Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note 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. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Bureau. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

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

FOR OFFICE USE ONLY.

DD MM YY

Designation date | Site Reference Number

Parque Natural da Serra da Estrela
Rua 1ª de Maio, 2
6260- 101 Manteigas
E-mail: matosf@icn.pt
In colaboracion with: Jan Jansen

2. Date this sheet was completed/updated:

30/05/2005

3. Country:

Portugal

4. Name of the Ramsar site:

Estrela Mountain upper Plateau and upper Zêzere River

5. Map of site included:

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

a) hard copy (required for inclusion of site in the Ramsar List): yes

b) digital (electronic) format (optional): yes

6. Geographical coordinates (latitude/longitude):

Latitude: From 40º 18' 38" to 40º 23' 16" N
Longitude: From 7º32' 23" to 7º 39' 52" W

Central point : 40º 20' 58"N; 7°36' 36"W

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

The site is located in the highest mountain of continental Portugal, the Estrela Mountain, in the central-east of Portugal.

All the area lies within the limits of a natural park (Estrela Mountain Natural Park) and is under the jurisdiction of three municipalities: Seia, Manteigas and Covilhã. These are included in two districts: Guarda, in the North, and Castelo Branco, in the south.

The site includes the upper part of the mountain, the upper Plateau, including the Candeeira valley and upper part of the Zêzere river valley until the periphery of Manteigas, ending just before a trout nursery. The nearest largest town is Manteigas.

8. Elevation: (average and/or max. & min.)	**9. Area:** (in hectares)
Max 1929 m Min 850 m	5 075 ha

10. Overview:

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

The site is situated at the top of a mountain area, which is in the transition zone of the Temperate and Mediterranean macrobioclimate, in a proper biogeographical sector – Estrellense.

Duo to high precipitation, there are various fresh water environments, such as natural lakes, ponds, swamps, bogs, springs, brooks and rivers. Contiguous to those areas, there are grasslands, basically mat-grass swards (cervunais), various shrublands, rocky environments and little areas of woodlands.

The abiotic quality of the wetland environments is excellent, being mainly nutrient-poor, having very soft waters as a result of the high precipitation (with specific seasonal rhythm) and seepage from granite rocks.

Flora, fauna and vegetation include excellent examples of the endemic taxa and syntaxa, some of which are rare or extremely rare.

11. Ramsar Criteria:

Circle or underline 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).

(1) • (2) • (3) • (4) • 5 • 6 • 7 • 8

12. Justification for the application of each Criterion listed in 11. 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).

Criterion 1: the wetland contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.

The site is located in a proper biogeographical region (estrellense sector), which originality is mainly due to its topography and influence of the Atlantic. In the site there are wetlands that provide habitat to unique plant communities, rare bryophyte communities and rare flora.

Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.

In the site there are many rare and endangered species (fauna and flora). Many occur on national and/or international red lists.
Important plant species in the area: *Festuca henriquesii* (Annex II and IV Habitat Directive, endemic of the Serra da Estrela higher part); *Festuca summilusitana*, *Fescula elegans* and *Narcisus asturiensis* (Annex II and IV Habitats Directive; Endemics of the Iberian Peninsula). There is also the rare bryophyte *Bruchia vogesiaca*, a specie mentioned in annex II of the EU "Habitat Directive". Many other plant that occur here are rare in Portugal and should be considered in a National Red List, but this document does not exist yet (examples: *Gentiana lutea* and *Lycopodium clavatum* (crytically endangered in Portugal); *Senecio pyrenaicus* subsp. *caespitosus*, *Alchemilla transiens*, *Dryopteris expansa*, *Ranunculus abnormis* , *Veratrum album* (vulnerable/endangered)).

In relation to fauna, there are many important species like illustrate the next table (table I)

