The Ramsar Convention
on Wetlands

Ramsar Wetlands

Information Sheet of "**Lagoon of Pateira de Fermentelos and Valleys of rivers Águeda and Cértima**", Portugal

Information Sheet on Ramsar Wetlands (RIS)

Available for download from http://www.ramsar.org/ris/key_ris_index.htm.

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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

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DD MM YY

Designation date | Site Reference Number

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2. Date this sheet was completed/updated:

27th July 2012

3. Country:

Portugal

4. Name of the Ramsar site:

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Lagoon of Pateira de Fermentelos and Valleys of rivers Águeda and Cértima

5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only)**:**
a) Designation of a new Ramsar site X;
b) Updated information on an existing Ramsar site ❑

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6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area

The Ramsar site boundary and site area are unchanged: ❑

or
If the site boundary has changed:
i) the boundary has been delineated more accurately ❑; or
ii) the boundary has been extended ❑; or
iii) the boundary has been restricted** ❑
and/or
If the site area has changed:
i) the area has been measured more accurately ❑; or
ii) the area has been extended ❑; or
iii) the area has been reduced** ❑

** **Important note**: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

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7. Map of site:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

i**) a hard copy** (required for inclusion of site in the Ramsar List): √

ii**) an electronic format** (e.g. a JPEG or ArcView image): √

iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables**: √.

b) Describe briefly the type of boundary delineation applied:

To better include all natural relevant aspects, the boundary delineation applied consisted of a combined adjustment to the boundaries of the Natura 2000 network (Special Protection Area of the Ria of Aveiro-PTZPE0004), in some areas to the physical limits of the municipalities (e.g. roads), the limit of habitats that occur in the area and/or the limit of the flood area.

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8. Geographical coordinates (latitude/longitude, in degrees and minutes):

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

GS84: 8º 30' 28.08"W; 40º 33' 51.39"N (ETRS89 PT TM06: – 31732; 99558)

9. General location:

The area is located in the Center region of Portugal, in the NUT III Level area of Baixo Vouga. The boundaries of the proposal cover partially the Municipalities of Águeda (parishes of Espinhel, Fermentelos, Óis da Ribeira, Aguada de Baixo, Barrô and Travassô), Aveiro (parishes of Requeixo and Nossa Senhora de Fátima) and Oliveira do Bairro (parishes of Oliveira do Bairro and Oiã). The nearest town is the city of Águeda.

10. Elevation:

The elevation of the area goes from a range of 4 meters minimum to approximately 70 meters maximum high.

11. Area:

The area of the site is 1559 hectares. The area occupied by wetlands is 459 hectares.

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The lake commonly referred to as Pateira de Fermentelos stands out in the regional, national, and even international contexts. One of the largest natural freshwater lagoons in the Iberian Peninsula (hydrographical basin of the river Vouga) has a great importance for the maintenance of the natural systems of the surrounding area, and for the local populations in terms of natural, socio-economic and tourist contexts supporting activities such as fishing, bird-watching, hiking, other leisure activities, also agriculture. The Pateira de Fermentelos presents the characteristics of a semi-lentic system integrating the Special Protection Area of the Ria de Aveiro (PTZPE0004) where several species with different national and international protection status occur, as well as their associated habitats and ecosystems

13. Ramsar Criteria:

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1	2	3	4	5	6	7	8	9
☒	☒	☐	☒	☐	☐	☐	☒	☐

14. Justification for the application of each Criterion listed in 13 above:
Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar Criteria 1 – The site contains one of the largest freshwater lagoons of the Iberian Peninsula with the correspondent mosaic wetlands habitats, reed beds, marshland and associated habitats, as well as riparian vegetation, complete with transition areas between. Also includes the natural floodplain system of Águeda and Cértima rivers, directly connected to the lagoon ecosystems, with areas with irrigation channels and rice fields in the areas located in the south.

The general ecological features create conditions to occur some classified and protected habitats in the area such as Habitat 3150 "Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation", Habitat 3280 Constantly flowing Mediterranean rivers with Paspalo-Agrostidion species and hanging curtains of Salix and *Populus alba* and the priority habitat type Habitat 91E0* "Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)". Recent studies also mention the occurrence of Habitat 1330 and 1130.

