and San Blas, Pipiratu and Urtiaga in the northeast to Lake Pitillas where they empty their water. The morphology of the basin is dendritic, characterized by an arborescent ramification in which the tributaries join the main stream at sharp angles. This indicates homogeneous soils and occurs in areas of soft sedimentary stone.

16. Ecological features:

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17. Noteworthy flora:

The dominant vegetative association of ground cover on this upper-middle Mediterranean area in Navarre is the basophile, dry, Castellano-Argonés reed *Querceto rotundifoliae sigmetum*. Its thermic range is between 200 and 350 metres in altitude and in an area of precipitation between 350 and 600 mm (Rivas Martinez et al., 1991). This type of reed develops on substrata rich in base elements (limestone, calcareous rocks, *marga* and chalk *marga*), which define the vegetative association that grows in the hills on the remains of the paleochannels that surrounded Lake Pitillas. The characteristic species associated with this reed are *Bupleurum rigidum*, *Jasminum fruticans*, *Juniperus oxycedrus*, *J. phoenicea*, *Osyris alba*, *Phillyrea augustifolia* and *Rubia peregrina*.

In the surrounding land, there are shrub communities and grass series formed by groves of Kermes oak, patches of rosemary, thyme, sage and dry pasture with frequent populations of *Lygeum spartum* (*albardin*), *Stipa offneri* and *Brachypodium retusum*.

Vegetation requiring high levels of nitrogen and salt tolerant plants complete the rest of the mosaic of the associations determined by climate in this area.

Lake Pitillas is part of the Mediterranean region in the Bardenas-Monegros section on the northern border of the Bardenero subsection. This section and subsection are characterized by groves of Kermes oak (*Quercus coccifera*), the *Agrostio stoloniferae-Tamaricetum gallicae* halophile vegetation, other halophytes and accompanying salt-tolerant vegetation requiring high concentrations of nitrogen are represented in this area by vegetative associations linked to the endorheic conditions, such as the salt marshes of *Suaedetum braun-blanquetii*, *Sasolo-Artemisietum* and accompanying herbaceous vegetation.

Lake Pitillas is a typical example of a lake of endorheic origin. It is modified by a dam and drainage canals, although there are processes that produce surface salt deposits in the surrounding areas.

The following typical vegetation is found in layers from the centre outward:

- Submerged grasses occupy parts of the lake that remain flooded most of the year, but their depth is usually no more than 2 metres. In depths of

more than 2 metres, the plants have difficulty placing their roots. The most common species are *Chara* spp., which forms large underwater beds. Several species of Ranales dot the area closest to the shore: *Ranunculus aquatilis* and *Ranunculus fluitans*. Other hydrophytic plants, such as the *Potamogeton pectinatus*, complete the list of underwater species most frequent in this lake.

- Reeds are found in a broad, very thick band of heliophilic vegetation in and around the central body of water, formed primarily by *Phragmites communis*, which colonizes all areas that remain flooded for most of the year or where soil humidity is high. The ease with which this reed expands allows it to invade and dominate the shore, often eliminating other species. The reed *Typha angustifolia* shares this habitat. Other plants such as the Cyperaceae *Scirpus triquetrus* grow among the reeds, also capable of living with their rhizomes and the lower parts of the plant submerged in water. The association that characterizes these formations is *Typha angustifoliae-Scirpetum tabernaemontani*. The dense belts of emergent heliophilic Monocotyledoneans grow to more than 2 metres. Dominated by reeds, this shore forms an almost impenetrable thicket. This characteristic assumes great importance in the biology and behaviour of many animal species, especially birds, to which this provides a safe habitat during the period of reproduction.

- A belt of reeds that is partially covered with water only part of the time forms a band of vegetation of Monocotyledons belonging to the Juncaceae and Cyperaceae families. Most important is *Scirpus maritimus*, which colonizes large areas immediately outside the beds of reeds. The species that characterizes this association is *Scirpetum maritimi*. The Juncaceae is less dense than the bed of reeds that grow around the lake. The dominant species is *Juncus maritimus*, a plant with stiff and sharp leaves and irregular florescence that grows on stalks of one metre. Other low-growing reeds such as *Juncus bulbosus* and *J. gerardii* occupy large parts of Pitillas. A large number of these reeds are in the *Juncion maritimi* association. Another species that is on this shore but which tends to grow separate from the water because of its use of the water table and its non-paludicolous nature is *Scirpus holoschoenus*, which is always found in all of the reservoirs in Navarre, in areas where there is soil humidity but little surface water.

