INTRODUCTION: WELCOME TO THE PARC.

Most Majorcan people have heard about S'Albufera (the name is pronounced "sa bufera").

S'Albufera is a famous, almost mythical place: its birds, eels, water and canals. It is also notorious for mosquitoes, strong smells and occasional and violent floods. S'Albufera has been used for many purposes: as a hunting-ground by privileged minority -as well as by poachers-. The origin of the delicious eels and last but not least the ruin of some ambitious agricultural enterprises. On a dry island like Majorca the contrast of a landscape of bridges and canals is especially attractive. S'Albufera offers all this and more: a diverse and plentiful fauna, a particular flora and culture of its own. S'Albufera is a unique place on the island and its natural values have been recognized and appreciated as such. This recognition was concreted with the declaration of the area as a natural park by the Balearic Government on the 28th Nov. 1988. A park that is a heritage of all the islanders, with its natural values and indigenous species. It is one of the most valuable ecosystems of the Balearic islands and enjoys the strictest protection.

S'Albufera's greatest treasure is its bird-life. More than 20 years ago ornithological value. Nevertheless the flora and the rest of the fauna are also important, so it is the ecosystem itself, the combination of flora, fauna and their environment as a functioning entity, that is its greatest value. It also provides an interesting example of the adaptation of human society, both work and leisure being shaped by its unique habitat. The history of the area also deserves to be known by its admirers. A rushed visit of half-an-hour is useless. S'Albufera is beautiful quality, but to reveal her beauty she needs time, perhaps a beautiful quality in itself. A casual and uncaring visitor will leave unsatisfied, having missed the mysteries of this enchanting place. There are no grandiose landscapes or huge exotic beasts. But for those with eyes to see, the strange beauty of the orchids, the graceful flight of the heron, and the occasional glimpse of a distant eagle, the haunting notes of the wind in the reeds, the shy look of the turtle, will have an unforgettable charm.

This is the S'Albufera which those who come in the right spirit can find. We hope this guide will be useful for those who want to enjoy the Park and believe that its beauty is the most important reason for respecting it conscientiously.

1. PREHISTORY: A LONG TIME AGO...

S'Albufera is one of the most striking geomorphologic landscapes of Majorca, its formation being a consequence of the geological processes which created the Island.

The emergence of Majorca as an island is relatively recent in geological terms, dating from the Upper Tertiary Era about 18 million years ago. Since then the
coastline has changed repeatedly, due to several periods of sea level fluctuation. S'Albufera is one of the areas affected by these processes.

In the Miocene, one of the periods of the Tertiary Era, the whole plain of Sa Pobla was flooded, due to a rise in the sea level. Coral reefs, similar to those in the Indian and Pacific Oceans, developed in these shallow marine waters. A few million years later the Straits of Gibraltar closed and the Mediterranean sea level fell rapidly due to evaporation. Then the Mediterranean was reduced to a series of salt lakes, but by the end of the Tertiary Era, in the Pliocene, Gibraltar opened once again, allowing the waters of the Atlantic Ocean to flood the low-lying Mediterranean area. The formation of small brackish lagoons in the plain of Sa Pobla and Inca dates from these times. This geological process, the sedimentary deposits of clay, result in a coastal lagoon having a relatively brief life (in geological, thought not in human terms) due to desiccation. If it had not been for the continual subsidence in this area during the Miocene and Pleistocene, the coastal lagoon of S'Albufera would have disappeared.

Glaciation in the last Quaternary Era caused great fluctuations in the sea level, alternately flooding and drying S'Albufera and other areas of the plain of Majorca. About 100000 years ago (in the Riss Glacial Period) the formation of a sandy coast gives the first indication of the emergence of the current S'Albufera.

A study of the sedimentation of S'Albufera has allowed geologists to determine that there are epochs in which salt water predominated, and other periods -of maybe centuries- when the water was almost, or even completely fresh. During these fresh water periods, layers of peat were deposited. These variations were a consequence of slight changes in the sea level, as well as of the increase of fresh water flowing into S'Albufera from streams or springs from the plain of Sa Pobla.

The landscape of S'Albufera has varied considerably during different times. At the peak of higher water levels, in the last 10000 years, it reached the Roman Amphitheatre at Alcudia, the whole side of the Murterar and beyond Son Fe, to where the Alcudia road runs nowadays; to the South it reached the Pont Gros and the Punta de S'Amarador and to the East up to Ca N'Eixut and Son Bosc.

During Roman times the water level was about 2-3 metres higher than today. Then S'Albufera became a succession of relatively shallow ponds, linked by canals. The pond called L'Estany dels Ponts had an approximate depth of 7-8 meters.

Historical documents record the condition of S'Albufera in more recent years, such as Berard's description (1789) or the one made by the engineer A. Lopez (1859), from which we have taken the information for a reconstruction in the 19th century (see page 40).