Ramsar Criteria 2 – This site supports populations of threatened species, listed under the Bonn and Berne Convention, CITES and Council Directive 2009/147/EC on the conservation of wild birds. Concerning the Bird Directive occur 15 species within Annex I *e.g. Milvus migrans*, *Himantopus himantopus, Charadrius alexandrinus, Alcedo atthis, Sylvia undata*, etc.. Twelve birds occur with the status of vulnerable (e.g. *Ixobrychus minutus*, *Circus aeruginosus, Porphyrio porphyrio)* and one endangered (e.g. *Ardea purpurea*).
Regarding the herpetofauna occur in Pateira (and contiguous areas) several species such as *Salamandra salamandra, Hyla arborea, Bufo bufo, Anguis fragilis* among others listed in the Annex of the Habitats Directive (Annex II, IV and V) occur. Otter (*Lutra lutra*) LC status in Portugal, protected by several legal diplomas, can be seen, and it breeds in the area included.

Ramsar Criteria 4 - The existence of areas of flooded vegetation, marshland, important areas of reed (*Phragmites communis*), together with bulrush (*Typha* sp.) and zebra rush (*Scirpus lacustris*), as well as riparian forest, and agricultural areas (where occur habitats of Bocage) which represent important feeding, reproduction and refuge for several species of migratory birds. In the area occurs one of the largest communities of *Ardea purpurea* in Portugal. The conservation status of the species went from "vulnerable" to "endangered" under the Red Book of Vertebrates of Portugal (Cabral *et al*., 2005). The colony that occurs/breeds in Pateira represents, together with the rest of the Ria de Aveiro ecosystem, at least 50% of the nesting population in Portugal of this specie of conservation priority.

It should also be referred the occurrence of several migrating Passeriformes from woods and scrubland, Passeriformes from reed-plots and riparian galleries, as well as Anatidae species.

Among the different species of bivalve which can be observed at the Vouga water basin (e.g. *Unio delphinus*), there is one at the Pateira which is emblematic because of its (big) size and ecologic value – the *Anodonta* sp.. These populations are very sensitive to sudden and abrupt changes of habitat, thus playing an essential role in the ecological systems. The bivalves are regarded as sentinel species, maintaining the ecological integrity through its role filtrating, removing watercourses phytoplankton, bacteria and suspended solids, and also indicators of the condition and integrity of habitat (given which are sensitive to disturbances both physical and chemical).

Ramsar Criteria 8 - At the Pateira and the adjacent water system fish finds ecological conditions that cater for the vitality and subsistence of the diverse communities, conditions which allow refuge and spawning during the breeding season. Because the area is part of the river Vouga water basin, species with community protection status (according to Annex II and/or Annex V of the Habitats Directive), either exist or may occur in the lake: Iberian barbel (*Barbus bocagei*), Iberian nase (*Chondrostoma polylepis*), Ruivaco (*Rutilus macrolepidotus*), Brook lamprey (*Lampetra planeri* - classified as CR- critically endangered, by the Red Book of Vertebrates of Portuguese), Shad (*Alosa alosa* - classified as EN- endangered, by the Red Book of Vertebrates of Portuguese), Sea lamprey (*Petromyzon marinus*) and Twaid shad (*Alosa fallax*) (both classified as VU- vulnerable, by the Red Book of Vertebrates of Portuguese). Other species occur, such as the Thicklip grey mullet (*Chelon labrosus*), the Bordallo (*Leucistus carolitertii*), the Loach (*Cobitis calderoni*), the European eel (*Anguilla anguilla*), etc.. Regarding the European eel registered on the Red Book as an endangered species, the European eel occurs in the Pateira because of its connection with the rivers Águeda and Vouga.

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15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

1) Mediterranean

2) The area is located in the transition between the two climatic regions the Eurosiberian and Mediterranean: SuperDistrito Miniense Litoral and Subsector Beirense Litorar

b) biogeographic regionalisation scheme:

1) EU Habitats Directive

2) (citation from Conde, 2007 quote Rivas-Martínez *et al.,* 1999

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16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Historically, the Pateira must be considered an ancient wide sea-arm where the rivers Cértima, Águeda, and Vouga flowed separately into before the Ria de Aveiro was formed. That sea-arm closed by the silting of the three rivers caused the appearance of a single water course – the river Vouga -, therefore the mouth of the river moved much farther northwest, just like nowadays (Almeida, 2006). Pinho *et al.* (1988) cit Gomes Andrade writes about the Pateira, that the Certoma valley at that point used to be firm land, covered by thick woods, amongst which the river flowed carelessly.

Moreover, according to Pinho *et al*, 1988, it seems admissible to suppose the area would have been extremely rich both in terms of fauna and flora, though the references to these are scarce.