- Surrounding xerophytic and halophytic pastures are dominated by *Aeluropus littoralis*, *Agropyrum repens*, *Agrostis stolonifera* and *Hordeum maritimum* and *Puccinellia festuciformis tenuifolia*. *Lygeum spartum* grows in the outer band around the lake, in places that are especially dry on the interface with steppe scrubland that forms patches in the wasteland. Rosemary (*Rosmarinus officinalis*), thyme (*Thymus vulgaris*), lavender (*Lavandula latifolia*) and black juniper (*Juniperus phoenicea*) stand out among the plants in this scrubland and do not form part of the lacustrine vegetation (Loidi and Bascones, 1995). The driest depressions frequently undergo processes of rising salts, giving the soil a high pH. They are colonized by halophytes, specialized in living in saline soils, such as the Chenopodiaceae *Salicornia patula* (*S. ramosissima*) and *Suaeda braun-blauqueti*, forming the *Suaedo braun-blauqueti-Salicornietum patulae* and *Suaedetum braun-blauquetii* associations.

18. Noteworthy fauna:

There is only one species recorded of strictly aquatic mammal, the *Arvicola sapidus*, whose diet is basically herbivore (grasses, reeds, aquatic plants) complemented with insects and tadpoles. During the breeding period it can become a habitual predator of chicks and eggs of aquatic birds. Along the shores are found *Apodemus silvaticus*, *Crocidura russula*, *Erinaceus europeus*,

Mus musculus, *Rattus rattus* and *Suncus etruscus*. Other mammals that visit the lake are fox (*Vulpes vulpes*), wild boar (*Sus scrofa*), opossum (*Mustela nivalis*), badger (*Meles meles*), genet (*Genetta genetta*) and polecat (*Putorius putorius*).

The following amphibians and reptiles are recorded with an indication of their conservation status as assigned in the "Catalogue of Endangered Species in Navarre" (NA = not endangered; DI = of special interest; SH = vulnerable to changes in habitat): *Bufo bufo* (NA), *B. calamita* (NA), *Chalcides chalcides* (NA), *Coronella girondica* (NA), *Discoglossus galganoi* (DI), *Emys orbicularis* (SH), *Lacerta lepida* (NA), *Natrix maura* (NA), *Natrix natrix* (NA), *Pelobates cultripes* (DI), *Pelodytes punctatus* (NA), *Podarcis hispanica* (NA), *Rana perezi* (NA), *Triturus helveticus* (NA) and *T. marmoratus* (NA).

The large amount of water accumulated at Pitillas is the reason that there is an important and dense population of amphibians, especially *Pelobates cultripes*. The special characteristics of the gullies that drain into the lake, the only humid areas in wide and monotonous areas of crops, play a special role as refuge and habitat for the reproduction of species dependent on water, at least in this phase of its cycle. Several of these species, such as the European galapagos (*Emys orbicularis*), *Hyla arborea*, *Pelodytes punctatus* and *Rana perezi*, have adopted to the beds of reeds and the deeper marshes, in the ponds where water stands in the dry season. Other genera, (*Bufo* and *Pelodytes*), seek out shallow ponds in the pastures in the gullies.

Data on fish are from 1979 and are based on observations of fishermen. The following fish have been reported: carp, *gambusia* and tench. In this case, the presence or absence of some species does not provide information on the unique ecological characteristics of this wetland.

Pitillas is the largest wetland in Navarre and, as a result, benefits from peaceful conditions, given its status as a nature reserve. This is a reason why the first reproducing population of *garza real* was established here in 1990. In 1991, it was quantitatively and qualitatively the most important wetland in Navarre with 61.11 per cent of the confirmed nesting species in Navarre, 78.6 per cent of possible, probable or confirmed nesting and the presence of 49.3 to 62.9 per cent of the total of reproducing couples. The largest populations of nesting ducks in Navarre (83 to 90.9 per cent of the population), Western marsh-harrier (46.4-49.1 per cent) and woodhens (15.5-26.2 per cent) are concentrated here. Even subtracting the couples of azulón from the total number of ducks, 33.3-35.5 per cent of all these birds were recorded in Pitillas.

