

Strasbourg 20 January 1986

SN-ZP (86) 22

EUROPEAN COMMITTEE FOR THE CONSERVATION OF NATURE AND NATURAL RESOURCES



Committee of Experts on Protected Areas

ORDESA AND MONTE PERDIDO NATIONAL PARK

Application for the European Diploma submitted by Spain

7.229 09.3

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CONTENTS

- 2 -

			Page
1.	Туре	of natural area, site or feature	5
2.	Chara	acteristics of Ordesa and Monte Perdido National Park	5
	2.1	Legal characteristics	5
		2.1.1 The original park	5
		2.1.2 Reclassification	5
	2.2	Physical and natural characteristics	6
		2.2.1 Topography	6
		2.2.2 Lithology and stratigraphy	6
		2.2.3 Geology and geomorphology	6
		2.2.4 Pedology	7
		2.2.5 Climatology	7
		2.2.6 Hydrology	7
		2.2.7 Vegetation	7
		2.2.8 Fauna	7
	2.3	Human characteristics	7
		2.3.1 Ownership	7 .
		2.3.2 Traditional activities	.8
		2.3.3 Current activities	8
		2.3.4 Access	8
		2.3.5 Facilities	8
		2.3.5.1 Car parking	8
		2.3.5.2 Wardens' lodge	8
		2.3.5.3 Restaurant	. 8
		2.3.5.4 Parador Nacional de Turismo	. 8

			Page
		2.3.5.5 Visitors' centre	8
		2.3.5.6 Small refuges	9
		2.3.5.7 Miradors (observation points)	9
		2.3.5.8 Staff	9
	2.4	Extension of Ordesa Valley National Park to become Ordesa and Monte Perdido National Park	9
		2.4.1 Physical aspects	9
		2.4.2 Human aspects	10
3.	Euro	pean interest justifying the application	10
4.	-	raphical description and boundaries of Ordesa and Monte ido National Park	11
	4.1	Ordesa Valley National Park	12
	4.2	Ordesa and Monte Perdido National Park	12
5.		utory protection for Ordesa and Monte Perdido	12
	5.1	Past and present measures	12
		5.1.1 National Parks Act of 7 December 1916	12
		5.1.2 Royal Decree establishing Ordesa Valley National Park, 16 August 1918	12
	. •	5.1.3 Ministerial Order for a public inquiry into the extension of Ordesa Valley National Park, Ministry of Agriculture, 31 October 1974	12
		5.1.4 Protected Natural Landscapes Act, 2 May 1975	12
		5.1.5 Royal Decree approving the implementing regulation for the Protected Natural Landscapes Act (Law No. 15 of 2 May 1975), 4 March 1977	
		5.1.6 Ordesa and Monte Perdido National Park (Reclassification and Extension) Bill, 20 October 1981	12
		5.1.7 Ordesa and Monte Perdido National Park (Reclassification and Extension) Act (Law No. 52 of 13 July 1982)	12
	5.2	Summary of the Ordesa and Monte Perdido National Park (Reclassification and Extension) Act (Law No. 52 of 13 July 1982)	12

725

6.		of works relating directly or indirectly d Monte Perdido National Park	15
7.	Appendix I	Vegetation of Ordesa and Monte Perdido National Park	21
8.	Appendix II	Fauna of Ordesa and Monte Perdido National Park	23
9.	Appendix III	Legislation (texts available at the Secretariat)	

Page

REPORT SUPPORTING THE APPLICATION FOR THE EUROPEAN DIPLOMA FOR ORDESA AND MONTE PERDIDO NATIONAL PARK

Name: Parque Nacional de Ordesa y Monte Perdido

Name and address of the body responsible for its management:

National Nature Conservation Institute (ICONA) Huesca Provincial Division General Lasheras 8 Huesca (Spain)

Country: Spain

1. TYPE OF NATURAL AREA, SITE OR FEATURE

The Ordesa and Monte Perdido National Park is the representative in Spain of central Pyrenean mountain ecosystems on calcareous soils. It covers the Monte Perdido, Europe's highest calcareous massif, and the high mountain valleys descending therefrom: Ordesa Valley (a national park since 1916), the Añisclo and Escuain valleys and the Pineta cirque.

The park contains a variety of ecosystems commensurate with its surface area (15,608 ha) and great differences in altitude. There are also large numbers of threatened plant and animal species and endemic Pyrenean species of great ecological value.

The park is of great value as a landscape because of the diversity and quality of the habitats found there, ranging from green, high-mountain grassland to shady forests and calcareous expanses which, owing to extremes of climate, are devoid of vegetation.

This report gives a brief summary of the national park's natural and human characteristics. Greater emphasis is placed on the Ordesa Valley, since the rest of the area, although in an excellent state of conservation through having scarcely been exploited, was incorporated in the national park much more recently.

2. CHARACTERISTICS OF ORDESA AND MONTE PERDIDO NATIONAL PARK

2.1 Legal characteristics

2.1.1 The original park

Ordesa Valley National Park was established by a Royal Decree of 16 August 1918 (see Appendix III) declaring the valley of the river Arazas, excluding its source, to be a national park.

2.1.2 Reclassification (Maps 3 and 4)

Pursuant to the Protected Natural Landscapes Act (Law No. 15 of 2 May 1975 - see Appendix III, doc. 4), the nine national parks in Spain are currently being reclassified.

Under the Act, Ordesa Valley National Park has been renamed Ordesa and Monte Perdido National Park and its area increased from 2,066 ha to 13,542 ha by the inclusion of the Añisclo and Escuain valleys and the Pineta cirque, all of them in the Monte Perdido massif (see Map 3). The boundaries of the new Ordesa and Monte Perdido National Park are detailed in Schedule No. 1 to the Reclassification Act (see Appendix III, doc. 7).