Table I.. Important fauna in the area

		International Conventions				
CLASS	**Species**	**Bern**	**Habitats**	**Birds**	**Red book**	**Stage of life cycle at the site**
Anphibians	***Salamandra salamandra***	III			LC	STAGING
	Triturus boscai	III			LC	STAGING
	Triturus marmoratus	II	IV		LC	STAGING
	Alytes obstetricans	II	IV		LC	STAGING
	Bufo bufo	III			LC	STAGING
	Bufo calamita	II	IV		LC	STAGING
	Hyla arborea	II	IV		LC	STAGING
	Rana perezi	II	V		LC	STAGING
	Rana iberica	III	IV		LC	STAGING
Reptiles	***Anguis fragilis***	III			LC	STAGING
	Chalcides striatus	II	IV		LC	STAGING
	Lacerta lepida	II			LC	STAGING
	Lacerta monticola	II	II, IV		VU	STAGING
	Lacerta schreiberi	II	II, IV		LC	STAGING
	Podarcis carbonelli	III			VU	STAGING
	Podarcis hispanica	III			LC	STAGING
	Coluber hippocrepis	II	IV		LC	STAGING
	Coronella austriaca	II	IV		VU	STAGING
	Coronella girondica	III			LC	STAGING
	Elaphe scalaris	III			LC	STAGING
	Natrix maura	III			LC	STAGING
	Natrix natrix	III			LC	STAGING
	Vipera latastei	II			VU	STAGING
Birds	***Ciconia nigra***	II		I	VU	BREEDING
	Hieraaetus pennatus	II		I	NT	BREEDING
	Circaetus gallicus	II		I	NT	BREEDING
	Circus pygargus	II		I	EN	BREEDING
	Tachymarptis melba	II			NT	BREEDING
	Alcedo atthis	II		I	LC	STAGING
	Cinclus cinclus	II			LC	STAGING
	Cisticola juncidis	II			LC	STAGING
	Saxicola rubetra	II			VU	BREEDING
	Monticola saxatilis	II			EN	BREEDING
	Luscinia svecica	II		I	LC	BREEDING
Mammals	***Galemis pyrenaicus***	II	II, IV		VU	STAGING
	Sorex granarius	III			DD	STAGING
	Neomys anomalus	III			DD	STAGING
	Myotis blythii	II	II, IV		CR	STAGING
	Miniopterus shreibersii	II	II, IV		VU	STAGING
	Lutra lutra	II	II, IV		LC	STAGING

Criterion 3: The wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.

The site is very important to maintain the biological diversity of the region and even of Portugal. This kind of biotopes is very rare in this country, and some of them are unique.
Portugal recognised the diversity and natural importance of the proposed area in the maintenance the biological diversity of European biogeographic regions, with the area inclusion in the proposed Nature 2000 Site "Serra da Estrela". Here, there are several habitats of community interest (3130, 3260, 4030, 4090, 5120, 6160, 6230*, 6410, 7140, 8130, 8220, 8230, 9580*), some of them priority(*)

Due to the national orography, the wetland mountain biotopes are very rare, and some of them are unique in Serra da Estrela. For example, in some glacier lagoons there are many interesting plant communities, some of them not well study. Here, there are rare communities of *Sparganium angustifolium* (*Sparganio angustifolii-Isoetetum Iereshi*), endemic from the "Cordilheira Central", that in Portugal only exists in a few places of the proposal area. Other important communities of these lagoons are those of *Antinoria agrostidea*, *Ranunculus ololeucus*, *Patamogeton polygonifolius* and *Juncus heterophyllus*. Depending on seasonal wet places, therea are many other communities, like those of *Holcus gayanus* and *Bryum alpinum* (that includes many Iberian endemic species like *Sedum maireanum*, *Scilla ramburei* subsp. *beirana* or *Bryum alpinum*) and those of *Juncus tenageia* subsp. *persusillus*, a little Iberian Peninsula endemic Juncus. In addition, the unique and little population of *Lycopodium clavatum*, which exists in Portugal, depends on the preservation of this area.

In relation to fauna, the area is extremely important to support the populations mentioned in criterion 2, mainly to amphibious and reptiles.

Criterion 4: The wetland supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.

Like all the upper parts of the mountain areas, the site provides refuge for many species and is essencial for the existence of several plant and animal species, that can not grow in any other place of the serounded area. For exemple, the Serra da Estrela endemic plant, *Festuca henriquesii*, depends on this area, particulary on the humid places were snow stays for a longer time.

The generality of amphibious and mammals present, depends on this area to staging. The important bird spicies present, use this area to breeding and/or staging (see table I)

13. 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:

The site is located on the Estrellense sector (Kingdom: Holártico; Region: Mediterranean; Sub province: Carpetan-Leonesian), according to the Biogeography of Continental Portugal from Costa *et al.* (1999).

b) biogeographic regionalisation scheme (include reference citation):

In terms of the biogeographic regionalisation scheme of the Habitats Directive/Natura 2000 Network, the area is situeted in the Mediterranean.
In the terms of the Biogeographic of the Iberian Peninsula the area is situeted in Estrelense region (figure 1).

