

## Supplementary 3

### Results by indicator and national park

#### 1. STATE OF CONSERVATION

##### 1.1. Endangered species' population trends

###### ▪ Ordesa NP

There are two species included as 'Endangered' the Spanish Threatened Species Catalogue that dwell Ordesa NP regularly: *Cypripedium calceolus* and *Gypaetus barbatus*. There are two other 'Endangered' species with sporadic presence in the NP: *Myotis capaccinii* and *Ursus arctos*. Population trends of both endangered species regularly present in Ordesa NP (Ordesa, Tormosa and Soaso) are shown in the table below.

Species	Number of individuals 2012	Number of individuals 2013	Number of individuals 2014	Number of individuals 2015	Value
<i>Cypripedium calceolus</i>	907	1.159	1.644		2
Species	Number of reproduction units 2012-13	Number of reproduction units 2013-14	Number of reproduction units 2014-15	Number of reproduction units 2015-16	Value
<i>Gypaetus barbatus</i> *	12	12	12	12	1
VALUE					2

\*NP's administration data (Elena Villagrasa comm. pers.)

###### ▪ Guadarrama NP

Data to evaluate this indicator could not be retrieved.

#### References:

Goñi, D. 2012. Ejecución del plan de recuperación de *Cypripedium calceolus*. Memoria 2012. Departamento de Medio Ambiente, Gobierno de Aragón y Larre.

Goñi, d. 2014. Ejercución de los Planes de Recuperación de *Borderea chouardii* y *Cypripedium calceolus*. Memoria de 2014. Larre.

Goñi, D. 2015. Seguimiento de poblaciones fundadas y reforzamientos de las especies *Borderea chouardii* y *Cypripedium calceolus*. Memoria de 2014. Larre.

Goñi, D., García, M. B. y Guzmán D. 2015. *Seguimiento de la flora vascular de España. Seguimiento demográfico y estado de conservación de *Borderea chouardii* y *Cypripedium calceolus* (Zapatito de La Dama)*. Dirección General de Calidad y Evaluación Ambiental y Medio Natural, Ministerio de Agricultura, Alimentación y Medio Ambiente. Madrid.

## 1.2. Changes in the extent of focal habitats

- Ordesa NP

No comparable focal habitat data were available.

- Guadarrama NP

Data to evaluate this indicator could not be retrieved.

## 1.3. Changes in the features for which the PA was designated

- Ordesa NP

Air quality and geomorphology were among the features to be preserved according to the NP's designation norm (Spanish Government, 1982), but there were no updated data on them.

- Guadarrama NP

The conservation objectives in the NP's designation norm (Spanish Government, 2013) are too generic to be evaluated.

## References:

Spanish Government. 1982. Ley 52/1982, de 13 de Julio, de reclasificación y ampliación del Parque Nacional de Ordesa y Monte Perdido. *Boletín Oficial del Estado*, 131: 20627-20629.

Spanish Government. 2013. Ley 7/2013, de 25 de junio, de declaración del Parque Nacional de la Sierra de Guadarrama. *Boletín Oficial del Estado*, 152: 47795-47852.

## 1.4. Visual impact

- Ordesa NP

The average, weighted visual impact in and around Ordesa NP was 2.2 (CNIG, 2009, 2010).

- Guadarrama NP

The average, weighted visual impact in and around Guadarrama NP was 8.4 (CNIG, 2009, 2010).

