

World Heritage Sites

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IBIZA: BIODIVERSITY AND CULTURE SPAIN

The shallow waters between the islands of Ibiza and Formentera nurture dense prairies of Posidonia sea-grass, a species endemic to the Mediterranean basin, which has helped to create their coastal and marine ecosystems and, with the flanking saltpan lagoons, supports a great diversity of marine and bird life. Archaeological sites on Ibiza preserve the evidence of a long history from the Phoenician-Carthaginian period to the 16th century fortified Upper Town, an example of Renaissance military architecture very influential on the fortification of ports in the Spanish Americas.

COUNTRY

Spain

NAME

Ibiza: Biodiversity and Culture

MIXED CULTURAL & NATURAL WORLD HERITAGE SITE

1999: Inscribed on the World Heritage List under Cultural Criteria ii, iii, iv and Natural Criteria ix & ix.

STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]

The UNESCO World Heritage Committee issued the following statement at the time of inscription:

Justification for Inscription

Criterion (ix): The evolution of Ibiza's shoreline is one of the best examples of the influence of *Posidonia* on the interaction of coastal and marine ecosystems.

Criterion (x): The well-preserved *Posidonia*, threatened in most Mediterranean locations, contains and supports a diversity of marine life.

Criterion (ii): The intact 16th century fortifications of Ibiza bear unique witness to the military architecture and engineering and the aesthetics of the Renaissance. This Italian-Spanish model was very influential, especially in the construction and fortification of towns in the New World.

Criterion (iii): The Phoenician ruins of Sa Caleta and the Phoenician-Punic cemetery of Puig des Molins are exceptional evidence of urbanization and social life in the Phoenician colonies of the western Mediterranean. They constitute a unique resource, in terms of volume and importance, of material from the Phoenician and Carthaginian tombs.

Criterion (iv): The Upper Town of Ibiza is an excellent example of a fortified acropolis which preserves in an exceptional way in its walls and in its urban fabric successive imprints of the earliest Phoenicians settlements and the Arab and Catalan periods through to the Renaissance bastions. The long process of building the defensive walls has not destroyed the earlier phases or the street pattern, but has incorporated them in the ultimate phase.

INTERNATIONAL DESIGNATION

1993: *Las Salinas de Ibiza y Formentera* designated a Wetland of International Importance under the Ramsar Convention (1,640 ha).

IUCN MANAGEMENT CATEGORY

IV Habitat / Species Management Area

BIOGEOGRAPHICAL PROVINCE

Mediterranean Sclerophyll (2.17.6)

GEOGRAPHICAL LOCATION

The site is in the western Balearic Islands of Ibiza and Formentera in the western Mediterranean 90 km east of the Spanish mainland. Formentera lies just south of Ibiza. Centred on 38°46'N by 11°26'E.

DATES AND HISTORY OF ESTABLISHMENT

- 1989: The *Salines d'Eivissa i Formentera* first designated a Natural Reserve by Natural Law 4;
- 1992: The *Els Freus / Salines d'Eivissa* Nature Area of Special Interest created by Natural Law 1/1991 and declared a Special Protection Area (1,179 ha) under the European Community Birds Directive;
- 1993: The saltpans designated a Ramsar Wetland;
- 1995: *Ses Salines d'Eivissa i Formentera* Terrestrial and Marine Natural Reserve established by Natural Law 26;
- 2000: The *Salinas de Ibiza y Formentera* declared a Special Area for Conservation under the European Community Habitats Directive. The Natural Reserve became a Natural Park;
- 2008: The Estany des Peix lagoon declared a Special Waterfowl Protected Area and national Biosphere Reserve.

LAND TENURE

Publicly owned except for the land in the Ramsar reserve (1,640 ha) which is private property (Anon. 2001). The management authority is the General Direction for Nature Conservation under the Balearic Government Council for the Environmental Management of Lands and Shorelines (*Conselleria de Medi Ambient, Ordenació del Territori i Litoral del Govern Balear*) and the National Ministry of Public Works and the Economy.