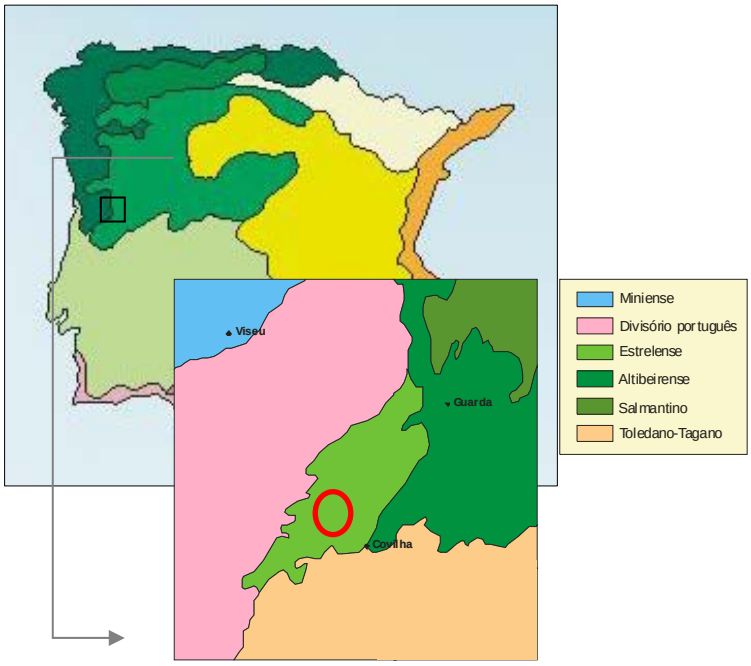

Figure 1. Biogeography of the Iberian Peninsula and Biogeographic Sectors of the surrounding area.
(Based on Mapa Biogeográfico da Europa (Rivas-Martínez *et al.*, 1999) and Mapa Biogeográfico de Portugal (Costa *et al.*, 1999)).

The site location is represented with a red circle.

14. 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.

The sit holds by far the summit (1993 m) of continental Portugal.

In the course, all the area has been folded and uplifted and subsequently worm down and dissected by different forms of erosion. Many geomorphologic structures (including lakes) are of glacial and periglacial origin.

The origins of the site are not dissociable with the origins of the Estrela Mountain, and of all the Central Range. All the area underwent a mountain-forming process generally know as the Hercynian orogeny. After a long period of erosion it was more or less levelled to a plain, and from it, a major part of the Meseta evolved. Some 70-90 million years ago, the Eurasian and African plate got close, starting a compressive general regime period for the whole Iberian micro-plate. The alpine compressions induced also the reactivation of the Estrela Mountain resulting in a huge vertical dislocation up to some 1 500 m.

Glacial and periglacial processes during the Quaternary (period of the last 2.5 milion years) made a strong contribution to the present day morphology of the higher parts of the mountain. The highest plateau area of the Estrela, the upper Plateau, was covered by an ice cap and from it seven major glacier lobes diverged towards the lower parts. Roughly 25 000 years ago the Zêzere lobe outreached the present village of Manteigas. With some 13 km it was the longest glacier lobe.

The climate varies with the elevation, between 2 different macrobioclimats: The Temperate, characteristic of the Central and North of Europe, and the Mediterranean proper of the South of Europe.

As a result of the high precipitation in the Estrela Mountain, various fresh water environments exist. According to their stream velocity these may be subdivided into standing waters such as lakes, ponds swamps or bogs, and running waters such as springs, brooks and rivers. Other factors influencing aquatic flora and fauna include nutrient availability (oligotrophic, mesotrophic, eutrophic), nature of substratum (sand, silt, clay, rock), temperature, light availability, water depth, duration of inundation, acidity, oxygen availability, and other factors, some of which are also interrelated to each other. The substratum mainly consists of granites.

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Together with the Açor (1349 m) and Lousã (1202 m) Mountains, the Estrela Mountain constitutes the western part of the Central Range. This range stretches some 500 km over the Iberian Peninsula in a East-West direction, dividing the major Atlantic drainage system in the northern Meseta (Douro Basin) and the southern Meseta (Tagus Basin).

In the North-eastern part of the massif the drainage of three major catchments basins coincide: of the Douro, the biggest river of the Peninsula; of the Tagus, the longest river of the Peninsula; and of the Mondego, the biggest river that has its offspring in Portugal.

The mountain consists mainly of granite rock in the central part and schists in its periphery. Due to erosion, soils are often shallow or even absent, especially on slopes. Depletion of materials takes place in convex areas and accumulation takes place in all kinds of depressions. The origin of the area was described in the previous point (point 14). Major soil-types of the mountain include lithosoils, rankers, cambisols and fluviosols.