The Act extending the park was voted by the Cortes on 29 June 1982 and published in the Spanish Official Gazette on 30 June 1982.

2.2 Physical and natural characteristics

Because the park's extension is recent, this report discusses principal characteristics of either the original park (Ordesa Valley National Park) or the enlarged park (Ordesa and Monte Perdido National Park).

2.2.1 Topography (Map 5)

The main features are the park's high altitude and the steep-sided valley.

The highest point, Mondarruego, is 2,600 m above sea level and the lowest point, the confluence of the Arazas and Ara rivers, 1,100 mabove sea level; the maximum difference in altitude within the park is thus 1,500 m. The contours on Map 5 show that most of the park is situated between 1,500 and 2,000 mabove sea level. Altitudes expressed as percentages are:

over 2	,5	00 m:	•	2.5%
2,000	-	2,500	m:	23.1%
1,500		2,000	m:	46.1%
1,000	-	1,500	m:	28.3%

The most distinctive features of the park's steep slopes are the "fajas" (small, narrow cornices), and the most outstanding and most visited of these is the "Fajo de Pelay", which runs along the valley at an average height of 1,900 metres.

2.2.2 Lithology and stratigraphy (Map 7)

Geologically Ordesa Valley National Park belongs to the Secondary and, to a lesser extent, Tertiary Periods. It consists basically of huge layers of calcareous sediment accumulated in the alpine geosyncline; owing to changes in the level of the sea during the Secondary Period and a part of the Tertiary, the thickness of these layers varies.

2.2.3 Geology and geomorphology

The whole of the Ordesa Valley is a recumbent fold strongly inclined to the south. with the result that the crest of the anticline lies outside the park boundaries (this is clearly shown by Dalloni in Fig. 1).

The valley was formed by glacial action; the river Arazas subsequently carved out its bed and revealed in the process a stratigraphic cross-section of subhorizontal calcareous steps. The valley contains many typical karst features.

- 6 -

2.2.4 Pedology

The principal Pyrenean soil types are represented in the valley and range from "permafrost" (ground permanently frozen to a considerable depth) above 2,500 m to rendzinas on limestone with an AC profile, humus carbonate soils and shallow peaty soils of great pedological interest.

2.2.5 Climatology

Although the climate of the Ordesa Valley is in principle typically Pyrenean (essentially characterised by rigorous winters), it is in some respects distinctive because of the valley's east-west orientation (parallel to the axis of the Pyrenees range: this in itself is exceptional). The wind system, for instance, presents a transverse circulation of great interest (see Fig. 2).

Average temperatures are: spring 7° , summer 17° , autumn 10° and winter 3° .

Snow is the principal feature in winter and a part of the spring, when avalanches occur frequently.

2.2.6 Hydrology (Map 6)

The valley is drained by the Arazas, which rises in the Goriz ravine and, because of the valley's geological structure, follows a spectacular course of waterfalls throughout its length.

There are also many springs and, at high altitudes, instances of hydrological forms associated with karst.

2.2.7 Vegetation (Map 8)

The Ordesa Valley contains a very wide variety of Pyrenean flora ranging from common species such as Scots pine (<u>Pinus sylvestris</u>) to very interesting endemic Pyrenean specias such as Ramondya myconi and Pinguicola longifolia.

Typical mountain and high alpine plant formations are found (see Appendix I: Vegetation).

2.2.8 Fauna

There are large numbers of mammal, reptile, bird and fish species. Mammals are the most important and include over 500 head of izard (<u>Rupicapra pyrenaica</u>) and a mere thirty or so head of "bucardo" (<u>Capra pyrenaica pyrenaica var. Schinz</u>), which, as a threatened species unique in the world, is of exceptional significance (see Appendix II: Fauna).

2.3 Human characteristics

The interior of Ordesa Vallev National Park is uninhabited. The nearest village, Torla, is 6 km away.

2.3.1 Ownership

The greater part of the park (some two-thirds of its surface area) belongs to the municipality of Torla. The remainder, except for a few hectares (42) owned by private individuals in Torla, is the property of the state (see Map 9).

2.3.2 Traditional activities

The municipality of Torla exploited the natural resources of the valley prior to its being made a national park. The main activities were the same as in any other Pyrenean mountain region (timber, firewood and grazing), although inaccessibility constituted a major impediment. Tradition has it that, when the people of Torla heard that the national park was about to be set up in 1918, they organised a major tree-felling operation.

2.3.3 Current activities

Currently, only cattle grazing on a restricted scale (some thirty days a year) is allowed. For half the time the herds graze in the Soaso cirque, now within the national park's boundaries. The main activity is undoubtedly tourism, which is growing by the year. There are approximately 300,000 visitors each year, mostly in July and August, because throughout the winter and a part of spring snow makes the park inaccessible.

2.3.4 Access

The park may at present be reached by road from Biescas via the Cotefablo pass to Torla (provincial road No. 140) or from Boltana along the Ara valley to Torla, (provincial road No. 138). The entrance to the valley is 9 km from the junction of provincial roads Nos. 140 and 138. The road runs into the part for a distance of 3 km and ends at an esplanade, which is merely a stretch of stony ground left exposed when the Arazas changed course and now turned into a car park.

2.3.5 Facilities in the park

2.3.5.1 Car parking

Space for 700 cars.

2.3.5.2 Wardens' lodge

Small wooden building from which supervision of the park is organised.

2.3.5.3 Restaurant

The restaurant was built by the National Nature Conservation Institute (ICONA) and is run by the municipality of Torla. A small souvenir shop is adjacent.

2.3.5.4 Parador Nacional de Turismo

The Parador, opened in 1953, was unused for 12 years. In 1981 it was refitted and reopened to the public. It is run by the Ministry of Commerce and Tourism.

2.3.5.5 Visitors' centre

In 1979 ICONA erected a small building to house public information and environment services during the summer, but it was never used. It is now being altered in order not only to perform more satisfactorily the functions for which it is intended but also to blend with its environment.

2.3.5.6 Small refuges

These are located throughout the valley and provide shelter for visitors in bad weather.

2.3.5.7 Miradors (observation points)

These are to be found throughout the valley at such places as the best views are to be had or some outstanding natural feature demands.

2.3.5.8 Staff

A director, who is a Forestry Commission engineer attached to the Huesca Provincial Division of ICONA.

A planning team for Ordesa and Monte Perdido National Park made up of a Forestry Commission engineer, a biologist and a geographer, under the authority of the park director.

A forest ranger service, currently made up of three wardens who live in Torla.

A team of guides specially employed by ICONA in July, August and September (generally university students following various courses).

2.4 Extension of Ordesa Valley National Park to become Ordesa and Monte Perdido National Park

As was pointed out in section 2.1.2 above, the reclassification of the Ordesa Valley National Park has meant a more than sixfold increase in its surface area.

This increase is perfectly justified in every respect (in physical terms and in view of the fact that the Ordesa Valley is too small for the influx of visitors).

2.4.1 Physical aspects

Within the park's new boundaries are exceptionally important natural assets which should be protected:

- the Monte Perdido glacier, the Maladeta glacier and the small Posets glacier (in Huesca province too) are now the only "active" representatives in Spain of the intense Quarternary Period which shaped a large proportion of the national territory. These glaciers are important because, unlike Spain's others, they are not inactive remains of an earlier period but are still active, albeit to a limited extent.

The Monte Perdido glacier faced damage and even destruction when the municipality of Beilsa announced its intention of building a cable car for visitors and a permanent ski resort. Luckily, the scheme never got off the drawing board and is now impossible owing to the protected status afforded the site.

- The frozen cave at Casteret. This very important feature in the flat area of Millaris is in the highest underground glacier in the world (2,700 m) and consists of fossil ice covering 6,000 m².
- The Anisclo Valley and Canyon contain distinctive, particularly valuable ecosystems. The vegetation is not in itself exceptional, although its distribution is: thermal inversion has led to inversion of the normal vegetation pattern.
- The Escuain Gorges constitute a marvellous example of karst relief and contain many caves, most of them still unexplored.

The Pineta cirque is a typical example of glacial relief. From it one has a view over the Monte Perdido glacier.

These outstandingly important physical features of the national park are set in landscapes of exceptional beauty.

2.4.2 Human aspects

There is no permanent human habitation within the new national park's boundaries, only a few small, remote cabins not used for residential purposes.

The peripheral protection area contains important relics and survivals, eg the Megalithic dolmen and esoteric traditions of Tella, festivals which have retained their traditional features, and the Bielsa carnival. These are traditions which not only must not be lost but also should be studied so as to bring to light their many as yet unknown aspects. In the Affisclo canyon, within the park's boundaries, lies the hermitage of San Urbez, a leading place of pilgrimage.

The park's enlargement further means a widening of visitors' horizons. The Affisclo Valley and Escuain Gorges are at present virtually unknown to the majority of the population and are a target only for climbers or mountain folk. Declaring them to be part of a national park has demonstrably resulted in considerably greater visitor demand. Although the threat of damage by visitors exists, the development plan in preparation not only lays down rules for visitors but also stipulates which areas are closed to visitors; in the case of other areas certain conditions are imposed, and for a third group attempts are made to funnel visitors so that potential environmental damage is kept properly under control. The aim is thus to ensure that some visitors to Ordesa valley go elsewhere in the park and hence to avert the clear risk of damage in certain parts of the valley arising from the seasonal concentration of visitors and the foreseeable annual increase in their numbers.

3. European interest justifying the application

The general arguments for conserving the Ordesa and Monte Perdido National Park in its natural state have just been explained. Specific arguments may be classified under:

- national interest: by IUCN standards for national parks, it is the most important example of Pyrenean ecosystems;
- worldwide interest: a threatened subspecies unique in the world, <u>Capra pyrenaica pyrenaica var. Schinz</u>, is to be found there. The Ordesa Valley is its last redoubt;

- European interest: an important point is that it is separated from France's Western Pyrenees National Park by no more than an administrative frontier.

The national park's management body, ICONA, believes that a territory forming a geographical unit should not be subject to different basic management and conservation systems simply because it lies astride a frontier.

In this context, the frequent contacts with the French national park's administration should be noted. It is to be hoped that they will be intensified, with a view to establishing common criteria for basic issues such as conservation of species and general principles of park management, despite current differences of opinion regarding primarily the exploitation of natural resources as practised in the French national park (on the Spanish side, such exploitation is confined to scientifically justified, short-term summer grazing and, in the Arazas Valley, fishing at certain times in prescribed conditions).

Grazing is scientifically justified because of the current state of dependence of subalpine pasture: if severe limitations on livestock grazing were introduced, the quality of current pasture land would begin to decline. Furthermore, tending flocks and herds is an activity as old and traditional as the sedentary life of the inhabitants of the Pyrenees: it is, with the timber industry, their fundamental and necessary activity. In practice, these two major resources alone have enabled the people to survive, a survival threatened by the very severe living conditions prevalent in the area. The municipalities affected by the national park are aware of the problem, which is offset to some extent by the growth in tourism: it is to be hoped that tourism will generate new jobs and enhance material well-being.

As regards tourism too, contact will be made with the French national park: joint work should without question result in fuller knowledge for both the French and the Spaniards of two territories which are, in fact, merely the north and south faces of a single geographical unit, the Pyrenees.