The Pateira would have started taking shape at the end of the XVth century, probably even during the Middle Age, because of the recurrent floods on the rivers Certoma and Águeda and their surrounding meadows. Nowadays, the Pateira corresponds to the silting and spreading of the river Cértima, near the point where it meets the river Águeda.

The largest natural fresh water lake in the Iberian Peninsula presently takes variable areas and assumes different depths, according to the season an average of 2 meters depth with permanent water which, at its maximum extent, encompasses more than 5 km^2. These extend on their vast majority over the municipality of Águeda, but they also include the municipalities of Oliveira do Bairro and Aveiro. Hydrographically, the lake is part of the drainage area of the river Cértima, which in its turn is inserted in hydrographical basin of the Águeda, which is part of the hydrographical basin of the river Vouga. The lake is maintained by the river Cértima (upstream), by the Pano brook (to the west), occasionally by other streams, and underground sources (the Aveiro Cretacic aquifer), with the Cértima as the main water course conditioning the lake's hydrology and physical chemical properties.

On what pertains to the relief of the terrain, the environs of the Pateira features an easy relief to the west, registering the highest altitude area at 50 meters in Fermentelos (municipality of Águeda). To the west, in the Espinhel civil parish, there is an elevation reaching 78 meters high, also revealing slopes with some impact, considering the features of the surrounding area. To the northwest, approximately between Oliveirinha and Requeixo (municipality of Aveiro), there is an extent of territory with an altitude between 50 and 70 meters and soft slopes rolling towards the Pateira. To the southwest, the smooth relief of low altitude harvest fields on the left bank of the river Cértima and Perrães run along the Pateira.

Pateira is surrounded by outcrops of detrital sedimentary rocks, mainly continental, of Cretaceous age in the West, North and South, from the Triassic at East. At the top of the flattened Mesozoic outcrop occur Neogene terraces. The fund is mostly covered by alluvial mud and silt-clay which, in the valley of Cértima display areas with sand and grit well calibrated. The shape and position of the lagoon are related to an elongated depression, 12 km, stretching from Aguada de Baixo to Eirol. It reveals a strong structural control, conditioning, particularly for structures NW-SE and NE-SW, which intersect roughly N-S.

The Pateira of Fermentelos water quality seems to reflect the Cértima river quality and, in a smaller extent, the drained phreatic aquifers and the Pano stream contribution. On the other hand, hydrobiogeochemical processes that take place in the lagoon and control elements speciation influence the lagoon's water quality. Regarding the chemical and biotic characteristics of elements speciation may be plant uptake, clay adsorption, organic matter complexation, carbonate, sulphate and iron oxyhydroxides co-precipitation. The water quality of the phreatic and semi-confined aquifers seems to be the result of rainwater interaction with soil components and the aquifer matrix.

In what concerns to the main general climate characteristics, the area is influenced by a Temperate and Mediterranean climate that, due to its location between the coast and mountain first set (Serra do Caramulo) which opposes the progress of maritime air masses into the interior, is strongly influenced by the Atlantic Ocean (maritime-type climate). Summers are mild type, with an average maximum temperature of the warmest month (August) of about 28° C. The winters are kind of cool with average minimum temperature of the coldest month (January) to around 4° C, strong winds in the winter are also felt.

17. Physical features of the catchment area:
Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

As mentioned earlier, Pateira and surrounding areas are built into Cértima River watershed, a tributary of the left bank of the river Agueda, in the area immediately downstream of the lagoon of Pateira and before the confluence of the Agueda with the Vouga river.

River Cértima, with a length of 40 km, corresponding to the last five km to Pateira de Fermentelos, has a catchment area of 545 km^2, with a dendrite type network. The route of Cértima river is almost straight, oriented N-S, parallel to the contact of the Massif Hesperic with the Mesocenozoic formations of the Lusitanica Basin. The bottom of the valley Cértima present in most of its length, an extensive floodplain, often inundated by floods and used by Oliveira do Bairro for growing rice.

Águeda river has a length of 55 km, where the to last 2,5 km are downstream of Cértima confluence, and it as a river basin of 458 km^2, with a dendritic river system also.

The sub-basin of the river Cértima is divided into two parts, the part East of the rougher relief, which develops partially over granites and schist, and the western slope, more flattened, develops on the Mesocenozoic sediment of the Lusitânica. These sediments, mainly due to their detrital composition, often crude and poorly consolidated, are more permeable than the schists and granites, facilitating infiltration and slowing the peak flood in the river Cértima.