**References:**

CNIG, 2009, BTN25, Base Topográfica Nacional a escala 1:25.000

<http://centrodedescargas.cnig.es/CentroDescargas/linkUnMD>

CNIG, 2010, MDT25, Modelo digital del terreno con paso de malla de 25 m

<http://centrodedescargas.cnig.es/CentroDescargas/linkUnMD>

## 1.5. Surface water quality

- Both NPs

2015													
National Park	River/lake/dam	Municipality	Date	Number of measurements	Dissolved O <sub>2</sub> (mg/l)	BOD <sub>5</sub> (mg/l)	pH	Total Phosphorus (mg/l)	Nitrates (mg/l)	Nitrites (mg/l)	Ammonium (mg/l)	Q <sub>i</sub>	Q <sub>w</sub>
Ordesa	River Arazas	Torla	15/06/2015	1	9.30		8.10	0.05	1.00	0.02	0.13	6	2
Guadarrama	Dam of Pinilla	Lozoya	2015	12 (1 for total P)	9.98	2.34	7.49	0.02	1.03	0.02	0.07	7	
Guadarrama	River Canencia	Canencia	2015	4	10.08	2.00	7.38	0.05	2.50	0.05	0.10	7	
Guadarrama	Lake Los pájaros	Rascafría	21/05/2015	1	9.80	2.00	6.60	0.05	2.50	0.05	0.10	7	
Guadarrama	Wetland lake complex	Rascafría	21/05/2015	1	9.50	2.00	6.70	0.05	2.50	0.05	0.10	7	
Guadarrama	Big lake of Peñalara	Rascafría	21/05/2015	1	9.20	2.00	6.50	0.05	2.50	0.05	0.10	7	
Guadarrama	River Manzanares	Manzanares El Real	2015	4	10.23	2.00	7.45	0.05	2.50	0.05	0.10	7	
Guadarrama	River Navalmedio	Cercedilla	2015	4	10.03	2.00	7.28	0.07	2.50	0.05	0.10	7	
Guadarrama	River Moros	El Espinar	2015	6	9.10	1.00	7.48		0.10		0.13	5	
Guadarrama	Dam of Peces	Navas de Riofrío	2015	4	7.81	3.00	7.22	0.02	0.13	0.01	0.10	7	
Guadarrama	River Frío	Real Sitio de San Ildefonso	2015	4	9.17	1.00	7.56		0.10		0.13	5	

National Park	River/lake/dam	Municipality	Date	Number of measurements	Dissolved O <sub>2</sub> (mg/l)	BOD <sub>5</sub> (mg/l)	pH	Total Phosphorus (mg/l)	Nitrates (mg/l)	Nitrites (mg/l)	Ammonium (mg/l)	Q <sub>i</sub>	Q <sub>w</sub>
Guadarrama	River Eresma	Real Sitio de San Ildefonso	2015	8	10.03	1.00	7.50	0.01	0.91	0.02	0.11	7	
Guadarrama	River Cambrones	Real Sitio de San Ildefonso											
Guadarrama	Dam of Torrecaballeros	Santo Domingo de Pirón	2015	5	8.78	1.00	7.89	0.01	0.58	0.02	0.13	7	<b>2</b>

2014													
National Park	River/lake / dam	Municipality	Date	Number of measurements	Dissolved O <sub>2</sub> (mg/l)	BOD <sub>5</sub> (mg/l)	pH	Total Phosphorus (mg/l)	Nitrates (mg/l)	Nitrites (mg/l)	Ammonium (mg/l)	Q <sub>i</sub>	Q <sub>w</sub>
Ordesa	River Arazas	Torla	18/06/2014	1	9.80		7.80	0.05	1.00	0.02	0.13	6	<b>2</b>
Guadarrama	Dam of Pinilla	Lozoya	2014	12	10.10	2.25	7.53	0.02	1.25	0.02	0.09	7	
Guadarrama	River Canencia	Canencia	02,05,08,11/2014	4	10.35	2.00	7.3	0.05	2.50	0.05	0.10	7	
Guadarrama	Lake Los pájaros	Rascafría	19/05/2014	1	8.30	2.00	7.4	0.05	2.50	0.05	0.10	7	
Guadarrama	Wetland lake complex	Rascafría	19/05/2014	1	8.90	2.00	6.7	0.15	2.50	0.05	0.10	7	
Guadarrama	Big lake	Rascafría	19/05/	1	8.90	2.00	6.9	0.05	2.50	0.05	0.10	7	