Thus, for the time being, it will be Spain's only transfrontier park. And, since there are unlikely to be any further developments along these lines, the situation is clearly of great interest not only for the two countries directly concerned but also for Europe as a whole: the two parks together will offer the best illustation of the Pyrenean range from every angle, ranging from geology (the great convulsion which, in the Tertiary Period, altered Spain's land structure is easily visible) to the history of human occupation through the ages as reflected not only in remains such as a dolmen but also in the survival of ways of life from the recent and distant past.

4. <u>Geographical description and boundaries of Ordesa and Monte Perdido</u> National Park

4.1 Ordesa Valley National Park

The Ordesa Valley National Park is enclaved in the central Pyrenees in the province of Huesca. The Royal Decree of 16 August 1918 (see Appendix III) stipulates its co-ordinates as follows:

- northern limit: $42^{\circ}40'30"$ N
- southern limit: 42°37'40" N
- eastern limit: $3^{\circ}42'30''$ E of the Madrid meridien
- western limit: 3⁰35'10" E of the Madrid meridien.

The park's geographical boundary is set out in the same royal decree.

4.2 Ordesa and Monte Perdido National Park

Reclassification entailed the incorporation in the park of the Monte Perdido massif, the Amisclo Valley and Canyon, the Escuain Gorges and the Pineta cirque. The park's geographical boundary is set out in a schedule to the Act (see Appendix III, doc. No. 7).

Ordesa Valley National Park consisted exclusively of land owned by the municipality of Torla or the state. Extension has resulted in the inclusion of land belonging to the municipalities of Beilsa, Tella-Sin, Fanlo and Puertolas too.

Section 4 of the Act provides for the creation of peripheral protection areas, the limits of which are likewise defined in a schedule.

The Act also establishes a zone of influence covering the whole of the territory of municipalities extending into the national park and peripheral protection area. The municipalities concerned are thus: Bielsa, Broto, Fanlo, Puertolas, Tella-Sin and Torla (see Map 4).

5. <u>Statutory protection for Ordesa and Monte Perdido</u> National Park

5.1 Past and present measures

- 5.1.1 National Parks Act of 7 December 1916
- 5.1.2 <u>Royal Decree establishing Ordesa Valley National Park</u>, <u>16 August 1918</u>
- 5.1.3 <u>Ministerial Order for a public inquiry into the enlargement of</u> Ordesa Valley National Park (Ministry of Agriculture, 31 October 1974)
- 5.1.4 Protected Natural Landscapes Act, 2 May 1975
- 5.1.5 Royal Decree approving the implementing of regulations for the <u>Protected Natural Landscapes Act (Law No. 15 of 2 May 1975)</u>, <u>4 March 1977</u>
- 5.1.6 Ordesa and Monte Perdido National Park (Reclassification and Extension) Bill, 20 October 1981
- 5.1.7 Ordesa and Monte Perdido National Park (Reclassification and Extension) Act (Law No. 52 of 13 July 1982)
- 5.2 <u>Summary of the Ordesa and Monte Perdido National Park (Reclassification</u> and Extension) Act, No. 52 of 13 July 1982

The Act consists of 18 sections, three final provisions and two schedules. The scope of the different sections is as follows:

Section 1

The purpose of the park, which complies with IUCN standards for national parks.

Section 2

The territory included in the new park (the exact boundaries are set out in Schedule No. 1). Ownership and the methods for legally incorporating further land into the park where necessary.

Section 3

Certain specific restrictions on the use of the park; special soil protection measures.

Section 4

Establishment of peripheral protection areas (the boundaries of which are specified in Schedule No. 2); special soil protection measures and use restrictions shall be binding.

Section 5

Creation of a zone of influence and definition of its extent (ie all municipalities with land in the park or its peripheral protection area) and purpose (primarily protection and socio-economic development).

Section 6

A development plan to be drawn up within a year; the main points to be included therein are specified.

Section 7

Special development plans to be drawn up in the light of the general development plan provided for in the previous section.

Section 8

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Need for co-operation with other bodies, especially France's Western Pyrenees National Park.

Section 9

Certain restrictions regarding the prospection and extraction of minerals and the cutting/removal of plant species.

Section 10

Composition, role and functions of the park's board of management.

Section 11

A standing committee of the board of management to be established.

Section 12

Appointment of the park's director/warden by ICONA, subject to the prior approval of the board of management.

Section 13

Conditions governing the transfer of ownership of land within the park.

Section 14

Resources available for managing the park.

Section 15

The municipalities on whose territory the park is situated to have prior claim regarding any concession, authorisation of provision of services and public use provided for in the development plan.

Section 16

The penalties to be imposed for infringement of the regulations applicable in the park.

Section 17

Measures to be taken by the public authorities to ensure strict compliance with the regulations concerning protection of the park's assets.

Section 18

Prohibits the granting of concessions for the use of surface or underground waters, unless they are deemed essential in the development plan.

FINAL PROVISIONS

1. A royal decree to be promulgated regarding possible military use of land within the park's boundaries.

2. The government to be allowed a maximum of one year in which to issue the necessary regulations for the implementation and enforcement of this Act.

3. The new board of management to be set up within two months.

6. BIBLIOGRAPHY OF WORKS RELATING DIRECTLY OR INDIRECTLY TO ORDESA AND MONTE PERDIDO NATIONAL PARK

ALBERTO F.

"La naturaleza de los suclos del Parque Nacional de Ordesa" Conferencia al grupo de trebajo hispano-norteamericano de planificación del Parque Nacional de Ordesa y Monte Perdido. 1.979

ALASTRUE A.; ALMELLA y RIOS J. M.

"Explicación al mapa geológico de la provincia de Huesca" Instituto Geológico y Minero de España. Madrid 1.967.

ARITIO B.

"Los Parques Nacionales Españoles" INCAFO 1.975.

"Los Parques Nacionales Españoles" INCAFO 1.979.

"Cuía de los Parques Nacionales Españoles" INCAFO 1.982.