All of the species of nesting Podicipedidae are present in this wetland, which occupies third place in quantitative importance for this family. At the same time, all species of rails and ducks are present.

In 1991, it had the fifth colony in importance of *garza imperial*, with between 40 and 50 per cent of the population of Western marsh-harrier, plus 75 to 90 per cent of azulón and a wide range of species including *anade friso*, *pato colorado*, *pato cuchara*, *porrón comun* and *zampullin cuellinegro*. It is one of the most homogeneous environments. After Las Cañas Reservoir, it is the most important wetland in terms of variety of species of Ardeida including the first and most important site for reproduction of the *Ardea cinerea* in Navarre.

The regular presence of *Porzana pusilla* since 1989 and *Botaurus stellaris* since 1991 have been recorded, including reproduction.

Pitillas is the home to an important population of wintering Western marsh-harrier in Navarre. The most recent winter survey in Spain (December 1992, co-ordinated by SEO) gave a total figure of 1,713 specimens. In order to evaluate the importance of Pitillas, let's consider significant the number of wintering birds in January 1993 with 109 specimens, an amount usually found in this lake. This would represent 6.4 per cent of the total number recorded in Spain. But by taking the wetland together with its area of influence, it is noticed that Pitillas represents 10.6 per cent of the wintering Western marsh-harriers in Spain. In 1997, the presence of *calamón* (*Porphyro porphyro*) was detected from March onward.

19. Social and cultural values:

Nothing of importance to report.

20. Land tenure/ownership of:

a) at the site - Most of this area is communal, belonging to the Ayuntamiento de Pitillas. The section in the municipality of Santacara belongs to the Comunidad Foral.

21. Current land use:

a) The area occupied by the area of water in this wetland is considered to be unproductive land.

b) in the surrounding area - It is surrounded on the north, northeast and east by an association of pasture and scrubland in which the scrubland occupies approximately 30 per cent, to the southeast by intensive crops (*barbecho blanco*) interspersed with an association of pasture and fallow land that occupies 30 per cent in which the proportion of fallow land is approximately 40 per cent. To the south, there are intensive crops (*barbecho blanco*) and to the southwest a mosaic of vineyards (60 per cent) and intensive crops (*barbecho blanco*); to the west there are intensive crops and to the northwest vineyards and intensive crops (*barbecho blanco*).

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

At the site, a containment dam was constructed at the original lake.

23. Conservation measures taken:

- This area was declared a nature reserve (RN-27) by Foral law 6/1987, dated 10 April 1987, on regional urban planning regulations for land conservation and use.

- Declaration of a buffer area around RN-27, by Foral decree 307/1996 of 2 September 1996, which approved the posting of signs around the buffer area of certain reserves. A description of the area is included in Foral law 9/1996 of 17 June 1996 on nature areas in Navarre.

Designation as a Z.E.P.A. by decree 79/409/CEE in 1990.

Inclusion in the inventory of wetlands in Navarre by Foral decree 4/1997 of 13 January 1997.

The management and use plan for RN-27 was approved by Foral decree 310/1996 of 2 September 1996.

24. Conservation measures proposed but not yet implemented:

During the period 1996-2000, LIFE project B4-3200/97/251 will be carried out to improve the habitat and the status of the *avetoro* in Lake Pitillas.

25. Current scientific research and facilities:

Development of the *avetoro* project with financial support from LIFE aimed at promoting awareness about the existing population and the use of this habitat.

26. Current conservation education:

A visitors centre has been constructed, which is expected to be completed in 1997-98. A guard-warden is hired each year to monitor the nature area and serve as support for visitors and programmes for school children.

27. Current recreation and tourism:

There is no significant tourism and recreation.

28. Jurisdiction:

Territorial: Regional government and municipality

Administration: Dirección General de Medio Ambiente, Ordenación del Territorio y Vivienda of the government of Navarre

29. Management authority:

Servicio de Medio Ambiente
Dirección General de Medio Ambiente
Gobierno de Navarra
Pamplona

30. Bibliographical references: