1. IDENTIFICATION

Name of the wetland	S'Albufera de Mallorca	ALBUFERA DE MALLORCA PARC NATURAL
Province/Department	Illes Balears	
Municipalities	Muro, Sa Pobla, Alcudia	
Latitude	39° 47' 25 " N	
Longitude	3° 5' 55" E	
Altitude (m)	-3 / 12 m.	
Wetland area (ha)	1800 ha. (1687,65 ha. Natural Park).	
Name of the catchment area	North & central Mallorca	
Catchment area surface (km ²)	640	
Please attach a map		

2. DESCRIPTION

General description of the wetland

S'Albufera, the largest and most important wetland area in the Balearics, is a former lagoon separated from the sea by a belt of dunes, which for many centuries – but especially in the last two as a result of human influence – has filled up with sediments converting it into an extensive flood plain. S Albufera traces its origins back some 18 million years, but the present wetland was formed less than 100,000 years ago. The current sea dunes are even more recent, being around 10,000 years old.

The Natural Park affords protection to some 1709 hectares of marshes and dunes. The area is flat and just above sea level. The boundaries comprise the sea, tourist urbanisation and agricultural land. An inland band of stabilised dunes partially interrupts the wetland. S'Albufera is part of Sa Pobla Plain, a 30-40 m thick layer of quaternary sediments. It has a typical Mediterranean climate, though somewhat milder and with a slightly higher rainfall than the surrounding area.

General hydrological and physical characteristics of the wetland (water permanency, salinity, quality...)

The marsh is situated on thick layers of marine sediments. It gets its water from surface runoff and groundwater. There is a system of dykes and drainage canals, remaining from attempts to convert the wetland into irrigated agricultural fields. S ´Albufera derives a large part of its water from rain falling on some 640 square kilometres of north and central Mallorca by way of seasonal streams ("torrents") and springs from subterranean aquifers, known as "ullals". A relatively small amount of seawater intrusion in summer nevertheless has a particular effect on the vegetation and fauna.

Flora of the wetland (main species and vegetation communities)

The dominant plants in the zones of freshwater inundation are reed (*Phragmites australis*) and saw-sedge (*Cladium mariscus*), with reedmace (*Typha latifolia*) the most important large emergent plant in canals and other open water. Reed also dominates in some of the more brackish areas, but in seasonally flooded areas is largely replaced by salt marsh vegetation dominated by *Sarcocornia* and *Arthrocnemum* species. Submerged vegetation in saline pools is restricted to occasional communities of *Ruppia*. A much higher diversity of submerged macrophytes live in the freshwater canals, small lagoons (known as 'Ilisers') and flooded marshes. The most abundant is fennel pondweed (*Potomogeton pectinatus*). Other notable macrophytes include spineless hornwort (*Ceratophyllum submersum*), duckweeds (*Lemna sp.*) and a number of wetland species not known elsewhere in the Balearic Islands; while over 60% of the known Spanish charophyte species Characeae have been recorded. S'Albufera is the only Balearic location for the marsh orchid *Orchis palustris*, found in open areas of seasonally grazed marsh. Woodland is mainly riverine, alongside the canals, with white poplar (*Populus alba*), and elm (*Ulmus x hollandica*) the major species except in more brackish areas where open tamarisk (*Tamarix* sp.) woodland occurs. In the cosatal dunes the most representative species are: *Juniperus oxycedrus macrocarpa* and *Thymelaea myrtifolia*

We must not overlook the wide variety of fungi recorded: 66 species so far. One of these, the toadstool *Psathyrella halophila*, was discovered new to science in 1992 and is still only known from S'Albufera. Early studies suggest it is associated with dead *Cladium mariscus* material. Another notable fungus is *Marasmiellus caesioater*. This is an Argentinian species not previously recorded in Europe. Despite its rare status in Europe the species is widespread in the reedbeds, growing on dead and dying *Phragmites* stems just above the ground or water surface.

Fauna of the wetland (main species; if known, give an indication of numbers or abundance for noteworthy species)

The number and diversity of invertebrates is enormous. The most notable groups are the dragonflies, flies (including endemic species), spiders and, above all, the moths – of which more than 300 species are currently known. These include increasing numbers of species moving north from Africa, some of which are thought to be breeding in the Park. Invertebrate studies are demonstrating that s'Albufera is of high conservation importance for rare or little known invertebrate species. For instance recent research has demonstrated that s'Albufera supports strong populations of the footman moth *Pelosia plumosa*, known previously from just a handful of records in a very few other Mediterranean wetlands, while an as yet undescribed Noctuid, previously known from 7 West African records, is encountered annually at s'Albufera.

We can also note the wealth of fish: 29 species, the majority marine in origin. The most numerous are the eel (*Anguilla anguilla*) and a variety of mullet species. Among the amphibians the marsh frog (*Rana perezi*) population is large, and plays a pivotal role in the ecology of the marsh, both as predator and prey item. Reptiles include strong populations of the water snake (*Natrix maura*) and European pond terrapin (*Emys orbicularis*, >500 - listed on Annex II of Council Directive 79/409/EEC).

The most abundant mammals are the rodents (rats and mice) and bats (8 species listed on Annex II of Council directive 92/43/EEC): *Barbasterella barbastrellus*, *Myotis capaccini, Miniopterus schreibersi, Myotis emarginatus, Myotis myotis, Rhinolophus ferrum-equium, Rhinolophus hipposideros and Rhinoluphus mehelyi.* Other mammals: *Mus spretus, Erinaceus algirus. Mustela nivalis, Martes martes, Lepus granatensis,...*

S Albufera is famous for its birds. It is the only site in the archipelago where over two-thirds the total number of species recorded in the Balearics have been seen – some 200 different species.

The 61 species breeding in the Park comprise both sedentary species and summer migrants. It has internationally important breeding populations (listed on Annex I of Council Directive 79/409/EEC) of *Ardea purpurea* (80-110 pairs), *Ixobrychus minutus* (>50 pairs), *Nycticorax nycticorax* (80 p.), *Ardeola ralloides* (4-5 p.), *Botaurus stellaris* (5-6 booming males), *Circus aeruginosus* (10-12 pairs), *Porphyrio porphyrio* (250+ individuals, following a hugely successful re-introduction in 1991), *Himantopus himantopus* (130-150 pairs) and *Acrocephalus melanopogon* (>1500 pairs; S'Albufera reedbeds hold the highest known mustached warbler densities in the World, with a very conservative estimate of 1500 pairs in c500 ha of suitable old growth reed habitat), *Calandrella brachidactila* (11-15 p), *Burhinus oedicnemus* (10-15 p.), *Oxyura leucocephala* (1-2 p. re-introduction in 1993) and *Anthus campestris* (1-2 p).

Other breeding species are: *Tachybaptus ruficollis* (101-250 pairs), *Rallus aquaticus* (101-250 p), *Egretta garzetta* (30 p.), *Ardea cinerea* (1-5 p), *Bubulcus ibis* (1-5 p), one pair of marbled ducks *Marmaronetta angustirostris* has bred in the last two years, *Netta rufina* (11-50 p. re-introduction in 1991), *Aythya fuligula* (11-50 p), *Sylvia atricapilla* (11-50 p), Merops apiaster (11-50 p.), *Otus scops* (11-50 p).

Pandion haliaetus and Falco eleonorae feed in the area during the breeding season.

Types of wetland habitats	
Habitats Directive types	Surface %
1150 *Coastal lagoons	
1310 Salicornia and other annuals colonizing mud and sand	
1410 Mediterranean salt meadows (Juncetalia maritimi)	
1420 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	
1510 * Mediterranean salt steppes (Limonietalia)	
2110 Embryonic shifting dunes	
2120 Shifting dunes along the shoreline with Ammophila arenaria ('white dunes')	
2210 Crucianellion maritimae fixed beach dunes	
2230 Malcolmietalia dune grasslands	
2250 * Coastal dunes with <i>Juniperus</i> spp.	3,6

2260 <i>Cisto-Lavenduletalia</i> dune sclerophyllous scrubs	
3150 Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> – type vegetation	
3280 Constantly flowing Mediterranean rivers with <i>Paspalo-Agrostidion</i> species and hanging curtains of <i>Salix</i> and <i>Populus alba</i>	
5333	
5334	
7210 * Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>	
92A0 Salix alba and Populus alba galleries	
*** Categories and extent of CORINE biotopes in S'Albufera	Surface %
Fen-sedge (Cladium mariscus) beds / CORINE Code 53.31	49
Flooded Phragmites beds / 53.111	24
Dry Phragmites beds / 53.112	10
Giant Phragmites beds / 53.113	4
Mediterranean tall rush salt marshes / 15.51	1
Mediterranean salt scrubs / 15.61	1
Mediterranean halo-psammophile meadows / 15.53	0,5
Open water communities:	(10.5)
Chara carpets / 22.441	5
Small Potamogeton communities / 22.422	2.5
Ruppia communities of brackish and salt waters / 23.211	2.5
Eutrophic waters / 22.13	0.5
Ramsar Convention types:	Surface %
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9	Surface %
Ramsar Convention types: Principals: E, H, Tp, O, P, Ts, 5, 9 Permanent shallow marine waters less than six metres deep (A)	Surface % n.a.
Ramsar Convention types: Principals: E, H, Tp, O, P, Ts, 5, 9 Permanent shallow marine waters less than six metres deep (A) Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)	Surface % n.a. <1
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).	Surface % n.a. <1
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.	Surface % n.a. <1
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)	Surface % n.a. <1 3,6 <1 <1 15
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)Coastal brackish and saline lagoons (J)	Surface % n.a. <1
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)Coastal brackish and saline lagoons (J)Coastal freshwater lagoons (K)	Surface % n.a. <1 3,6 <1 15 n.a. n.a
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)Coastal brackish and saline lagoons (J)Coastal freshwater lagoons (K)Permanent freshwater marshes/pools (Tp)	Surface % n.a. <1 3,6 <1 5 15 n.a. n.a n.a n.a
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)Coastal brackish and saline lagoons (J)Coastal freshwater lagoons (K)Permanent freshwater marshes/pools (Tp)Permanent saline, brackish and alkaline marshes and pools (Sp)	Surface % n.a. <1 3,6 <1 15 n.a. n.a. n.a n.a. n.a. n.a.
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)Coastal brackish and saline lagoons (J)Coastal freshwater lagoons (K)Permanent freshwater marshes/pools (Tp)Permanent saline, brackish and alkaline marshes and pools (Sp)Seasonal saline, brackish and alkaline marshes and pools (Ss)	Surface %
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)Coastal brackish and saline lagoons (J)Coastal freshwater lagoons (K)Permanent freshwater marshes/pools (Tp)Permanent saline, brackish and alkaline marshes and pools (Sp)Seasonal saline, brackish and alkaline marshes and pools (Ss)Non-forested alkaline fen (Type U)	Surface %
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)Coastal brackish and saline lagoons (J)Coastal freshwater lagoons (K)Permanent freshwater marshes/pools (Tp)Permanent saline, brackish and alkaline marshes and pools (Sp)Seasonal saline, brackish and alkaline marshes and pools (Ss)Non-forested alkaline fen (Type U)Freshwater springs (Y).	Surface % n.a. <1
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)Coastal brackish and saline lagoons (J)Coastal freshwater lagoons (K)Permanent freshwater marshes/pools (Tp)Permanent saline, brackish and alkaline marshes and pools (Sp)Seasonal saline, brackish and alkaline marshes and pools (Ss)Non-forested alkaline fen (Type U)Freshwater springs (Y).Seasonally flooded agricultural land (managed & grazed wet pastures) (4)	Surface % n.a. <1
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)Coastal brackish and saline lagoons (J)Coastal freshwater lagoons (K)Permanent freshwater marshes/pools (Tp)Permanent saline, brackish and alkaline marshes and pools (Sp)Seasonal saline, brackish and alkaline marshes and pools (Ss)Non-forested alkaline fen (Type U)Freshwater springs (Y).Seasonally flooded agricultural land (managed & grazed wet pastures) (4)Salt pans (not in use) (5)	Surface %
Ramsar Convention types:Principals: E, H, Tp, O, P, Ts, 5, 9Permanent shallow marine waters less than six metres deep (A)Marine subtidal aquatic beds, of the sea grass <i>Posidonia oceanica</i> (B)Sand shores, comprising 1.5 km of a 10 km shell sand beach, backed by a 0.5 km wide band of coastal dune which began to form about 10,000 years ago (E).Rocky marine shore habitat (D) is simulated by stone block banks to the canalised connection between marsh and sea.Salt marshes (H)Coastal brackish and saline lagoons (J)Coastal freshwater lagoons (K)Permanent freshwater marshes/pools (Tp)Permanent saline, brackish and alkaline marshes and pools (Sp)Seasonal saline, brackish and alkaline marshes and pools (Ss)Non-forested alkaline fen (Type U)Freshwater springs (Y).Seasonally flooded agricultural land (managed & grazed wet pastures) (4)Salt pans (not in use) (5)Canals and drainage channels, ditches (9)	Surface % n.a. <1

3. VALUES	
Ramsar criteria	Importance ¹
Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.	2
Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.	4
Criterion 3: A 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.	4
Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions	4
Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.	3
Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.	3
Criterion 7: A wetland should be considered internationally important if it supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity.	3
Criterion 8: A wetland should be considered internationally important if it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.	2
Values of the wetland (see annex)	Importance ¹
101 Ground water recharge	3
102 Ground water discharge	4
103 Flood control	4
104 Sediment/toxicant retention	1-2
105 Nutrient retention	3
106 Shoreline stabilisation	3
108 Water transport	2
109 Food chain support	4
110 Wildlife habitat	4
111 Active recreation	4
201 Wildlife resources	2
204 Agricultural resources	2
205 Water supply (in the boundaries)	3
206 Forest resources	2
301 Biological diversity	4
302 Uniqueness to culture/heritage	4

¹ Importance: **1** - Insufficient information; **2** - Low; **3** - Moderate; **4** - High

4. STATUS	
Land ownership	Surface %
State	23,5
Region	49,5
Province / Department / Island Council	-
Municipality	5
Common land	-
Private	22
Others (please specify)	

Rights (of use, access...)

Figure(s) of protection (national)		Year of designation	Surface %
Natural Park (1709 Ha)		1988	100
Natural Area of special interest (1900 Ha).		1991	100
International designations		Year of designation	Surface %
Natura 2000 SPA/ZEPA		1987	100
Natura 2000 SCI/LIC prop	osed 07/2000		100
Ramsar site		1989	100
World Heritage site			
Mediterranean SPA (Barcelona Convention)			
Biosphere Reserve			
Others (specify)			
Council of Europe Biogenetic Reserve		1996	100

5. MANAGEMENT INFORMATION

Management plan:	Yes	Period: 1998-2002
Director-manager:	Yes	Name: Juan Salvador Aguilar Gonzalez
Technical staff:	Yes	Number: ¹

Estate management staff: No	Number:
Visitor/ education staff: Yes	Number: ¹⁻²
Wardens: Yes	Number: (1 chief warden)
Other (specify): Naturalist/vegetation management	Number: ^{1/2}
Maintenance	Number: 4 + 1 chief
Information (visitors managers)	Number: ³

Monitoring programmes	Yes / No	Year of start	Frequency / Comments
Birds	Yes	1989	Daily - Weekly – Monthly - Annually
Mammals	Yes	1989	Annually by TAIB
Amphibians/Reptiles	No		
Fish	No		
Invertebrates	Yes	1989	Annually by TAIB
Flora	Yes	1989	Annually by TAIB
Vegetation	Yes	1989	Annually by TAIB
Water levels	No	1990	Monthly (1990-1998)
Water salinity	Yes	1994	Monthly by park staff
Water quality (NO ₃ , PO ₄)	Yes	2001	Monthly
Water quality (pesticides, heavy metals)	Yes	2000	Occasionally
Visitors	Yes	1986	Daily by park staff
Grazing	Yes	1989	Monthly by park staff / Annually by TAIB
Field laboratory	Yes	2000	
Other (specify):			
Global biodiversity monitoring program	Yes	1989	Park Staff & TAIB
* TAIB : TI	ne Albufera II	nternational	Biodiversity Group

Information/Education/Interpre- tation services and facilities	Yes / No	Year of start	Comments
Guided tours for schools	Yes	1987	5000 students/year aprox.
Guided tours for general public	Yes	1999	
Nature trails (indicate number)	3	1987	One in the dune area
Observation hides/towers (ind. number)	8	1987	
Visitors/interpretation centre (number)	1	1987	125.000 visitors/ in 2000
Exhibitions (indicate number)	1	1993	
Activity room (e.g. for schools)	Yes	1989	
Audiovisuals (video, slide show)	Yes	1993	20 pax.
Leaflets, maps	Yes	1988	
Books, publications	Yes	1987	
CD-ROM	Yes	1995	
Web site (give address)	Yes	1996	http://www.mallorcaweb.net/salbufera
Other (specify)			

6. SOCIO-ECONOMIC ACTIVITIES

Agriculture (indicate the importance, the area of influence and the impacts caused, real or potential)

A wide expanse of land immediately outside the borders of the park, particularly to the west on the Sa Pobla plain, is utilised for arable cultivations. Organic soils, a readily accessible aquifer for irrigation and a virtually frost free climate combine to make this the zone of most intensive agriculture in Mallorca. A wide range of crops is grown, but particularly potatoes, and up to 3 or more crops are harvested each year. This is achieved by repeated application of nitrate-based fertilisers and other agricultural chemicals.

Surface runoff and entry into the aquifer shared by s'Albufera impacts water quality in the Park, leading to eutrophication and the loss of biodiversity - initially of submerged macrophytes and charophytes, then other parts of the ecological chain. Slow movement of water through the Park is part of the natural hydrological system and important for the marshland ecology. Slow movement does however compound the problem of eutrophication (although this is partially countered by the natural "cleansing" activities of large emergent macrophytes such as *Typha* and *Phragmites*).

The biggest impact is on the open areas, such as canals entering the Park. Studies indicate that some macrophyte species have already been lost, and levels of nitrates in some areas of open water exceed recommended European limits.

Grazing (indicate the importance, the area of influence and the impacts caused, real or potential)

Traditionally the marshes of s'Albufera were used for extensive stock grazing. With the declaration of the Park, adjustments were made in the grazing regime but not stopped completely. Grazing was continued partly to maintain the tradition and culture (including the use of an endemic local race of cattle) but primarily as a conservation tool. The objective became to keep certain areas of marsh open through grazing, to increase habitat diversity, to benefit waterfowl and to replicate some of the landscape and biotope features, such as lagoons, which existed prior to attempts at drainage in the 19th century.

The use of grazing stock, mainly cattle, horses and a small experimental herd of buffalo, has been largely successful in achieving this objective. However, experience has taught us that careful manipulation of numbers, species, and locations in relation to time of year is essential to obtain maximum benefit from this form of conservation management; and without discrimination for these factors, grazing can be detrimental to some important elements of biodiversity.

Studies have shown for instance that horses, especially, and cattle can benefit the marsh orchid *Orchis palustris* population by creating the open reedbed structure the orchid requires – but only if the plant itself is not subject to grazing during the pre-flowering period. This means that for best effect, grazing should be applied during the period June-December, then withdrawn until after the orchids have flowered.

Based on experience and studies, the Park has adjusted its grazing programme to take into account the need for finer discrimination. The results of this adjustment will be monitored in order to guide future conservation management using stock animals.

Fishing (indicate the importance, the area of influence and the impacts caused, real or potential)

Fishing within the Park is restricted to a small, regulated eel (*Anguilla anguilla*) fishery and seasonal rod and line fishing, mainly for mullet (Mugilidae), at specified locations. These activities are all carried out under licence, regulated by the Park. A low level of poaching occurs, but vigilance by Park guards keeps it under control. At current levels, poaching is not considered an impact on the Park's fish stocks.

S'Albufera is famous for its eels, and the Park was very keen to ensure that this tradition was maintained by allowing local individuals involved in the fishery to continue their activities, using traditional methods of capture. The establishment of a regulated fishery had one important, unexpected value. It provided good data on eel stock levels. This demonstrated that, in keeping with much of Europe, s'Albufera eel stocks had declined alarmingly. The reasons for this are not known, though declining water quality may be a factor. This is a real conservation issue, which may be beyond the control of the Park. However, as a precaution, the eel fishery has been suspended for the time being.