AREA

8,564 ha. This is approximately 5.5% land, 4.5% wetland and 90% marine.

ALTITUDE

From -40m to 160m.

PHYSICAL FEATURES

The site is in the Pitiusas Islands, Ibiza and Formentera, the westernmost islands of the Balearic Archipelago. It is comprised of the coastal plains, lagoons, marshes, saltflats (*salinas*), fixed and shifting dunes, cliffs and beaches of the south end of Ibiza and north end of Formentera, the small low-lying islands in the Freus strait between them, Espalmador, Espardell and Penjats, plus the surrounding seas to the depth of 40m. The area on Ibiza is a flat alluvial plain formed by Quaternary calcareous deposits, with two enclosing wooded hills, which rise from the sea, Puig d'es Corb Marí (160m) and Puig d'es Falcó (144m). On Formentera, behind dunes, are two similar more extensive saline lagoons: the Estany de's Peix connected to the sea and the large Estany Pudent. On Espalmador, the largest islet, there is an enclosed inland lagoon. These lagoons have long been used commercially as salt pans. Their only continuous replenishment is sea water from the industrial use of the salt marshes, and the ground water is heavy in salts. The soils of the salt marshes are silty-sandy regosols poor in humus but enriched in places by plantation forests and later crops, with *terra rosa* in the few farmed areas (Anon., 2001).

Most of the sea floor of the Reserve between the two islands is a wide submarine platform with a sandy substrate averaging 15m deep. In northwestern Formentera, there are coastal reefs four metres high, the highest known formation of this kind (San Félix, 1998). Huge seagrass prairies south of Ibiza exemplify the interaction of coastal and marine ecosystems: the ongoing accumulation and decomposition of their litter have led to development of the sandy beaches of the site. There is also a series of underwater caves with elements that have helped in the assessment of the geological and geomorphological evolution of the islands (IUCN/ICOMOS, 1999).

CLIMATE

The climate of the islands is semi-arid with high average temperatures, mild winters, long summers, a low annual average diurnal range and high insolation (2,800 hours per year). The annual average

temperature for Ibiza is 18-19°C and from June to September, more than 25°C. On Formentera, the averages are slightly higher, but the average maximum is less than 30°C. It can freeze from December to March on Ibiza, but never on Formentera which is low-lying and more exposed to the sea. The annual temperature range is 14°C on Ibiza and 13°C on Formentera. Rainfall is irregular and light: 380mm on Ibiza and 350mm on Formentera, falling mainly between August and December with some in April. The rainfall is usually torrential and the unstable weather of autumn and spring is often stormy. Summers are dry. Annual evaporation is high year-round with the water deficit spread over nine months on Ibiza and ten on Formentera. The dominant winds are from the west and southwest in winter and from the east in summer (Anon., 2001).

VEGETATION

The flora is strongly influenced by the proximity of the sea, the high humidity, salinity and the mobility of the sand dunes which leads to the formation of microclimates. Underwater, the vast, dense prairies of oceanic posidonia seagrass *Posidonia oceanica* are of a species threatened throughout the Mediterranean, here very well preserved. The area is one of the best examples of the effect of *Posidonia* on interrelated coastal and marine ecosystems. With the coral reefs it supports a great diversity of marine life: one hectare of *Posidonia* produces 21 tons per year of biomass, similar to the productivity of a tropical forest of 22 ton/year/ha. The grass also purifies coastal waters by retaining sediments and oxygenating the water, the reefal aggradation of its litter stabilises and builds beaches, buffering the coast and coral reefs from storms, and the meadows are a nursery for many varieties of fish, helping to maintain a sustainable fishery. The main terrestrial ecosystems are associated with the salt pans and grow in bands parallel to the coast graded by their tolerance of the salinity of the soil. 40 vegetation types have been mapped for the north of Formentera alone, from marsh to halophytes, dune vegetation, grassland, quite dense garrigue to forest of Phoenician juniper *Juniperus phoenicia* and Aleppo pine *Pinus halepensis* once the typical coastal forest of the Mediterranean but now rare. (The classical Greek still used name for the islands, *Pitiusas* means pine islands.) Espalmador has probably one of the few relics of this forest in the entire basin. There are several rare species endemic to the Balearics, Ibiza and Formentera, such as *Genista dorycnifolia*, *Chaenorrhinum organifolium*, *C. rubrifolium formenterae*, *Senecio leucanthemifolius*, *Diplotaxis catholica* and *Silene littorea*. The site holds 11 species of plants endemic to the Pitiusas or Balearic islands, 7 species nationally classified as rare and 8 as vulnerable (Anon., 2001; IUCN, 1996).