16. Hydrological values:

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

The area has a large water storage capacity hosting numerous springs with soft and crystal-clear waters. It is no surprise that in this modern times with so much pollution the precious waters from the Estrela Mountain became more and more famous. Most of the springs can be found around the valleys. Tectonic movements probably during the alpine reactivation produced the so-called Manteigas-Bragança fracture.

Near to the mountain summit three majestic peaks are grouped. They are called the "Cântaros" (English: jars), because they supply water the whole year round. It is in the cirque between the "Cântaro magro" (The slim jar) and the "Cântaro gordo" (The fat jar) that the river Zêzere found its offspring. In its catchment area and those of other rivers (Mondego, Alva, etc.), springs contribute to the major part of their discharge in summer.

The Zêzere delivers a major part of the drinking-water for the national capital, Lisboa.

17. 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• Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c) Note: only small areas.

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.

U.Non-forested peat lands including shrub, open bogs, etc.;
TS. Seasonal pools;
Va. Alpine wetlands;
N. Intermittent streams;

Tp. Permanent pools;
Y. Fresh water springs;
M. Permanent rivers;
Xf. Fresh-water tree-dominated;
2 - Ponds;
4. Seasonally flooded agricultural land;
6. Barrage

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

The special characteristic of the site is the existence of several wetland types in a particular climate and biogeography, which is propitious for the existence of particular communities.

Here there are springs with interesting plant species, specially important to bryophytes, many of them included in the red list of the Iberian Peninsula. There are rivulets with rare bryophyte communities like *Fontinaletum antipyreticae* Kraiser 1926, *Fontinali antipyreticae-Ranunculetum ololeuci* (lusitanici) Br.-Bl., P. Silva, Rozeira e Fontes 1952 em. Jansen 1999 subass. *fontinaletosum antipyreticae* Jansen 1999 in Jansen & Sequeira, 1999. At the banks it may be found the rare bryophyte *Bruchia vogesiaca*, a species mentioned in annex II of the EU "Habitat Directive".

There are former glacial lakes, with very low conductivity (mostly < 20 μS). These lakes support floating vegetation with an Iberian endemic and arctic–alpine relict species described as BC *Sparaganium angustifolium* – [*Littorellion*] Jansen 1999 and *Fontinali antipyreticae-Ranunculetum ololeuci* (*lusitanici*) Br.-Bl., P. Silva, Rozeira & Fontes 1952 em. Jansen 1999 subass. *antinorietosum agrostideae* Jansen 1999 in Jansen & Sequeira, 1999.

So far bogs have not been studied well.

A major part of these communities occur in a gradient from humid vegetation (e.g. heathlands, mat-grass swards) to wet vegetation (lakes, rivulets, springs). They include highest diversity of Portugal's *Sphagnum* species and some of them have their only occurrence here. A first estimate of the compiler indicates that vegetation may be assigned to the *Junco squarrosi-Sphagnetum compacti* Br. Bl., P. Silva, Rozeira & Fontes 1952. The *Caricetum carpetanae* Rivas-Matínez 1963 may be observed occasionally. Other associations may occur only sporadically like *Calluno vulgaris-Sphagnetum capillifolii* Prieto, Ordóñez & Collado 1987, *Sphagno compacti-Trichophoretum germanici* (Oberdorfer 1938) Bartsch 1940 em. Dierssen 1975, and *Ericetum tetralicis* (Allorge 1922) Jonas 1932, and *Menyanthes trifoliata*-coenon.

Fauna is also very rich in the area, particularly in amphibious and reptiles (9 amphibious and 14 reptiles mentioned in International Conventions), same of them with enormous conservation value, like *Lacerta monticola*, *Lacerta schreiberii*, *Triturus boscai* or *Rana iberica.*

In addition, a number of arthropods and other fauna may occur. These have not hardly been studied.

19. Noteworthy flora:

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. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Due to the presence of a transition from Euro-Siberian to Mediterranean vegetation, many species from Euro-Siberian region reach their south-western limit here.

Many species are rare, endangered and occur on national or international red lists. A large number of Iberian endemics occur. For further information see 18.