Hunting (indicate the importance, the area of influence and the impacts caused, real or potential)

Hunting is no longer permitted within the Park, though it continues along the Park periphery. Park policy has been to create habitats and enhance food supplies for waterfowl within the Park to reduce the numbers of duck and other species crossing Park borders where they run the gauntlet of hunters' guns. As a conciliatory gesture, Park staff co-operate with local hunters every autumn in clearing areas of reedbed outside the Park. This opens up areas for hunters wishing to hunt duck but at the same time allows any burn to be managed carefully to ensure that it does not cross over into the Park.

Tourism (indicate the importance, the area of influence and the impacts caused, real or potential)

S'Albufera is recognised as a very important asset for tourism in the north-east corner of Mallorca. The Park's international reputation attracts large numbers of birdwatchers, and other naturalists, especially in spring and autumn. This has lengthened the tourist season for local hotels and associated businesses.

Tourism, however, is not restricted to the bird migration seasons. Over 250,000 visitors are recorded every year, and the true number is likely to be even higher. The Park is open almost every day of the year and entry is free. Numbers are logged at the reception centre. Visitor numbers are particularly high on dull summer days unsuitable for sunbathing on the beach. High visitor numbers then reflect a curiosity about the Park but also probably indicate a lack of other attractions, and managed wildlife sites, in the general area.

The educational value of the Park is undoubted. However, high visitor numbers do bring their pressures. It has been calculated that visitors are concentrated on only 1% of the total Park area, as they are restricted to a network of tracks and paths. This means that impacts on the wildlife are generally localised and small. However, pressures are great on Park facilities and the challenge to staff of handling such a high numbers.

Industry (indicate the importance, the area of influence and the impacts caused, real or potential)

The only industrial plant of significance adjacent to the Park is the coal-fired power plant of Es Murterar, on the Park's northern boundary. Increased electricity demands on the island led to a doubling in size of the power plant in 1998. There are a number of impact issues related to this plant. There is a visual problem of coal dust, very evident on Park vegetation adjacent to the power station. Ash from the power plant has been dumped in a valley immediately behind and now fills part of that valley. There is a possibility that polluting chemicals from that dump are being leached by rainfall into the water system entering the northern sector of the Park. There is some evidence that bird numbers and diversity have declined in lagoons in that sector; and that the lagoons support a strangely low diversity of aquatic invertebrates and submerged macrophytes. The cooling system comes from the sea and is pumped in pipes which cross the north-east sector of the Park. Leaking from these pipes has occurred within that sector, changing the water quality balance of that area. Air borne chemical pollution may be an issue. Trees adjacent to the power glant have very low quantities and diversity of lichens, in stark contrast with similar habitats elsewhere.

Knowledge of the impacts of Es Murterar is currently inadequate. Proposals have been made to obtain further and better data relating to these potential impacts.

Others (indicate the importance, the area of influence and the impacts caused, real or potential)

ACTIVITIES AT SITE LEVEL

Specify the activities that you are planning to carry out at this wetland site and indicate in which years. Add any other activities that you consider needed.

Development of plans & programmes	Year 1	Year 2	Year 3
Development of a management plan			
Development of monitoring programmes			
Development of educational/visitor programmes			
Development of restoration plans	800.000		
Other			
Budget (indicate currency) Peseta Franc Lira	Year 1	Year 2	Year 3
Annual	800.000		
Total			
Comments			

Implementation of plans & programmes	Year 1	Year 2	Year 3
Implementation of management actions (indicate which in box)	82.206.487		
Implementation of monitoring	7.443.228		
Implementation of visitor programmes	49.781.425		
Implementation of restoration actions	23.650.000		
Other			
Budget (indicate currency) Peseta Franc Lira	Year 1	Year 2	Year 3
Annual	162.281.140		
Total			
Comments			

Promotion of sustainable activities Year 1 Year 2		Year 3	
Promotion of sustainable agriculture			
Promotion of sustainable grazing			

Promotion of sustainable fishing			
Promotion of sustainable hunting			
Promotion of sustainable tourism			
Other			
Budget (indicate currency) Peseta Franc Lira	Year 1	Year 2	Year 3
Annual			
Total			
Comments			