	of Peñalara		2014										
Guadarrama	River Manzanares	Manzanares El Real	02,05,08,11/2014	4	10.13	2.00	7.25	0.07	2.5	0.05	0.10	7	
Guadarrama	River Navalmedio	Cercedilla	02,05,08,11/2014	4	9.98	2.00	7.5	0.05	2.5	0.05	0.10	7	
Guadarrama	River Moros	El Espinar	2014 (P Total 2013)	12?	10.59	1	7.31	0.02	0.83		0.03	6	
Guadarrama	Dam of Peces	Navas de Riofrío	2014	5	9.205	1.00	7.98	0.03	0.32	0.02	0.05	7	
Guadarrama	River Frío	Real Sitio de San Ildefonso	2014	12?	8.69	1.00	7.19	0.03	0.60		0.05	6	
Guadarrama	River Eresma	Real Sitio de San Ildefonso	2014	12?	8.80	1.00	7.38	0.13	1.7		0.03	6	
Guadarrama	River Cambrones	Real Sitio de San Ildefonso	2013	12?	8.85	1.00	7.38	0.09	2.7		0.24	6	
Guadarrama	Dam of Torrecaballeros	Santo Domingo de Pirón	2014	5	9.24	1.00	7.07	0.02	0.75	0.015	0.04	7	<b>2</b>

## 1.6. Health of vegetation

- Both NPs

Ordesa NP								
Zone	Species	n	Average defoliation 2015 (%)	Average decoloration 2015 (%)	Average defoliation 2013 (%)	Average decoloration 2013 (%)	Average defoliation 2012 (%)	Average decoloration 2012 (%)
NP	<i>Fagus sylvatica</i>	24	26.88	0	24.79	0	23.75	0.42
NP	<i>Pinus uncinata</i>	24	21.46	0	17.92	0	25.83	0.04
NP	<i>Pinus sylvestris</i>	24	22.29	0	21.88	0	25	0.17
PPZ	<i>Pinus sylvestris</i>	24	23.33	0	21.46	0	21.46	0
PPZ	<i>Pinus sylvestris</i>	24	22.92	0	22.71	0	23.54	0.04
		Value	1	2				
		VALUE	1					

Guadarrama NP											
Province	Zone	Species	n	Average defoliation 2015 (%)	Average decoloration 2015 (%)	Average defoliation 2014 (%)	Average decoloration 2014 (%)	Average defoliation 2013 (%)	Average decoloration 2013 (%)	Average defoliation 2012 (%)	Average decoloration 2012 (%)
Segovia	PN	<i>Pinus sylvestris</i>	12	29.00	0.00	29.60	0.00	No data	No data	No data	No data
Segovia	ZPP	<i>Pinus sylvestris</i>	12	23.10	0.00	23.30	0.00	No data	No data	No data	No data

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Segovia	ZPP	<i>Pinus sylvestris</i>	12	18.80	0.00	18.10	0.00	No data	No data	No data	No data
Segovia	ZPP	<i>Pinus sylvestris</i>	12			19.60	0.00	No data	No data	No data	No data
Segovia	ZPP	<i>Pinus sylvestris</i>	12			18.30	0.00	No data	No data	No data	No data
Segovia	ZPP	<i>Pinus sylvestris</i>	12			21.30	0.00	No data	No data	No data	No data
Segovia	ZPP	<i>Pinus sylvestris</i>	12			22.70	0.00	No data	No data	No data	No data
Average Segovia				23.63	0.00	21.84	0.00	No data	No data	No data	No data
Madrid	PN	<i>Pinus sylvestris</i>	30	14.00	0.00	13.83	0.00	13.50	0.00	13.67	0.00
Madrid	ZPP	<i>Quercus pyrenaica</i>	30	17.17	0.00	16.83	0.00	16.83	0.00	17.00	0.00
Madrid	ZPP	<i>Quercus pyrenaica</i>	30	21.50	0.00	23.00	0.00	25.33	0.00	31.83	0.07
Madrid	ZPP	<i>Quercus pyrenaica</i>	30	21.17	0.00	20.50	0.00	21.00	0.00	23.33	0.00
Madrid	PN	<i>Pinus sylvestris</i>	30	13.00	0.00	13.00	0.00	13.00	0.00	13.33	0.00
Madrid	ZPP	<i>Pinus sylvestris</i>	30	14.33	0.00	13.83	0.00	13.83	0.00	13.83	0.00
Madrid	ZPP	<i>Quercus pyrenaica</i>	30	27.83	0.00	27.67	0.00	32.00	0.27	37.83	0.27
Madrid	ZPP	<i>Pinus sylvestris</i>	30	15.00	0.00	15.00	0.00	14.50	0.00	14.00	0.00
Madrid	PN	<i>Pinus sylvestris</i>	30	13.50	0.00	13.33	0.00	13.00	0.00	16.00	0.13
Madrid	ZPP	<i>Quercus</i>	30	18.50	0.00	19.00	0.00	22.67	0.13	23.50	0.30



Fine-tuning of a protected area effectiveness evaluation tool: implementation on two emblematic Spanish National Parks

		<i>pyrenaica</i>									
Madrid	ZPP	<i>Pinus sylvestris</i>	30	14.17	0.00	13.83	0.00	14.33	0.00	14.50	0.00
Madrid	ZPP	<i>Fraxinus angustifolia</i>	30	31.50	0.00	32.50	0.00	40.67	0.10	53.33	0.00
Madrid	ZPP	<i>Pinus nigra</i>	30	15.33	0.00	15.33	0.00	15.67	0.00	16.67	0.00
Madrid	ZPP	<i>Pinus sylvestris</i>	30	17.67	0.00	17.00	0.00	16.33	0.00	18.83	0.00
Madrid	PN	<i>Pinus sylvestris</i>	31	13.50	0.00	13.50	0.00	13.83	0.00	14.17	0.00
Average Madrid				<b>17.88</b>	<b>0.00</b>	<b>17.88</b>	<b>0.00</b>	<b>19.10</b>	<b>0.03</b>	<b>21.46</b>	<b>0.05</b>
TOTAL NP				18.84	0.00	19.14	0.00				
<b>TOTAL NP 2014-15</b>						<b>18.99</b>	<b>0.00</b>				
			Value	1	2						
			<b>VALUE</b>	<b>1</b>							

## 2. PLANNING

### 2.1. Appropriateness of protection legislation

- Both NPs

National Park	Designated after 27/03/1989	Updated network plan	VALUE
Ordesa	No	Yes (2016)	1
Guadarrama	Yes	Yes (2016)	2

#### References:

Spanish Government. 1982. Ley 52/1982, de 13 de Julio, de reclasificación y ampliación del Parque Nacional de Ordesa y Monte Perdido. *Boletín Oficial del Estado*, 131: 20627-20629.

Spanish Government. 2013. Ley 7/2013, de 25 de junio, de declaración del Parque Nacional de la Sierra de Guadarrama. *Boletín Oficial del Estado*, 152: 47795-47852.

Spanish Government. 2016. Real Decreto 389/2016, de 22 de octubre, por el que se aprueba el Plan Director de la Red de Parques Nacionales. *Boletín Oficial del Estado*, 257: 74051-74076.

### 2.2. Existence of updated management plan

- Both NPs.

National Park	Management plan	Updated	VALUE
Ordesa	Yes	Yes (passed in 2015, with 10-year validity)	2
Guadarrama	No		0

#### References:

Government of Aragon. 2015. Decreto 49/2015, de 8 de abril, del Gobierno de Aragón, por el que aprueba el Plan Rector de Uso y Gestión del Parque Nacional de Ordesa y Monte Perdido. *Boletín Oficial de Aragón*, 80: 13026-13028.

### 2.3. Existence of updated socioeconomic plan

- Both NPs

National Park	Plan/Programme/ Guidelines	Individual plan/programme	Updated	VALUE
Ordesa	Yes	No (in management	Yes (management	2

		plan: headings 10.7.1 & 10.7.2)	plan passed in 2015, with 10-year validity)	
Guadarrama	Yes	No (in natural resources plan: headings A.2.10 & A.3.9)	Yes (natural resources plan passed in 2009-10, with unlimited validity)	2

## References:

Government of Madrid. 2009. DECRETO 96/2009, de 18 de noviembre, del Consejo de Gobierno, por el que se aprueba la ordenación de los recursos naturales de la Sierra de Guadarrama en el ámbito territorial de la Comunidad de Madrid. *Boletín Oficial de la Comunidad de Madrid*, 11: 4-131.

Government of Castilla y León. 2010. DECRETO 4/2010, de 14 de enero, por el que se aprueba el Plan de Ordenación de los Recursos Naturales del Espacio Natural «Sierra de Guadarrama» (Segovia y Ávila). *Boletín Oficial de Castilla y León*, 12: 3517-3590.

Government of Aragon. 2015. Decreto 49/2015, de 8 de abril, del Gobierno de Aragón, por el que aprueba el Plan Rector de Uso y Gestión del Parque Nacional de Ordesa y Monte Perdido. *Boletín Oficial de Aragón*, 80: 13026-13028.

## 3. MANAGEMENT

### 3.1. Degree of fulfilment of management objectives

- Ordesa NP

A meaningful way of evaluating this indicator according to existing data could be found for Ordesa NP. Existing data included either expenditure data on management actions or numerous, multi-year management measures aggregated in different manners.

- Guadarrama NP

Data to evaluate this indicator could not be retrieved.

### 3.2. Effectiveness of public participation bodies

- Both NPs

National Park	Public participation body	Meetings/year	Year (number of meetings)	VALUE
Ordesa	Patronato	1,75	2012(1), 2013(2), 2014(2), 2015(2)	<b>2</b>
Guadarrama	Patronato (establishment date 09/06/2014)	1	2014(1), 2015(1)	<b>1</b>

## References:

MAGRAMA. 2012, 2013, 2014, 2015. *Memoria de la Red de Parques Nacionales 2012, 2013, 2014, 2015*. Organismo Autónomo Parques Nacionales. Madrid.

### 3.3. Existence of sufficient management staff

National Park	Staff	Density (workers/10 <sup>3</sup> ha)	Value	Surveillance	Value	VALUE
Ordesa	35 (2015)	2,24	0	7 days / week	2	<b>1</b>
Guadarrama						

No data could be retrieved for Guadarrama NP.

### 3.4. Existence of environmental education and volunteering activities

- Ordesa NP
  - Environmental education activities: Education programme in schools of the socioeconomic influence zone; guided tours to visitors.
  - Environmental volunteering activities: 3 actions within the National Park Environmental Volunteering Programme by ACA, Asociación Herpetológica Española and Cruz Roja Española.
- Guadarrama NP
  - Environmental education activities (2014 and 2015): Environmental education programmes in visitor centres (peripheral areas, local schools, free entrance to schoolchildren, promotion of sustainable economy in the peripheral zone, Nature

Train, National Park's Bus, Meeting Point, CENEAM summer walks & CENEAM didactic walks around Valsáin)

- Environmental volunteering activities (2014): Environmental volunteering in visitor centres; support to global change monitoring in mountain freshwater ecosystems (by ACA); International work camp by Youth Directorate General; Virtual biodiversity in PAs of the Region of Madrid.

## References:

MAGRAMA. 2014, 2015. *Memoria de la Red de Parques Nacionales 2014, 2015*. Organismo Autónomo Parques Nacionales. Madrid.

## 4. SOCIOECONOMIC CONTEXT

### 4.1. Local population density

- Ordesa NP

Province	Municipality	Area (km <sup>2</sup> )	Population 2015	Population 2016	VALUE
Huesca	Bielsa	202.41	488	483	
Huesca	Broto	128.50	532	532	
Huesca	Fanlo	187.10	112	107	
Huesca	Puértolas	99.86	207	213	
Huesca	Tella-Sin	90.33	249	243	
Huesca	Torla	185.21	306	305	
<b>Huesca</b>	<b>TOTAL PN</b>	<b>893.41</b>	<b>1,894</b>	<b>1,883</b>	
	<b>Ordesa</b>				
	<b>Densidad PN</b>		<b>2.12</b>	<b>2.11</b>	<b>0</b>
	<b>Ordesa</b>				

- Guadarrama NP

Province	Municipality	Area (km <sup>2</sup> )	Population 2015	Population 2016	VALUE
Madrid	Alameda del Valle	25.72	217	208	
Madrid	Becerril de la Sierra	30.53	5,396	5,439	
Madrid	El Boalo	39.45	7,157	7,225	
Madrid	Canencia	54.15	464	451	
Madrid	Cercedilla	35.74	6,781	6,751	
Madrid	Guadarrama	57.16	15,538	15,488	
Madrid	Lozoya	57.82	594	576	
Madrid	Manzanares el Real	126.83	8,309	8,387	
Madrid	Miraflores de la	56.41	5,807	5,754	

	Sierra				
Madrid	Los Molinos	19.17	4,349	4,373	
Madrid	Navacerrada	27.51	2,855	2,885	
Madrid	Navarredonda y San Mamés	28.48	136	132	
Madrid	Pinilla del Valle	25.42	200	192	
Madrid	Rascafría	149.23	1,739	1,692	
Madrid	Soto del Real	42.83	8,456	8,483	
	<b>TOTAL Madrid</b>	<b>776.46</b>	<b>67,998</b>	<b>68,036</b>	
Segovia	Aldealengua de Pedraza	35.06	83	82	
Segovia	Basardilla	19.04	137	143	
Segovia	Collado Hermoso	16.37	145	136	
Segovia	El Espinar	204.99	9,486	9,212	
Segovia	Gallegos	21.77	94	94	
Segovia	La Losa	27.99	535	533	
Segovia	Navafría	30.44	324	321	
Segovia	Navas de Riofrío	14.85	421	423	
Segovia	Ortigosa del Monte	15.41	547	552	
Segovia	Otero de Herreros	43.69	981	971	
Segovia	Palazuelos de Eresma	36.70	4,986	5,052	
Segovia	Real Sitio de San Ildefonso	144.84	5,403	5,352	
Segovia	Santiuste de Pedraza	29.12	111	104	
Segovia	Santo Domingo de Pirón	27.57	62	62	
Segovia	Segovia	163.50	52,728	52,257	
Segovia	Sotosalbos	23.91	118	115	
Segovia	Torrecañaballeros	42.23	1,288	1,299	
Segovia	Torre Val de San Pedro	44.26	196	190	
Segovia	Treccasas	32.67	1,007	1,055	
	<b>TOTAL Segovia</b>	<b>974.38</b>	<b>78,652</b>	<b>77,953</b>	
	<b>TOTAL SIZ Guadarrama</b>	<b>1750.84</b>	<b>146,650</b>	<b>145,989</b>	
	<b>Densidad SIZ Guadarrama (inh. / km<sup>2</sup>)</b>		<b>83.76</b>	<b>83.38</b>	<b>2</b>

#### 4.2. Land use changes

- Ordesa NP

No changes were detected in either the NP or its PPZ using Corine Land Cover data from 2006 and 2012 (Copernicus, 2016<sub>a,b</sub>).

- Guadarrama NP

Land use changes between 2006 and 2012 were not analysed because Guadarrama NP was designated in 2013.

## References:

- Copernicus Land Monitoring Services. 2016<sub>a</sub>. *Pan-European. Corine Land Cover. CLC 2006. 18.5 version*. Available online from: <http://land.copernicus.eu/pan-european/corine-land-cover/clc-2006/view> (Accessed 31/10/2016)
- Copernicus Land Monitoring Services. 2016<sub>b</sub>. *Pan-European. Corine Land Cover. CLC 2012. 18.5 version*. Available online from: <http://land.copernicus.eu/pan-european/corine-land-cover/clc-2012/view> (Accessed 17/10/2016).

## 5. SOCIAL PERCEPTION AND VALUATION

### 5.1. Degree of knowledge on the PA

- Ordesa NP

Ninety-nine point one per cent of the sample of local residents (n=111) knew about the NP.

- Guadarrama NP

Ninety-seven point seven per cent of the sample of local residents (n=260) knew about the NP.

### 5.2. Personal importance

- Ordesa NP

The NP is 'very important' or 'quite important' for 89.2% of residents.

- Guadarrama NP

The NP is 'very important' or 'quite important' for 82.4% of residents.

## 6. THREATS TO CONSERVATION

### 6.1. Fragmentation

- Ordesa NP

No increase in artificial covers either in the NP or in its PPZ was detected between 2006 and 2012 using Corine Land Cover Data (Copernicus, 2016<sub>a, b</sub>).

- Guadarrama NP

Natural and semi-natural habitat fragmentation between 2006 and 2012 was not analysed because Guadarrama NP was designated in 2013.

## References:

Copernicus Land Monitoring Services. 2016<sub>a</sub>. *Pan-European. Corine Land Cover. CLC 2006. 18.5 version*. Available online from: <http://land.copernicus.eu/pan-european/corine-land-cover/clc-2006/view> (Accessed 31/10/2016)

Copernicus Land Monitoring Services. 2016<sub>b</sub>. *Pan-European. Corine Land Cover. CLC 2012. 18.5 version*. Available online from: <http://land.copernicus.eu/pan-european/corine-land-cover/clc-2012/view> (Accessed 17/10/2016).

## 6.2. Density of alien invasive species

- Ordesa NP

In 2016, 10 alien invasive species were identified in the NP.

Family	Genus	Species
<i>Liliaceae</i>	<i>Asparagus</i>	<i>officinalis</i>
<i>Cruciferae</i>	<i>Bunias</i>	<i>orientalis</i>
<i>Juglandaceae</i>	<i>Juglans</i>	<i>regia</i>
<i>Leguminosae</i>	<i>Medicago</i>	<i>sativa</i>
<i>Rosaceae</i>	<i>Prunus</i>	<i>domestica</i>
<i>Rosaceae</i>	<i>Prunus</i>	<i>dulcis</i>
<i>Rosaceae</i>	<i>Pyrus</i>	<i>communis</i>
<i>Rosaceae</i>	<i>Rosa</i>	<i>gallica</i>
<i>Rubiaceae</i>	<i>Rubia</i>	<i>tinctorium</i>
<i>Salmonidae</i>	<i>Salvelinus</i>	<i>Fontinalis</i>
Number of AIS		10
Density of AIS (species / ha.)		6,4 x 10 <sup>-4</sup>
VALUE		0

- Guadarrama NP

Data to evaluate this indicator could not be retrieved.



### 6.3. Density of visitors

- Both NPs

National Park	Area (ha.)	Visitors 2014	Visitors 2015	Density 2014 (vis/ha)	Density 2015 (vis/ha)	VALUE
Ordesa	15,608	590,050	598,950	37.80	38.37	<b>1</b>
Guadarrama	33,960	2,941,636	2,989,556	86.62	88.03	<b>2</b>

### 6.4. Activities performed by visitors

- Ordesa NP

Hiking, bird-watching and mountaineering.

- Guadarrama NP

Data to evaluate this indicator could not be retrieved.

#### References:

Government of Madrid. 2009. DECRETO 96/2009, de 18 de noviembre, del Consejo de Gobierno, por el que se aprueba la ordenación de los recursos naturales de la Sierra de Guadarrama en el ámbito territorial de la Comunidad de Madrid. *Boletín Oficial de la Comunidad de Madrid*, 11: 4-131.

Government of Castilla y León. 2010. DECRETO 4/2010, de 14 de enero, por el que se aprueba el Plan de Ordenación de los Recursos Naturales del Espacio Natural «Sierra de Guadarrama» (Segovia y Ávila). *Boletín Oficial de Castilla y León*, 12: 3517-3590.

Spanish Government. 2014. Ley 30/2014, de 3 de diciembre, de Parques Nacionales. *Boletín Oficial del Estado*, 293: 99762-99792

Government of Aragon. 2015. Decreto 49/2015, de 8 de abril, del Gobierno de Aragón, por el que aprueba el Plan Rector de Uso y Gestión del Parque Nacional de Ordesa y Monte Perdido. *Boletín Oficial de Aragón*, 80: 13026-13028.

### 6.5. Climate change

- Ordesa NP

Climatic data come from Goriz meteorological station (2,200 masl).

For temperature, mean annual temperatures from monthly means in two consecutive periods of 18 years (1982-1999) and 17 years (2000-2016) were compared. Mean annual temperature increased by 0.35 °C between both periods.