20. 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.*

Actually there is no fish in the lagoons. In the proposed there are 9 amphibious and 14 reptiles, mentioned in International Conventions, same of them with enormous conservation value, like *Lacerta monticola*, *Lacerta schreiberii*, *Triturus boscai* and *Rana iberica*. Special importance is given to *Lacerda monticola monticola*, a national endemic amphibious, with high density, but a very restrict distribution area (only in the upper part of Serra da Estrela). The bird communities that depend on national high mountain habitats are in small number, and this place is not a exception. Although, between this few species there are same of high conservation status in national and/or international terms (*Ciconia nigra*, *Hieraaetus pennatus*, *Circaetus pennatus*, *Circus pygargus*, *Alcedo atthis* and *Luscinia svecica*) and endangered or vulnerable species (*Ciconia nigra*, *Circus pygargus*, *Saxicola rubetra* and *Monticola saxatilis*). The mammal communities that depends on this wetlands are in small number. Although the presence of important species like *Galymis pyrenaicus* or *Lutra lutra.*

The most important information about this species is in table I.

21. Social and 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.

Highest mountain of Portugal.
The area is important to the agro-pastoral system, a tradiocional activity of the area.

22. Land tenure/ownership:

(a) within the Ramsar site:
Part of the land is private property and the other part is community property.

(b) in the surrounding area:
The great part of the land is private property.

23. Current land (including water) use:

(a) within the Ramsar site:
Mainly Summer grazing and Summer/Winter tourism. Also agriculture and foresty.

(b) in the surroundings/catchment:
Summer grazing, Summer/Winter tourism, agriculture and foresty.

24. 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:
Lack of grazing arrangement during the warmest period, when the Mediterranean influence is most strong , take to a overgrazing situation in same humid sites, extration and use of water for electricity production, swimming in the lakes causing disturbance and pollution significant for the species in presence, uncontrolled rubbish dumps (especially plastics used as vehicle by "ski-tourists" in winter blocking rivulets and choking small habitats sucha as bogs and springs), tourists are leaving rubbish (e.g. after pick-nic) which is harmful specially in bogs, rivulets and lakes, discharge gutters made of concrete in a granitic nutrient-poor environment, strong gritting in winter on the roads raising the conductivity of the waters.

(b) in the surrounding area:
More or less the same as in a).

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

A large part of the proposed site has the status of Biogenetic Reserve and is part of the European Network of Biogenetic Reserves, approved by the Council of Europe (CDPE 1993).

All the area its included in the Estrela Mountain Natural Park and has been integrated in a Natura 2000 site (Site Estrela Mountain).

26. Conservation measures proposed but not yet implemented:

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

A management plan is in preparation by the ICN (Institute for Nature Conservation) for the Biogenetic Reserve.
Main actions to be taken according to Jansen (1997, Nature 2000 report):
- Restore climax forests by designation of areas with undisturbed sucession;
- Start pilot projects for sustainable forestry;
- Support traditional land use, organic farming, ecotourism, etc. (grazing keeps part of the vegetation open that is beneficial to certain vegetation of aquatic environments; organic farming also triggers the traditional system and is alternative to bioindustrial farming causing pollution and eutrophication, ecotourism benefits rural economy and will not harm suitability of the system if number of tourists will not grow to extremely high figures);
- Conserve excellent and good Nature 2000 habitats, restore degraded habitats;
- Make a comprehensive study of all habitats and interesting species;
- Intensify education (a.o. create a visitors center(s), write popular books for the layman);
- Direct the increasing number of visitors in the right way;
- Prevent the increasing water extraction;
- Fight the fire problem;
- Stay on speaking terms with landowners and all interesting parties concerned;
- Make a management plan, with an eye for all the forementioned actions threats vulnerability.

27. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

LIFE-NATURE programme in course to recover Natura 2000 priority habitas.

28. Current conservation education:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

There are several offices of the park that can be visited. However, their presence is not obvious at all and it is very hard to find them. Offices are not well equipped and personal is not sufficiently trained to support the present demands.

The park has edited a number of publications. Some have excellent quality, like; 1) Map for tourism in the Estrela Mountain Natural Park, at 1:50 000 ; 2) Discovering the region of Estrela Mountain, network of major walking routes, also in Portuguese; 3) Estrela Mountain geologic and geomorphologic guide, including a map of the nature park at 1:75 000; 4) Geobotanic guide of the Estrela Mountain Natural Park.

29. Current recreation and tourism:

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

People go to this place for recreation, mainly to have fun with snow. In summer, they also swin in the lakes. The off-road motors, jeeps, damaging bogs and rivulets, are also see.

30. Jurisdiction:

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

Estrela Mountain Natural Park – Institute for Nature Conservation.

31. 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.

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e-mail: pnse.matosa@icn.pt

32. Bibliographical references: scientific/technical references only. If biogeographic regionalisation scheme applied (see 13 above), list full reference citation for the scheme.

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