Other	Year 1	Year 2	Year 3
Budget (indicate currency) Peseta Franc Lira	Year 1	Year 2	Year 3
Annual			
Total			
Comments			

INFORMATION PROVIDED BY:

(if more than one person, please add extra pages)

Date	12.3.2001
Name	Juan Salvador Aguilar Gonzalez
Position	Biologist. Park's director
Region (official name)	Mallorca. Illes Balears
Country	Spain
Agency/ Department/ Organisation	Parc Natural de s'Albufera Direccio General de Biodiversitat
Ministry (if applicable)	Conselleria de Medi Ambient.
Contact address	Parc Natural de s'Albufera Llista de correus
Post code / city	07458 Can Picafort
Telephone	+34 971 892250
Fax	+34 971 892158
E-mail	See web site
Web site	http://www.mallorcaweb.net/salbufera/
Other relevant information	

INFORMATION PROVIDED BY:

Date	12.3.2001
Name	Gabriel J. Perello Coll
Position	Geographer
Region (official name)	Mallorca – Illes Balears
Country	Spain
Agency/ Department/ Organisation	Parc Natural de s'Albufera – IBANAT Direccio General de Biodiversitat
Ministry (if applicable)	Conselleria de Medi Ambient
Contact address	Parc Natural de s'Albufera Llista de correus
Post code / city	07458 Can Picafort
Telephone	+34 971 892250
Fax	+34 971 892158
E-mail	See web site
Web site	http://www.mallorcaweb.net/salbufera/
Other relevant information	 http://www.fsd.nl/TAIB/mainalbu.html http://www.wetlands.agro.nl/ramsar_database/Ramsar_Dir/Spain/Es008d99.doc BASICAL BIBLIOGRAPHY: BARCELO, B., y MAYOL, J. (Coord.) (1980). <i>Estudio ecologico de la Albufera de Mallorca</i>. Dpto. de Geografia, Universidad de Palma de Mallorca. MAYOL, J. & MARTINEZ, A. [Eds.] (1996): <i>S'Albufera de Mallorca</i>. Monografia Cientifica n° 4 de la Societat d'Història Natural de les Balears. Palma de Mallorca. MAYOL, J.; LLABRES, A.; AGUILO, J. A., PERELLO, G. y MUNTANER, J. (1993). <i>S'Albufera; guia de paseo</i>. Conselleria d'Agricultura i Pesca/SEFOBASA. Govern Balear. Palma de Mallorca. RIDDIFORD, N. & MAYOL, J. (1996): <i>S'Albufera de Mallorca, Spain</i>. In TOMAS VIVES, P. (ed.) <i>Monitoring Mediterranean Wetlands: A Methodological Guide</i>. MedWet Publication; Wetlands International, Slimbridge, UK. RIDDIFORD, N. (2001): S'Albufera de Mallorca Biodiversity Catalogue. Conselleria de Medi Ambiet. Palma de Mallorca (<i>In press</i>).

INFORMATION PROVIDED BY:

Date	12.3.2001
Name	Nick Riddiford
Position	Principal investigator, TAIB
Region (official name)	Scotland
Country	UK
Agency/ Department/ Organisation	The Albufera International Biodiversity Group (TAIB)
Ministry (if applicable)	
Contact address	Schoolton, Fair Isle, Shetland
Post code / city	ZE2 9JU
Telephone	+44 1595 760250
Fax	+44 1595 760250
E-mail	See web site
Web site	http://www.fsd.nl/TAIB/mainalbu.htm
Other relevant information	The Albufera International Biodiversity group comprises an independent team of scientists, drawn from the UK, Mallorca, Spain and other parts of Europe. TAIB was set up to support environmental conservation at s'Albufera and more widely in the Balearic Islands through multi-disciplinary project work. Its main tasks are to evaluate the effects of a controlled management regime on biodiversity and the environment, assess the relative contributions to change made by management and outside factors (including climate change) and provide science-based guidance for conservation management planning. In addition, the Project specialises in biodiversity training and invites competent volunteers to assist in data collection and monitoring. This allows the project to gather an unusually extensive data set at relatively low cost.