In what concerns to Águeda sub-basin, the river extends across most of its area in igneous and metamorphic rocks, which typically low permeability depends on the state of fracturing and alteration of

the massif, thus contributing to a greater volume of runoff, which increases the peak flooding of river Agueda at the point of confluence with the river Cértima, near Pateira. It's important to refer that the Águeda's catchment area is occupied with undifferentiated occupied by forests (76,4%), followed by annual crops (17,7%) and sparse vegetation (2,4%). The urban areas, industry and trade, represent about 1,3%. In relation to the areas occupied by different land uses for the sub-basin of the river Cértima 47,3% is occupied by forests undifferentiated, 26,2% for annual crops and undifferentiated. Urban areas, industries and trade account for 6% of the total. Note also that in this basin occur rice crops (0,6%), important for the delimited area proposal. The data relate to 2005, Corine Land Cover 2000 map. Other occupations in the catchment area are detailed further below.

In what concerns to the main general climate characteristics, the river basin Cértima, a classification of Daveau (1980) *cit.* Almeida (1988), is part of "the maritime type climate region of the Atlantic seaboard," featuring a "thermal atmosphere still very smooth, but with some very hot days or cold-sensitive (...) relatively rainy and characterized by strong and persistent cloudiness (Almeida, 1988). the cumulative monthly rainfall data show that in the period of 74 years analyzed, there are a lot of rain in three months - November, December and January, with cumulative monthly rainfall averages 140-158 mm, in contrast to the months of June, July and August, with average cumulative monthly rainfall values below 40 mm. the peaks of precipitation occur in the months of November and December, where there was rainfall of 480 and 540 mm respectively. Precipitation is the result of air masses from the Atlantic and Mediterranean, but given the orientation of the basin, it is expected that the portion of precipitation that contributes most to runoff is the Atlantic. The basin is classified as a moderately wet region, with an average annual rainfall between 1000-1500 mm, with more than 70% of the total annual rainfall falling between October and April. Summers are mild type, with an average maximum temperature of the warmest month (August) of about 28° C. The winters are kind of cool with average minimum temperature of the coldest month (January) to around 4° C, strong winds in the winter are also felt.

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18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

This wetland has a major role in groundwater recharge as well as in flood control. Also represents an important role in sediment trapping, namely in what concerns the fertilization of agriculture fields due to the flooding events that, in this area, occur periodically every year as a result of the amount of water that these rivers transport, in particularly during winter season. The lowland areas of Águeda and Cértima floodplains are sinks for sediment, organic matter and nutrients during flooding. Due to the alluvial terraces, these areas are very important for agriculture as they are the most fertile in the area.

During summer season represents an important role in maintaining the water supply to both natural and human-made ecosystems. The lagoon of Pateira de Fermentelos occurs in a flat area at the end of Cértima basin, where sediment trapping is favourable. On the west side of this lagoon, the Aveiro Cretaceous groundwater body crops out and has a phreatic to semi-confined behavior. These cretaceous outcrops belong to the recharge area of this important groundwater body.

Also to refer the filtering ability of the area, namely the lagoon and wetland ecosystems, important to preserve the water quality by removing nitrogen, phosphorus and others chemical compounds from agricultural and urban runoff.

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19. Wetland Types

a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

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)

b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

3, Tp, 4, O, Ts, M

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20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The wet area encompasses open water and flooded vegetation in the embankments and water lines, this complex mosaic is dominated by settlements of reed (*Phragmites communis*), together with bulrush (*Typha* sp.) and zebra rush (*Scirpus lacustris*). These areas are extremely important to the ecological services provided to the animal communities present as they supply refuge, feeding, breeding areas and shelter namely to bird species. On the other hand there are all the ecosystem services, hydrological and water quality services important to the permanence of the biotic communities.

Therefore, the diversity of biotopes existing in the region (reedbeds, rice fields, embankments with aquatic vegetation, etc.) transforms it into a rich ecosystem and, therefore, in an important refuge for wild life. The heterogeneous mosaic of landscapes, as well as water availability, that occur within the wetland creates conditions for the establishment of communities and unique ecological successions, essential to the balance of the wetland and ecosystems service. As an example it can be referred to the "Bocage" landscape, shaped by hedgerows, some trees and shrubs were the density but also diversity and their

relations in space, maintained by the diversity of agricultural practices, contributes to biodiversity as it provides a diversity of ecological niches which encourages biodiversity in landscapes (e.g. by hosting or feeding different animal species). The biophysical conditions also allow the diversity of fish species found at the Pateira, Cértima and Águeda river.