FAUNA

There are three species of mammals endemic to Ibiza: Ibizan genet *Genetta genetta isabellae*, greater white-toothed shrew *Crocidura russula ibicensis*, Ibizan longtailed fieldmouse *Apodemus sylvaticus eivissensis* and two on Formentera: the giant dormouse *Eliomys quercinus gymnesicus* (VU) and a relative *Apodemus sylvaticus frumentariae*. There are also 2 amphibians, Balearic green toad *Pseudepidalea balearica* (Ibiza only) and Perez's frog *Pelophylax perezii*, 11 reptiles including Turkish gecko *Hemidactylus turcicus*, Moorish gecko *Tarentola mauritanica*, spur-thighed tortoise *Testudo graeca* (VU), on Formentera only, and 11 endemic subspecies of the Ibiza wall lizard *Podarcis pityusensis*, each on a separate island; but no snakes exist. There are 56 species of invertebrates, 37 being beetles.

The seas around the site contain a population of the Mediterranean monk seal *Monachus monachus* (CR), one of the twelve most endangered mammals in the world. The loggerhead turtle *Caretta caretta* (EN) and bottlenosed dolphin *Tursiops truncatus* also occur. A highly diverse marine community exists dominated by a Mediterranean endemic, the colonial and zooxanthellate scleractinian coral *Cladocora caespitosa*, which supports 220 species, the highest known for the Mediterranean. Another is formed by the colonial sea squirt *Ecteinascidia turbinata*, which produces a chemical valuable in the treatment of cancers. There are also several species of sponge which have disappeared from other parts of the Mediterranean. 36 species of fish are recorded, belonging to 15 families: striped seabream *Lithognathus mormyrus*, red mullet *Mullus barbatus* and striped red mullet *M. surmuletus* are especially abundant.

The salt marshes of Ibiza and Formentera are important above all for waterfowl. There is a highly diverse avifauna with 210 recorded species 171 of which are migratory. This results from the diversity of environments as breeding and wintering habitats: marine channels, shorelines, salt marshes, islets, garrigue, woodland and even low cliffs on Ibiza. Most are concentrated on the coastal lagoons and salt pans. According to the Ramsar information sheet (2001) at Estany Pudent alone, 125 species have