ASCASO LIRIA A.

"Avance climatológico y meteorología del Parque Nacional de Ordesa y Monte Perdido"

Conferencia a las reuniones de trabajo hispano-norteamericanas del equipo planificador del Parque Nacional de Ordesa y Monte Perdido. 1.979.

BALCELLS ROCAMORA E.

"Comentarios referidos e los recursos faunísticos del Parque Nacional de Ordesa ampliado"

Conferencia para la reunión de trabajo de los cquipos hispano-norteamericano de planificación del Parque Nacional de Ordesa y Monte Perdido. 1.979.

BERNUES F.

"Notas limnológicas del Parque Nacional de Ordesa y Monte Perdido" Conferencia para la reunión de trabajo de los equipos hispano-norteamericano de planificación del Parque Nacional de Ordesa y Monte Perdido. 1.979. BOYE

"Gelivation et crioturbation dans le massif du mont-Perdu" Pinipeos 1.952.

BRIET L.

"Bellezas del Alto Aragón"

Exema. Diputación de Huesca. 1.977.

BRUNET R.

"Un exemple de la regression des glaciers pyrcheens"

Rev. Pirineos números 39-42. Zaragoza 1.956.

CALVO PALACIOS J.L.

"Situación socioeconómica actual y perspectivas del Parque Nacional de Ordesa y su ampliación"

> Conferencia para la reunión de trabajo de los equipos hispano-norteamericano de planificación del Parque Nacional de Ordesa y Monte Perdido. 1.979.

CASTERET

"La grutte glacée"

Rev. Pyrenees

CUADRAT J.M.

"El clima del Pirineo Central Ensayo de Aplicación al turismo de montaña"

Tesis Doctoral, Zaragoza 1.981.

DAUMAS M.

"La vie rurale dans le haut Aragon Oriental" C.S.I.C. Madrid 1.976.

"Un type d'evolution de moyenne montagne mediterraneene: Les Pyrenees Centrales espagnoles"

Supervivencia de la montaña. Actas del coloquio hispanofrancés sobre areas de montaña. Ministerio de Agricultura. Madrid 1.981.

DUPCNT P.

"Parques Nacionales y Reservas de España y Europa" Ed. BLUME Ecología. 1.979.

ESPAÑA de, Arnaldo

"El Parque Nacional del Valle de Ordesa"

Comisarla de Parques Nacionales. Ministerio de Agricultura. Madrid 1.935. EQUIPO PLANIFICACION AMERICANO DEL PARQUE NACIONAL DE ORDESA Y MONTE PERDIDO

"Ordesa Valley National Park, Spain (Monte Perdido Enlargement). Management Recommendations". 1.981.

FERNANDEZ-REYES MOLINA J.

"Parque Nacional de Ordesa"

Servicio Nacional de Pesca Fluvial y Caza. 1.965.

GARCIA SAINZ L.

"Las superficies de erosión que preceden a los glaciares cuaternarios del Pirineo Central y sus recíprocas influencias" . Madrid 1.940.

"Las fases epiglaciares del Pirineo español" Estudios geográficos 1.941

"Nota acerca de las fases glaciares del Pirineo español" Boletín de la Real Sociedad Geográfica. 1.944.

GAUSSEN H.

"Parcs Nationaux aux Pyrenées" Rev. Pirineos. Jaca 1.966.

GOMEZ LLARENA J.

"Algunos datos sobre el glaciar actual de Monte Perdido" Bol. Soc. Esp. Hist. Nat. Tomo XXXVI. 1.936.

GUIRAL PELEGRIN J. J.

"El paisaje vegetal del Farque Nacional de Ordesa y Monte Perdido".

Huesca 1.980.

HERNANDEZ PACHECO F. y VIDAL BOX C.

"La tectónica y la morfología del macizo del monte Perdido y de las zonas de cumbres inmediatas en el Pirineo Central". Pirineos nº 4. 1.946.

ICONA

"Parque Nacional de Ordesa y Monte Perdido"

Ampliación y Reclasificación, memoria justificativa. 1.981.

"Farques Nacionales en España" 1.981.

LAFARGA CASTELL L.

"Papel cultural del Parque Nacional de Ordesa y Monte Perdido" Conferencia para la reunión de trabajo hispano nertecnie-

ricane del equipo de planificación del Panque Nacional de

Ordess y Monte Perdido. 1.979.

LCPEZ RAMON F.

"La Conservación de la Naturaleza: Los espacios naturales protegidos"

Publicaciones del Real Colegio de España. Bolonia 1.980.

MALLADA L.

"Descripción física y geológica de la provincia de Huesca" Madrid 1.873.

MARRACO S.

"Salto del Bellós"

Andalán nº 349. 1 982.

MARTIN GRASSET J. J.

"Una primera al Monte Perdido" Rev. Peñalara nº 400 Especial. 1.974.

MARTIN RETORTILLO L.

"Problemas jurídicos de la tutela del paisaje" Revista de Administración Pública. nº 71. 1.973.

"Aspectos administrativos de la creación y funcionamiento de los Parques Nacionales"

Revista Española de Derecho Administrativo. Civitas nº 6 1.975.

MARTINEZ LASIERRA P.

"La geografía en la Planificación de los Espacios Naturales Protegidos: El Parque Nacional del Valle de Ordesa"

Zaragoza 1.982.

MARTINEZ LASIERRA P., y GUIRAL J.

"El papel de los Parques Nacionales y otros espacios naturales protegidos. El Parque Nacional de Ordesa y su ampliación" Conferencia del Día Forestal Muncial 1.980.

MENSUA S.

"Informe de la Câtedra de geografía de la Universidad de Zaragoza de la ampliación de Ordesa"

Zaragoza 1.975.

MEN SUA S.

"Formación y evolución del macizo de Monte Perdido"

Conferencia para la reunión de trabajo del equipo hispano-

🐘 norteamonicana de planificación del Parque Nacional de

Ordesa y Monte Perdido. 1.979.

MISCH P.

"Estructura tectónica de la región contral de los Pirincos"

Fublicaciones extranjeros sobre geología de España.

C.S.I.C. Patronato Alfonso X el Sabio. Madrid. 1.948.

MONTSERRAT RECODER P.

"La originalidad florística del Pirineo español. Dinámica del Parque Nacional de Ordesa ampliado"

Conferencia para la reunión de trabajo hispano-norteamericana del equipo de planificación del Parque Nacional de Ordesa y Monte Perdido. 1.979.

MUÑOZ GOYANES G.

"Parques Nacionalcs" Rev. Montes 1,961.

"Parques Nacionales Españoles"

Dirección Ceneral de Montes, Caza y Pesca Fluvial. Madrid 1.972.

ORTUÑO MEDINA F.

"El medio ambiente rural: Los Parques Nacionales" De Economía nº 140, 1.977.

"La Política de Espacios Naturales Protegidos en España" Comunicación al XXXIII Congreso Luso-Español para el progreso de las ciencias.

PALUZIE MIR L.

"Los problemas del medio natural. Legislación sobre protección y ordenación de los espacios naturales"

Revista de Derecho Urbanístico nº 51. 1.977.

PASCUAL GARCIA R.

"El bucardo de los Pirineos"

Rev. Trofco nº 141. Año XIII. 1.982.

PEÑA GUARA

"Numero monográfico dedicado al valle de Añisclo"

Boletín de contribución al Catélogo espeleológico de la provincia de Huesca. 1.975.

PLANDE R.

"La nieve y los glaciares en el Pirineo" Rev. Pirineos nº 5. 1.947.

RAMOND

"Viaje a la cima del Monte Perdido" 1.803.

RUTTEN M. G.

"Nota preliminar sobre la geología de los Pirineos de la provincia de Huesca"

Estudios geológicos nº 25. C.S.I.C. 1.955.

SANCHEZ C., VILLAVERDE C.

"Avifauna del Parque Nacional de Ordesa"

Fauna de Aragón: Las aves. Guara Editorial 1.981.

SELZER

"Geología de las Sierras Sur pirenáicas del Alto Aragón" Publicaciones extranjeras sobre geología de España. C.S.I.C. Patronato Alfonso X el Sabio. Madrid 1.948.

SOLE SABARIS L.

"Los Pirineos"

E. Alberto Martín. Barcelona 1.951.

UICN

"Liste de Nations Unies des Parks Nationaux et Reserves Analoges" Morgues 1.975.

VAN DE VELDE E. J.

"Geology of the Ordesa overtrhrust mass, Spanish Pyrenees, province of Huesca"

Estudios geológicos vol. XXIII. 1.967.

VILLUENDAS DIAZ A.

"El Parque Nacional de Ordesa"

Revista Campo. Banco de Bilbao. 1.981.

<u>APPENDIX I</u>

VEGETATION OF ORDESA AND MONTE PERDIDO NATIONAL PARK

FUNDAMENTAL CHARACTERISTICS

The three types of vegetation found within the park are sub-Mediterranean, mountain and alpine. The park's altitude range is from 700 m to 3,355 m (Monte Perdido summit). Much of the land is calcareous, and its topography and geomorphology decisively influence its vegetation and flora, which are typical of chalk soils. The importance of the territory within the national park is illustrated by the opinion of the French botanist P. Chouard, who wrote as early as 1928 that "between the heights of Monte Perdido and the 1,200-metre deep Niscle Canyon lies a succession of landscapes almost unique in Europe".

Sub-Mediterranean vegetation

Mountain oaks (<u>Quercetum rotundifoliae buxetosum</u>), with <u>Quercus ilex ssp</u> rotundifolia as the dominant species; box trees (<u>Buxus sempervirens</u>), <u>Viburnus tinus</u>, <u>Phillyrea media</u>, <u>Aristilochia pistolochia</u>, <u>Rosmarinus officinalis</u>, <u>Juniperus oxicedrus</u>, <u>J. phoenicea</u>, <u>Rubia peregrina</u> and enclaves of <u>Arbutus unedo</u>. There are too plantations of <u>Querceto-buxetum</u> with <u>Quercus gr. faginea</u>, as well as stretches of boxwood scrub, dry forests of Scots pine (<u>Pinus sylvestris</u>) and dry pasture.

Mountain vegetation

This consists of the extensive forests lining the sides and bottoms of valleys and gorges. The first of the two commonest vegetation types is of Scots pine (<u>Pinus sylvestris</u>) and boxwood (<u>Buxus sempervirens</u>) forest, with undergrowth including species such as <u>Amelanchier ovalis</u>, <u>Cytisus sessilifolius</u>, <u>Coronilla emrus</u>, <u>Acer monspesulanum</u>, <u>Serbus aria</u>, <u>Anemone hepatica</u>, <u>Helleborus</u> <u>viridis and Daphne laureola</u>. On ridges and the steepest of south-facing slopes is to be found a spiky heathland of <u>Echinospartium horridum</u> (<u>Genista horrida</u>).

The second major type consists of fir (Abies alba) and beech (Fagus sylvatica) forests forming the sparsely represented <u>Galieto-Abietetum</u> association. There are also rare beech stands (<u>Helleboreto-Fagetum</u>) with <u>Helleborus viridis</u>, <u>Oxalis acetosella</u>, <u>Poa nemoralis</u>, etc. The beech stand most typical of <u>calcareous Pyrenean soils is Scilleto-Fagetum buxetosum</u> with its abundance of boxwood, <u>Acer opalus sp. opalus</u>, <u>Sorbus aria</u>, etc. <u>Buxeto-Fagetum</u> is found on the steepest slopes.