Further ecosystem services of the site and the benefits derived can be listed: education and science, soil formation, water supply and wood, spiritual and historical information, pasture for livestock, information aesthetics (landscape), prevention of catastrophic events, production of food, refuge for biodiversity, climate regulation, sequestration of CO_2, regulation the water cycle and nutrient, among others.

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14, Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

In several areas we can witness the existence of arboreal and bush-like species, such as: Weeping willow (*Salix alba*, *Salix* sp.), poplar (*Populus canescens*, *Populus nigra*, *Populus* sp.), Black alder (*Alnus glutinosa*), Glossy buckthorn (*Frangula alnus*), Narrow-leafed ash (*Fraxinus angustifolia*), Common hawthorn (Crataegus monogyna), Back elderberry (*Sambucus nigra*), Grey willow (*Salix atrocinerea*), occasionally oak trees (*Quercus robur*), *Laurus nobilis*, *Ulmus* sp..

From the group of herbaceous and sub-arbustive species we will simply refer the presence of Yellow iris or Yellow flag (*Iris pseudacorus*), Watercress (*Nasturtium officinale*), hemlock water or dropwort (*Oenanthe crocata*), Spotted ladysthumb (*Polygonum persicaria*), Water mint (*Mentha aquatica*), among many other. Species with protection status also occur, such as the Butcher's broom (*Ruscus aculeatus*) under Annex V.

Peculiar, and little known, is the fact that, in areas close to the lake, there are carnivorous plants such as the pale butterwort (*Pinguicula lusitanica*); there could potentially exist other species, though they have become more difficult to find.

Despite the natural habitats types of Community Interest whose conservation requires the designation of special areas of conservation mentioned in section 20. It's important to refer Habitat 91E0* "Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)", priority habitat type that occur in the area distinct or associated with others habitats.

Despite the species referred before, there are also communities (or mixed areas) of vascular plants with aquatic machrophytes, rooted or suspended between the bottom and the surface such as the Water-lily (*Nymphaea* sp., *Nuphar luteo*).

Among the alloctone species one can find Water milfoil (*Myriophyllum* sp.) or even the Water-hyacinth (*Eichhornia crassipes*). *Eucalyptus globulus* is predominant in the forest cover throughout the environs of the

lake, and other trees of the genus Acacia and Hakea, which are scattered close to the lake and present an invasive behaviour.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Nationally rare or internationally rare or interesting species occur in the area. Migratory birds, especially waders at autumn migration, but also staging grebes and ducks are quite abundant such as (*Anas acuta, Anas clypeata, Anas crecca, Anas penelope, Anas platyrhynchos*) no count data available, just nesting and occurrence information.

In annex I of present appliance are listed most of the species observed and studied in the wetland. However, further details are given about some of the most unique (and rare) species that occur at Pateira de Fermentelos. All of those species are included in Annex I of Birds Directive (Directive 79/409/CEE):

Little Bittern (*Ixobrychus minutus*) is a migratory threatened bird that breeds in the area. This small wading bird in the heron family is frequently found in areas of abundant reedbed vegetation, making it difficult to see. It doesn't need extensive areas for nesting, being an essentially lonely species during the breeding season. It nests in the middle of reeds in shrubs, above the water level. It feeds on insects, and sometimes small fish, amphibians, molluscs, crustaceans, eggs and other birds' chicks, among other.

Purple Heron (*Ardea purpurea*), is a migratory threatened bird that breeds in the area. Observations completed in the last few years indicate the population of the Purple Heron has been rising in the Pateira, as it represents one of the largest communities in Portugal. Several juvenile are observed in the agriculture fields and flying over the pond during the reproductive season. Frequently the breeder population at Pateira reaches 40 to 50 pairs. It prefers wetlands with dense reedbed vegetation areas, while searching for nutrient-rich (eutrophic) waters which are shallow and with little or no current. The nests are made close or near the water, generally amongst flooded reed-plots, nevertheless nests from previous years are not used again. It feeds mostly on fish and insects (larvae and adults).

Marsh Harrier (*Circus aeruginosus*) is a threatened species that is present at Pateira all the year. At Portugal 70-75 pairs were estimated in 1998. At Pateira there are 3-4 pairs (2006 data) that breeds in the reedbeds. It nests in wetlands where abundant tall straight firm-stemmed grasses occur, preferably platforms of reedbed, a couple has been observed in a suitable habitat for nesting. Several birds observed searching for food in the area in low water with aquatic vegetation, being frequently seen hunting in the agriculture fields nearby close by.

Black Kite (*Milvus migrans*) a couple has been observed in a suitable habitat for nesting. The black kite is found in diverse types of habitat, even though it appears to be associated mainly to the water body. It searches for prey in open or semi-open areas, feeding on small prey, such as, rodents, lagomorphs, birds and hedgehogs, especially juveniles, sick or wounded animals, but also reptiles, fish, amphibians and insects.

There are other species included in the Annex I of Council Directive 79/409/CEE such as the Black-winged stilt (*Himantopus himantopus*), where more than three males singing simultaneously is suitable habitat for nesting, and more than 30 birds have been observed in silted areas of the lagoon. An growing population of Common kingfisher (*Alcedo athis*) occurs in the area, as more birds are observed year after year. As in previous case, more than three males singing simultaneously in suitable habitat for nesting where heard. The occurrence of other species is listed in Annex I.

These and other species occur in the Special Protection Area of the Ria de Aveiro, making the Pateira, part of the system which "supports, regularly, more than 1% of the biogeographic population of Pied avocet (*Recurvirostra avosetta*), of Common scoter (*Melanitta nigra*), Ringed plover (*Charadrius hiaticula*) and Kentish plover (*Charadrius alexandrinus*)" (ICN, 2006).

Mammals

The European Otter (*Lutra lutra*) stands out because is protected under the Annexes II and IV of the Decree-law n. º 49/2005, of 24 February. The animals breed in the area been quite selective about their rest and shelter locations, therefore making it possible to find their refuge at the most quiet embankments where vegetation abounds. This species feeds mostly on fish, but it can also have amphibians and crustaceans (such as the Louisiana-crayfish). It can mate anytime during the year, depending on the abundance of food resources, and the cubs (up to 4) are born 61-63 days after in a hole disguised by the vegetation.

Species such as the Hedgehog (*Erinaceus europaeus*), the Fox (*Vulpes vulpes*), the Wild-rabbit (*Oryctolagus cuniculus*), the Wild boar (*Sus scrofa*), and several rodents, among other species, find protection under European and National Law and can be found within the site.

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23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

The local population has a long history of activities connected to the lagoon and surrounded areas, as there are historic records that document activities in the XVth century. Morais in Sousa Baptista (1945) also quotes from of a letter of the royal treasurer of Aveiro to King D. Manuel I (ruled from 1495 to 1521) where he discusses about the Forest of Perrães (probably between Perrães and the front of the Fermentelos civil parish), saying that this had always been hunting-grounds where wild-hogs (probably boars) and deer were game, also mentioning that it was marshy.

It's unquestionable the value of the area to the local populations not only for the historic importance already mentioned, but also because the goods that the population took and take from the lagoon and surrounding areas: water supply, food, religious, aesthetic values and, in a recent past, the tradition of harvesting freshwater seaweeds from the lagoon to use in the contiguous agricultural fields as fertilizers, nowadays this tradition is been recovered but just for recreational and tourist purposes and to pass on to the recent generations one of the most ancient and typical activity that took place in the area.

Several activities still occur nowadays in the area, namely non-consumptive recreation as people are also engaged in traditional fishing practices with good history of respect for nature, as sport/recreational fishing has gained wide acceptance at the expense of professional fishing. Within the wetland and surrounding areas the cultivation of cereals represent the main agriculture activity: rice fields along the river Cértima and maize in the Águeda floodplain. Other aspect quite representative of the social and cultural value of the area to the local population is related to sport. Daily the local canoeing team trains in the lagoon and from this area has already gone out national champions and Olympic athletes.

Tourism is not well developed at this point, but has good perspective in future, namely the activities related with sustainable tourism namely hiking, bird-watching, among others. The Municipality Authority of Águeda promotes several activities of environmental education/interpretation, as well as some activities and events to promote the scientific research, and the communication between the scientific communities and local population. With regard to the archaeological component is worth mentioning that some studies indicate that the ancient village of Gocha has occurred in this area.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

No data known.

If Yes, tick the box ❑ and describe this importance under one or more of the following categories:

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

a) within the Ramsar site:

Mainly private ownership, some areas belong to the State, others despite been private areas are public domain.

b) in the surrounding area:

Mainly private ownership, some areas belong to the State, others despite been private areas are public domain.