been identified, and at the Estany d'es Peix, up to 30 aquatic and marine species. Sea birds have large breeding colonies in the site, including those of the Balearic shearwater *Puffinus mauretanicus* (CR), Yelkouan shearwater *Puffinus yelkouan*, Cory's shearwater *Calonectris diomedea*, storm petrel *Hydrobates pelagicus*, Audouin's gull *Larus audouinii* and Caspian gull *L. cachinnans*. The Kentish and little plovers *Charadrius alexandrinus* and *C. dubius* and black-winged stilt *Himantopus himantopus* (80 pairs) also breed in the area. The salt flats and lagoons are a major resting area for migratory waterfowl. Sea birds rare in the Mediterranean but seen here in winter or during migration, are the razorbill *Alca torda*, Atlantic puffin *Fratercula arctica*, kittiwake *Rissa tridactyla*, northern gannet *Morus bassanus* and guillemot *Uria aalge*. Seven species of ducks frequently winter there, including ferruginous duck *Aythya nyroca*. The greater flamingo *Phoenicopterus ruber* bred in the Estany Pudent until the 18th century and are still frequently seen in winter during migration in groups of up to 30. Among the aquatic wintering birds is the black-necked grebe *Podiceps nigricollis*, which congregates in the Estany Pudent, its main wintering ground in Spain. Shore birds are frequent, especially during migration; up to 40 species can be seen in the ponds and salt marshes. Among the birds of prey, osprey *Pandion haliaetus* bred in the area until recently and is still frequently seen. Eleanora's falcon *Falco eleonora*, peregrine *F. peregrines*, red-footed *F. vespertinus* and kestrel *F. tinnunculus* occur among other species of migrating raptors. In winter, kingfisher *Alcedo atthis* is a frequent visitor, and European roller *Coracias garrulus* and Eurasian curlew *Numenius arquata* occur. Among the breeding passeriformes are Thekla lark *Galerida theklae* and the Balearic warbler *Sylvia sarda balearica*.

CONSERVATION VALUE

Oceanic *Posidonia* sea-grass prairies are an important marine community found only in the Mediterranean basin, in transparent and unpolluted coastal waters. They oxygenate the water and purify it from silt, help to buffer the shorelines and reefs from storms and are an important hatchery for many varieties of fish and so for the maintenance of sustainable fisheries. The Park lies within a Conservation International-designated Conservation Hotspot, a WWF Marine Global 200 Eco-region, a WWF/IUCN Centre of Plant Diversity, and contains a Ramsar wetland.

CULTURAL HERITAGE

The site has more than ten underwater archaeological sites of the Late Bronze Age which have revealed the extent of early trade in the western Mediterranean, most not yet adequately studied. Ebesos, the town of Bes, an Egyptian god, was founded by the Carthaginians in 654 BCE, and lived partly on the export of salt. Their water tanks, the Phoenician ruins of Sa Caleta and the uniquely rich material from the tombs of the Phoenician-Punic cemetery of Puig des Molins are exceptional evidence of social life in a Phoenician colony of the western Mediterranean. The Romans cultivated Formentera for wheat. The Arabs took the island in 902 and the Catalan Spanish by 1235. The Upper Town of Ibiza (*Dalt Vila*) is an excellent example of a fortified acropolis which incorporates in its walls and urban fabric the imprint of streets and buildings from the Phoenician, Roman, Arab and Catalan periods to the 16th century Italian-Spanish Renaissance. The intact fortifications dating from 1584-5 are a unique example of the military architecture, engineering and aesthetics of the time and a very influential model in the construction and fortification of ports in the New World.

Before the mid 20th century Formentera and even Ibiza were long isolated and the patterns of traditional land use had not changed for some 300 years. The organization of the Moorish irrigation system of Ses Feixes near Ibiza town which was maintained by the succeeding Christians, implies a well planned use of the soil and control of water resources, careful study of differences in levels, and the erection of dams and retaining walls which are evidence of an extensive social organization. Because of this state of conservation all but one of the saltworks are exceptionally well conserved and preserve a unique aquatic ecosystem showing that the exploitation of natural resources need not degrade them. The quality of the salt of *Las Salinas* derives from the quality of the coastal waters which depends largely on the functioning of the *Posidonia* ecosystem, a fact well known to the local people and the basis of their concern for the protection of their marine environment (IUCN/ICOMOS, 1999). Names in the local dialect are subtly different from the Spanish.