In addition there are enclaves of mixed deciduous trees (<u>Tilia cordata</u>, <u>Fraxinus excelsior</u>, etc), copses of aspen (<u>Populus tremula</u>) and birch (<u>Betula</u> <u>pubescens</u>), and typical waterside stands (<u>Salix eleagnus</u>, <u>Fraxinus angustifolia</u>).



Subalpine and alpine vegetation

The distinctive subalpine communities consist of scattered pine forest (<u>Pinus uncinata</u>) with clumps of <u>Rhododendron ferrugineum</u> and <u>Vaccinium myrtillus</u> as well as mountain willows (<u>Salix herbacea</u>, <u>Salix pyrenaica</u>). In many places pines are replaced by beech, birch and rowan (<u>Sorbus aucuparia</u>). The <u>Pinus</u> <u>uncinata</u> forest constitutes the natural limit of forests generally, above the beech and fir forests.

Treeless areas account for 88% of the national park's territory. Of these areas, 52% consist of a grass formation called alpine "tasca" and the remainder is made up of plant formations specific to stony and rocky ground and to flooded soils. The alpine tasca and subalpine pasture consist of formations of <u>Festuca</u> <u>eskia</u> and <u>Festuca spadicea</u> on decarbonated ground. The most widespread community is the one characterised by <u>Festuca scoparia</u>, which is typical of calcareous plateaux at particular altitudes. The most representative species are: <u>Festuca scoparia</u>, <u>Vicia pyrenaica</u>, <u>Androsacea villosa</u>, <u>Sideritis hyssopifolia</u>, <u>Satureja alpina</u>, <u>Gentiana verna</u>, <u>Avena montana</u>, <u>Poa alpina</u>, etc. There are also enclaves of the group represented by <u>Elyna myosuroides</u> and <u>Oxytropis foucandii</u> with <u>Poligonum viviparum</u>, <u>Carex corvula</u>, <u>Cerastium alpinum</u>, <u>Draba silicuosa</u>, etc. The predominant vegetation in permanently wet areas consists of <u>Carex devalliana</u> and other Carex species (<u>Carex frigida</u>, <u>Carex flacca</u>, etc), as well as, in places, Eriophorum latifolium.

The formation normally found on scree is <u>Crepidium pygmea</u>, the dominant species being <u>Crepis pygmea</u> with <u>Ranunculus parnassifolius</u>, <u>Carduus cardinoides</u>, <u>Cirsium glabrum</u>, <u>Aquilegia pyrenaica</u> and sometimes <u>Dioscorea pyrenaica</u>.

Finally, there are the rupicolous plant communities found on steeply sloping mountain sides, rocks, precipices and calcareous plateaux. These are the home of many endemic Pyrenean species. One plant typical of the most shaded rocks is <u>Ramondia pyrenaica</u>, an interesting, endemic species of Tertiary flora. Also found are Lonicera pyrenaica, Draba aizooides, Potentilla nivalis, <u>P. alchemilbides</u>, <u>Globularia nana, Asperula hirta, Saxifraga longifolia</u>, etc. When water seeps through the rock, Pinguicola longifolia, <u>Carex tenuis</u>, etc are found.

SPECIAL FEATURES OF FLORA AND VEGETATION

Mountain oak stands (<u>Quercus ilex ssp. rotundifolia</u>) with boxwood (<u>Buxus sempervirens</u>) and enclaves of strawberry trees (<u>Arbutus unedo</u>), as well as other typically Mediterranean plants (<u>Phyllirea media</u>).

Thermal inversion in the Añisclo Valley with "estacion abisal" and the presence of Rhododendron ferrugineum at an altitude of 960 m.

Periglacial phenomena with highly distinctive flora at the Arrablo Pass and in the Sierra Custodia (2,000-2,600 m) - <u>Ranunculus parnassifolius</u>, Brimeura anethystinas, <u>Brassia repanda</u>, <u>Arenaria tetraquera</u> and <u>Borderea pyrenaica</u>.

Examples of typical Pyrenean beech stands are to be found in the Anisclo and Ordesa Valleys.

Forests of Scots pine (<u>Pinus sylvestris</u>) with boxwood and <u>Echinospartium</u> horridum typical of the central Pyrenees and sparse forests of <u>Pinus uncinata</u> with Rhododendron ferrugineum.

Residual clumps of yew (Taxus baccata) in the Bujaruelo Valley in the peripheral protection area.

Abundant examples of the distinctive flora of rupicolous associations and of springs and wet ground.

APPENDIX II

FAUNA OF ORDESA AND MONTE PERDIDO NATIONAL PARK

STANDARD LIST OF VERTEBRATE FAUNA SPECIES PRESENT IN THE ORDESA AND MONTE PERDIDO NATIONAL PARK

AMPHIBIA

Urodela:

* Euproctus asper (Duges)

Salamandra salamandra (Schreiber)

Anura:

Bufo bufo spinosus (Dawdin)

Alytes obstetricans (Laurenti)

Rana temporaria (Linnaeus)

REPTILES

Sauria:

Anguis fragilis (Linnaeus)

Lacerta hispanica (Steindechner)

Lacerta muralis (Linnaeus)

* Lacerta monticola (Boulenger)

Ophidia:

Coronella austriaca (Laurenti)

Natrix maura (Linnaeus)

Natrix natrix (Linnaeus)

Vipera aspis (Linnaeus)

* Endemic Iberian species

Symbols used in the standard list of bird species

The status of each bird species in Spain is indicated by one of the following symbols before the Latin name:

- ***** endemic Iberian species
- и in danger of extinction
- **O** threatened
- \triangle species uncommon in Spain

Status in Ordesa and Monte Perdido National Park is indicated by symbols after the vernacular name thus:

winter visitor

summer species

species of passage

sedentary or present all year

nesting

status undefined at present

no information available

Status Nesting Milvos milvus S Si Milvus migrans Р Accipiter gentilis S ζŗ, △ Accipiter nisus S SI Buteo buteo S Sd Hieraaötus fasciatus Δ Sd Aquila chrysaetos S 0 6 Circactus gallicus Ρ Neophron perchopterus E 0 Gypaëtus barbatus \$ S ٢ Gyps fulvus S no cria en P. 0 Falco peregrinus S 0 G Falco subbuteo 0 E Sd Falco tinnunculus S **G** . Lagopus mutus S e Δ Tetrao urogallus 0 S Sd Perdix perdix S Coturnix coturnix Ε Sd Tringa hypoleucos E Э Columba palumbus ΕP 8 <u>Cuculus canorus</u> . P Sd <u>Tyto alba</u> E C • Asic otus Sd Sd G Strix aluco. S Caprimulgus europeaus Ε SJ Apus apus E Sd Apus melba Ε 0 Alcedo atthis Ē SJ Upupa epops E Sd

SN-ZP (86) 22 Appendix II

•		Status	Nesting
	Jvnx torquilla	E	Sd
	Picus viridis	S	(\$
*	Dryocopus martius	S	()
	Dendrocopos major	S	0
0	Dendrocopos leucotos	S	Sd
	Alauda arvensis	E	Sd
	<u>Hirundo rupestris</u>	E	0
	<u>Hirundo rustica</u>	ΕP	;
	<u>Delichon urbica</u>	ΕP	ŵ
	<u>Anthus trivalis</u>	E	Sd
	Anthus spinoletta	E	Q
	Montacilla cinerea	S	Ø
	Motacilla alba	S	€
	Lanius collurio	E	N
	Lanius senator	E	Sd
0	Cinclus cinclus	S	G
	Troglodytes troglodytes	S	Ø
	Prunella collaris	E	G
	Prunella modularis	S .	Q
	<u>Sylvia borin</u>	E ···	(Q)
	<u>Sylvia atricapilla</u>	E	Ø
	<u>Sylvia communis</u>	E	0
	Phylloscopus trochillus	S	K a
	Phylloscopus bonelli	E	Sd
Δ	Phylloscopus sibilatrix	P	
	Regulus regulus	S	5
	Regulus ignicapillus	S	Ċ
	Ficedula hypoleuca	Р	
	<u>Muscicapa striota</u>	E	œ
	Oenanthe oenanthe	E	Q
	Oenanteh hispanica	P	

	Status	Nesting
Monticola saxatilis	E	¢
Phoenicuras ochruros	E	0
Phoenicurus phoenicurus	E.	
Erithacus rubecula	S	E 👧
Luscinia megarhynchos	E	Sd
A Turdus torquatus Mirlo	P,I	-
Turdus merula	S	•
Turdus iliacus	P	
Turdus philomelos	S	(î
Turdus viscivorus	S	Ø
Aegithalos caudatus	S	9
Parus palustris	S	Q
Parus cristatus	S	. 🕑
Parus ater	S	19 3 9
Parus caeruleus	S	8
Parus major	S	-
Sitta europaea_	S	0
Trichednoma muraria	S	© ·
Certhia familiaris	S	G
Certhia brachydactyla	S	6
Emberiza citrinella	E	e
Emberiza cia	S	6
Emberiza cirlus	S	O
Fringilla coelebs	S	ал (т. С Ф
△ Serinus citrinella	S	- 🔁
Serinus serinus	Sd	
Carduelis spinus	P	
Carduelis carduelis	S	Ŷ
Carduelis cannabina	S	0
Pyrrhula pyrrhula	S	œ
Loxia curvirrostra	E	Sd
	• .	

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	Status	Nesting	
A Montifringilla nevalie	8	ŝ.).	
Garrulus glandavius	S	Ċ.	
Pica pica	S	Sa	
Pynnhocorax pynnhocorax	S	63	
A Pyrrhocorax graculus	S	O	н. У 1. % И
Corvus corona	V.	G	
Corvus corex	S	e	
Passer domesticus	S	O -	
Petronia petronia	S S	G	
Galidris alba	P		
•	•		

~5

MAMMALS

Insectivores

Talpa ouropana cineren (Gmelin)

Galemys pressaious

Sorex minotus (Linnaeus)

Sovex annueus (Linnaeus)

Neomys fodiens (Pennat)

Suncus etruscus (Savi)

Crocidura russula pulchra (Cabrera)

Carnivores.-

Vulpes vulpes (Linnaeus)

Martes martes martes (Linnaeus)

Martes foina foina (Erx leben)

Mustela erminea (Linnaeus)

Mustela nivalis (Linnaeus)

<u>Lutra lutra</u> (Linnaeus)
<u>Genetta genetta</u> (Linnaeus)
Felis sylvestris (Schrebes)

Artiodactyla. -

Sus scrofa (Linnaeus)

Capreolus capreolus (Linnaeus)

Rupicapro rupicapra pyrenaica (Bonaparte)

* Capra pyrenaica pyrenaica (Schinz)

Leporidae .-

Lepus europaeus (Linnacus) Liebre europea Sciuridae.-

Sciurus vulgaris (Linnaeus)

Gliridae. -

Eliomys quercinus quercinus (Linnaeus)

<u>Glis glis pyrenaicus</u> (Cebrora)

Muridae .-

Apodemus flavicollis (Melchior)

Apodomus sylvations (Linnaous)

Mud sprotus

Clethrionomys glarcolus vasconiae (Miller)

Pitymys pyranaicus

Pitymys gr. duodecincostatus

Microtus nivalis aquitanicus (Martius)

Microtus arvalis (Pailas)

Microtus agrestis (Linnaeus)