25. Current land (including water) use:

a) within the Ramsar site:

The current land use within the Ramsar site is characterised by water plan, rainfed annual crop, rice fields, annual and undifferentiated crops, undifferentiated forests, natural pasture, sparse vegetation and marsh. A small urban area is included. See also point 23.

b) in the surroundings/catchment:

According to Corine Land Cover 2000 map (2006):

	Águeda River		**Cértima River**	
Land Use	**Area (km²)**	**Area (%)**	**Area (Km²)**	**Area (%)**
Annual and undifferentiated crops	80,99	17,7	142,74	26,2
Undifferentiated forests	349,79	76,4	257,88	47,3
Urban	2,11	0,5	20,17	3,7
Industry and commerce	3,86	0,8	12,79	2,3
Rainfed annual crop	0,89	0,2	11,33	2,1
Annual crop irrigation	4,58	1,0	4,34	0,8
Natural pasture	4,68	1,0	4,68	0,9
Sparse vegetation	11,08	2,4	11,08	2,0
Mining	-	-	0,01	0,002
Rice field	-	-	3,49	0,6

Vineyard	-	-	69,93	12,8
Olive	-	-	1,77	0,3
Marsh	-	-	3,22	0,6
Water plan	-	-	1,97	0,4

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

a) within the Ramsar site:

Several studies document the factors that might produce some effects in the site's, namely those adverse to the equilibrium of the area. The largest threat factors that are documented are essentially intensive farming and cattle raising (in-site), contamination of water and soils by both urban and industrial effluents and the occupation by urban infrastructure and industrial. The lagoon also suffers from a serious risk of sedimentation / siltation, as a natural process that occur in all lagoons. The introduction (in site) in the past of invasive alien species of exotic fauna and flora as created, a few years ago, one of the largest impacts in the lagoon ecosystem as almost 50% of the water surface was covered by water – hyacinth mats. Despite the water-hyacinth invasion is at the present time under control as a result of a management plan to remove and control the invasion, other species may threat the ecosystem (*Azolla* sp.). Fishing and hunting (in site) are also allowed in some areas of the site and represent, namely hunting, a major threat to the ecological conditions needed to support some of the species that occur, namely those with special conservation needs and protected status. Forestry interventions (in site and off-site) as well as the abandon of traditional agriculture practices (in site) might put in danger some ecosystems related and classified habitats.

b) in the surrounding area:

The largest threat factors might be the intensive farming, contamination of water and soils by both urban and industrial effluents and the occupation by urban infrastructure and industrial, in the surrounding areas. The absence of a dam on river Águeda, downstream of Pateira, together with silting of the same, can compromise the ecological flow available in the lagoon and surrounding areas.

27. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

The site is part of the Special Protection Area of the Ria de Aveiro (PTZPE0004), Birds Directive protection. The area is also classified as a "Sensitive Area" according to the Decree-Law n.º 152/97, of 19 July, Annex II.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ❑;Ib ❑; II ❑; III ❑; IV ❑; V ❑; VI ❑

c) Does an officially approved management plan exist; and is it being implemented?

The Municipality of Águeda is implementing the Development Plan for Pateira of Fermentelos, which provides a set of strategies and actions aiming at the sustainable development of the area. Some of those actions include the protection and maintenance of biological diversity, control of exotic species, renaturalization of some areas with the introduction autochthonous species, promotion of scientific research in the area, sustainable agriculture practices, among others. This management strategy is already being implemented.

d) Describe any other current management practices:

Currently we are continuing the water-hyacinth control and, concerning this matter, a protocol was developed between the Centre River Basin Administration (ARHCentro) and the parish councils bordering the lagoon, so that they carry out the removal of the water hyacinth plants as they emerge, preventing their proliferation, as well as those that occur shortly in areas of difficult access to the aquatic harvester. Other practices can be listed: hunting will be forbidden soon, we are promoting a sustainable tourism plan for the area, implementation of pedestrian trails, developing sustainable education activities, bird-watching, among other initiatives. A web-site was also created in order to give more information about the area, and promotion of activities that take place, promote public awareness, etc.: *In*: www.cm-agueda.pt/pateira.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

Some of the measures that are not yet implemented correspond to:

- the creation of a official Regional Protected Landscape - The aim is to classify the status area of protected landscape, update the management plan for the site;
- open the range and intervention to remove and control weed species - as well as continuing the removal of water-hyacinth, we intend to act in eradicating surrounding the occurrence of Haque and Pampas Grass;
- start interventions in order to reestablish natural flora, removed from some areas, by introducing native species - native species planting has occurred in areas where the removal of forest cover / original riparian;

- implementation of some bird-watching structures;
- construction of an Centre for Biodiversity and Environment interpretation;
- promote a common project that involves local stakeholders and centers of ID&T;
- develop several partnerships with other national and international wetlands in order to promote a more sustainable development of the area;
- Other.