Temperature (°C x 10)														
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Annual (°C)
1982	6	-2	-15	28	50	99	137	116	89	40	19	-10	46.42	4.64
1983	44	-37	19	-1	28	99	145	107	116	74	35	16	53.75	5.38
1984	-19	-33	-36	44	11	90	147	103	85	55	20	-5	38.50	3.85
1985	-59	16	-26	23	32	90	135	130	130	75	1	24	47.58	4.76
1986	-27	-38	8	-16	71	99	129	125	104	69	34	0	46.50	4.65
1987	-24	-20	-7	28	42	85	114	143	122	45	19	33	48.33	4.83
1988	-8	-19	4	23	50	69	124	134	101	73	36	23	50.83	5.08
1989	8	-8	35	-9	68	94	139	134	87	78	22	9	54.75	5.48
1990	4	35	15	1	59	97	141	132	105	54	5	-13	52.92	5.29
1991	-16	-22	21	4	31	95	137	155	102	30	20	18	47.92	4.79
1992	-4	12	3	22	69	53	123	131	90	24	54	5	48.50	4.85
1993	46	-19	4	9	47	98	122	132	61	10	17	11	44.83	4.48
1994	-11	-17	55	-2	57	104	157	151	65	54	52	22	57.25	5.73
1995	-22	16	12	41	32	89	142	131	65	69	28	-5	49.83	4.98
1996	-11	-32	4	27	54	90	121	109	77	62	16	-6	42.58	4.26
1997	-12	37	45	51	52	75	107	124	107	75	7	-6	55.17	5.52
1998	-5	39	34	-5	53	105	139	140	87	54	10	10	55.08	5.51
1999	2	-15	6	17	71	96	134	129	92	55	2	5	49.50	4.95
Mean period 1	4.95													
2000	-4	28	17	5	72	113	113	131	109	51	-6	-2	52.25	5.23
2001	-21	0	21	18	66	123	121	140	88	75	9	5	53.75	5.38
2002	16	12	21	35	45	122	122	110	84	61	15	4	53.92	5.39
2003	-27	-35	34	33	70	140	140	155	95	40	35	-1	56.58	5.66

2004	0	6	-8	9	52	118	123	124	115	58	31	-4	52.00	5.20
2005	3	-52	3	16	77	130	143	128	97	57	10	-6	50.50	5.05
2006	-10	-5	10	41	78	117	149	113	105	78		14	62.73	6.27
2007	19	12	4	50	70	93	126	124	103	56	34	-2	57.42	5.74
2008		25	-9	12	35	79		119	75	42	-11	-15	35.20	3.52
2009	-24	-6	15	24	87	109	135	143	96	84	24	-10	56.42	5.64
2010	-31	-42	-12	32	38	89	150	136	94		-7	-18	39.00	3.90
2011	-8	4	1	64	80	101	112	139	119	77	35	13	61.42	6.14
2012	14	-43	23	2	76	118	128	152	101	59	20	6	54.67	5.47
2013	-7	-45	-12	20	27	84	132	130	104	71	5	22	44.25	4.43
2014	-10	-24	12	50	49	97	114	117	110		24		53.90	5.39
2015	-9	-44	19	41	79	112	164	127	83	59	55	49	61.25	6.13
2016	-3	-6	-12	18	46	105	142	152	111	72	16	38	56.58	5.66
Mean period 2	5.30													
<b>Value</b>	<b>1</b>													

For the analysis of precipitation, total precipitation in August for two consecutive periods of 20 years (1976-1999) and 17 years (2000-2016) were compared. The month of August was chosen because it had the most complete time series for the whole period. Mean precipitation in August decreased by 34% in both periods.

Year	Precipitation in August (mm)
1976	2,099
1981	779
1982	1,630
1983	1,784
1984	1,175
1985	130
1986	270
1987	1,148
1988	770
1989	1,030
1990	930
1991	
1992	2,680
1993	1,781
1994	950
1995	985
1996	1,659
1997	3,072
1998	1,161
1999	1,048
<i>Mean Period 1</i>	<i>1,320</i>
2000	706
2001	723
2002	1,799
2003	447
2004	408
2005	1,062
2006	621
2007	2,102
2008	115
2009	1,145
2010	
2011	1,189
2012	566
2013	610

2014	1,274
2015	
2016	266
<i>Mean Period2</i>	869
<b>Value</b>	<b>2</b>

- Guadarrama NP

Data to evaluate this indicator could not be retrieved

#### 6.6. Pasture encroachment by woody vegetation (specific indicator for Ordesa NP)

No changes in Corine Land Cover sub-classes 231 or 321 between 2006 and 2012 were detected.

#### References:

- Copernicus Land Monitoring Services. 2016<sub>a</sub>. *Pan-European. Corine Land Cover. CLC 2006. 18.5 version*. Available online from: <http://land.copernicus.eu/pan-european/corine-land-cover/clc-2006/view> (Accessed 31/10/2016)
- Copernicus Land Monitoring Services. 2016<sub>b</sub>. *Pan-European. Corine Land Cover. CLC 2012. 18.5 version*. Available online from: <http://land.copernicus.eu/pan-european/corine-land-cover/clc-2012/view> (Accessed 17/10/2016).