LOCAL HUMAN POPULATION

There one village on the site, Sant Francesc de s'Estany on Ibiza and one adjoining, Sant Francesc Xavier de Formentera, plus 3 or 4 smaller settlements. The main local use of the area is for hunting, salt extraction, fishing and recreation; there is almost no farming or livestock raising. The town of Ibiza

(population ~43,000 in 2007) is 5 km northeast and the island's airport lies immediately north of the *salinas*. (Anon., 2001).

VISITORS AND VISITOR FACILITIES

In the last fifty years, holiday tourism has become the mainstay of the Ibizan economy and the island receives thousands of visitors. Birders and swimmers visit the site which has several excellent beaches and guided visits are offered. There is a visitors' centre in Ibiza town and leaflets introducing the Natural Park and the Special Protection Area are available. Another visitors' centre at San Francisco Eremita is being completed. Formentera is only accessible by ferry.

SCIENTIFIC RESEARCH AND FACILITIES

Programs of environmental research are followed in the Nature Reserve. Statistics on the evolution of the environment and a record of various environmental data such as the frequency of forest fires, variations in the quantity and quality of water resources, are undertaken every year. There is an ongoing agreement with the Universities of Valencia, and Madrid and the Ecological Group of the Balearic Islands to continue with the research and monitoring activities in the reserve.

MANAGEMENT

The oceanic *Posidonia* meadows are an increasingly threatened community now listed as a priority ecosystem for protection under the EC Habitats 2000 Directive, the Birds Directive and under Annex IV of the Berne Convention. The jurisdiction and management authority for the *salinas* is the Government of the Balearics Council for the Environmental Management of Lands and Shorelines (*Conselleria de Medi Ambient, Ordenació del Territori i Litoral del Govern Balear*) through the General Direction for Nature Conservation. There are two administrative centres for the reserve, the headquarters on Ibiza and a second office on Formentera. A management plan for the area is being implemented but a shared vision of the overall management of the site with the authority responsible for its cultural aspects and a clear program of joint activities are still needed (UNESCO, 2010).

MANAGEMENT CONSTRAINTS

According to UNEP even in 1989 the seagrass communities were under threat throughout the Mediterranean, due mainly to increasing levels of pollution. The site is also under some pressure from hunting, urbanisation and tourism, and by the collection of Balearic shearwater chicks. In 1999 construction of a submarine pipeline to discharge treatment plant waters from Ibiza was averted, but the EC approved a project to expand the port of Ibiza in the buffer zone 5 km north of the site, by extending a protective dike, and dumping the silt at a site previously used within the National Park but outside the property's boundaries. Sediments from dredging, trace-metal pollution and traffic from this work could impact the coastal dynamics and the integrity of the site's marine life, also its underwater archaeological resources in the Botafoc area. In addition, the port buildings may diminish the visual quality of the old town, which may also be disrupted by the increase in traffic unless it is integrated with regional and urban plans (UNESCO, 2010).

STAFF

In 1999 there were 10 permanent staff with four vehicles for terrestrial patrols and one boat for marine work. The team is composed of specialists in natural resources management, environmental interpretation, environment conservation, education (oceanographer and biologist), resources monitoring (zoologist and botanist) and information (2 guides). It is supported by the local police and the National Coastguard, the latter being essential in the marine and coastal areas. Rangers and technical staff receive training in management practices and biological monitoring through the Universities of Valencia and Madrid and the Ecological Group of the Balearic Islands. Volunteers, mainly members of local ecological groups and students help, particularly in summer where extra support is needed to clean up beaches and shorelines owing to the high numbers of visitors (IUCN/ICOMOS, 1999).

BUDGET

In 1999 the total annual budget for conservation and management was around US\$4 million, from the National Ministry of the Environment.

LOCAL ADDRESSES

Area Co-ordinator, General Direction for Nature Conservation, Ciudad de Queretaro, 07007, Palma de Majorca, CA, Spain.

Forest Service, General Direction of the Environment, Ministry of the Environment

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DATE

December 1999. Updated 2-2009, 10-2010, May 2011.