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29. Current scientific research and facilities:
e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Several scientific studies have been developed in site, namely by the University of Aveiro. Nonetheless, others are under development in the site, especially with regard to the themes of hydrogeology, sedimentology, ecology and botany, as others that have been developed during the past decades (as presented in chapter 34.). The water quality of the lagoon as received special interest by researchers (e.g. Almeida, 2006) as an example Ferreira (2007) presented a MsC degree dissertation which had as a principal aim the hydrochemistry and water quality characterization of the Cértima river basin (Portugal), using physical and chemical data. A total of twenty nine sampling sites were selected in the Cértima River basin based on accessibility and representative distribution of the potential pollution sources and different types of geology outcropping in this area. Temperature, pH, electrical conductivity (EC), redox potential (Eh), total dissolved solids (TDS), total alkalinity and dissolved oxygen (DO) were determined *in situ*. Water samples were collected for determination of total suspended solids (TSS), biochemical oxygen demand (BOD5), Kjeldahl and ammonium nitrogen contents, major, minor and trace elements, as well as total organic carbon (TOC), fluoride, chloride, bromide, nitrite, nitrate, phosphate and sulphate analyses. Other studies are been developed, been the more recent promoted by the University of Beira Interior.
Recent studies have focused on the quality of the lake sediments, comparing the geological nature of the same in different parts of the site, also evaluating its physical and chemical quality. Some scientific research projects about fauna and flora of the area are also under progress, as well as other educational projects, promoted by local schools and university.

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30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:
e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

There are several activities promoted and developed in the site and nearby areas, allowing contact with nature and the dynamics of the local cultural traditions. Some of the activities that occur are actions for environmental education and public awareness, nest building, bird-watching, interpretative trails, lectures and activities for environmental preservation, visits along marked trails with a specialized guide, thematic workshops among others. Also a Scientific meeting was organized and open to the public, to bring together the largest number of scientific studies conducted over the area, presenting them to the population but also to other researchers. There are other activities promoted by the Municipal Authority of Águeda or other entities, such as SPEA (Sociedade Portuguesa para o Estudo das Aves/Portuguese Society for the Study of Birds), University of Aveiro, Quercus (Associação Nacional de Conservação da Natureza/National Association for Nature Conservation) and others.

Currently it is available to all stakeholders through the web page Pateira (e.g. http://www.cm-agueda.pt/pateira), different information on different themes, activities and interventions that result in the area and adjacent areas. The site also has a channel of communication with the public through which the municipality will be able to discuss ideas, suggestions and complaints, among others.

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31. Current recreation and tourism:
State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

The site is used frequently for recreation/tourism activities, not very intense. Along some areas of the site in the Municipalities of Águeda, Oliveira do Bairro and Aveiro, there are different structures that support the visitation and the tourist activities that take place such as leisure parks, avifauna observatories, pedestrian and cycling trails, children's playgrounds, landscape observatories, places to rest, support facilities for the practice of sports. The interest for the area has been rising over the past years.

The marked hiking trails and bike implemented are searched for an increasing number of visitors (in two month's more than 2000 people register. Is estimated that many more as visited the area). There are more visitors in the summer; however it's well used throughout the year by walkers and bird watchers.

These activities are mostly well regulated and signed and at current levels are not considered to threaten the site natural values.

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32. Jurisdiction:
Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

Municipal Authority of Águeda

Municipal Authority of Aveiro

Municipal Authority of Oliveira do Bairro

Portuguese Ministry of Agriculture, Marine, Environment and Territorial Planning (Institute for Nature Conservation and Biodiversity | Instituto de Conservação da Natureza e Biodiversidade; National Water Institute | Instituto da Água; Administração da Região Hidrográfica do Centro | Centre River Basin Administration; National Forest Authority | Autoridade Florestal Nacional; Centro Regional Coordination and Development Commission | Comissão de Coordenação e Desenvolvimento Regional do Centro; Centre Regional Directorate of Agriculture and Fisheries | Direcção Regional de Agricultura e Pescas do Centro)

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33. Management authority:
Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

The site is managed by several entities but since 2006 the Municipal Authority of Águeda leads the process of rehabilitation and conservation of the wetland, co-working with others municipal authorities. All contacts should be made through:

Câmara Municipal de Águeda, Praça do Município, 3754 – 500 Águeda, PORTUGAL

a/c Célia Laranjeira
celia.laranjeira@cm-agueda.pt
+351 234610070 (ext.427) or +351 962193254

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34. Bibliographical references:
Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

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