The most recent changes in shape and surface are not due to natural processes and will be described in the chapter "Man and S'albufera".
2. THE WATER

Water is the basic element of a landscape and ecosystem such as S'Albufera. This is why it merits a chapter in itself - it determines everything else.

There are three sources of water: flowing from the Island countryside, underground springs and seawater.

S'Albufera is the delta area of a large drainage area.

The rain that falls in this basin passes along various routes: either sinking into the substrata, evaporating, nourishing the vegetation or swelling the streams (Muro and Sant Miquel) which flow into S'Albufera. These two streams carry 20-40 cubic Hm. per year (the Sant Miquel 16 and the Muro 4-8). The bigger stream, the Sant Miquel, originates in the springs, Ses Ufanes de Gabellí, which flow periodically from a poit about 10 Km. NW of S'Albufera.

In fact, only a limited amount of water from both streams enters S'Albufera. During the last century embankments were raised along these streams, and thus by canalization their flow is directed to the sea so that it does not flood the farmland. You can see this canal system on the map. One area, called Es Forcadet, is allowed to flood - a triangular area before the two streams join the Gran Canal. If the flood of the streams coincides with a high tide, two lateral canals at the mouth of the Gran Canal (called Sol and Siurana) cope with the overflow, channeling it to S'Albufera. There is another conduit at the same latitude as the Punta des Vent, which passes under the es Mig road via a floodgate into the Canal Loco and the Colombar. There are other floodgates and conduits at different points of the streams. In some places the embankments are in a bad condition, allowing water to flood arable land, which greatly annoys the farmers.

Some fresh (or slightly brackish) water comes from underground. An unknown number of underground springs flow into the farmland, mainly in the South. It is estimated that water from this source totals between 25 and 30 cubic Hm. per annum. It is mainly this water which flows through the canals towards two outlets: the Pont del Anglesos (The bridge of the English), where the Sol and Siurana flow into the Gran Canal, and L'estany dels Ponts, which flows out mainly through the Canal Ferragut. To allow the water from the SW to cross the Gran Canal there is a series of conduits from the Canal del Sol to the Canal Siurana, passing underneath the two tracks and the Gran Canal. These conduits have been in operation for more than a century. The outlet of one of them can be seen as a powerful jet into the Siurana from the Pont de Sa Roca.

Seawater flows into S'Oberta at high tide and into L'Estany dels Ponts. The balance between salt and fresh water is critically important for vegetation and determines the entire ecosystem of the area.

Unfortunately there are some pollution problems. The stream of Sant Miquel is polluted by sewage from Sa Pobla (it is to be hoped that a sewage-plant will be in operation in 1991). There are also problems of pollution associated with the
agricultural use of fertilizers and pesticides. Fortunately the waters from nearby built-up areas that were a source of pollution are now almost totally treated.

3. SCENTS AND COLOURS: THE PLANTLIFE

The plantlife of S’Albufera is determined by two decisive elements: water and salt, ecological factors of obvious importance. Human influence has also had a discernible effect on the variety and evolution of the flora of S’Albufera.

Environmental factors (climate, soil, etc...) act together, and in the case of S’Albufera reinforce each other: the winter and spring rains coincide with increased flows from subterranean sources and from the springs around S’Albufera. In summer the lack of rainfall and the high temperatures increase evaporation and therefore salt concentration in many places.

The human influence is important: desiccation, the construction of canals, embankments, the introduction and conservation of species, the cultivation of farmland and its later abandon are all factors directly influencing plant-life. There is another factor related to man which has influenced the ecosystem immensely, namely fire. Until recently, the reeds were usually burned off after harvesting, and sometimes the fires have burnt all across S’Albufera. The long-term effects included the killing of many trees such as tamarisks and elms. Although fire can be a useful tool, its long-term effects from a broader perspective have been very damaging when abused.

To present the plantlife of S’Albufera we have grouped together the plants that share the same habitat. We will follow an imaginary journey from the beach into the interior and describe how different communities of plants make a home in a variety of circumstances.

THE BEACH AND DUNES

The coast of S’Albufera is sandy, with a narrow beach and a series of dunes. The sand is dry and loose allowing water to filter, easily moved by the winds, and poor in nutrition for plants.

The first plant we find on the beach is the wrongly named alga, actually a flowering plant, the Possidonia. It is a species which forms submarine posidonia prairies, washing up onto the beach when it dies. It is very fibrous and ends up forming earthen-coloured balls which wash up onto the beach, always a fascinating discovery for children playing on the beach.

Nothing much grows on the beach, as the breakers make it impossible for anything to grow. A few meters from the shore we find the long, yellow leaves of the marram and other Graminaceeous species, such as Elymus Sarctus and Sporobolus arenenarius. Growing nearby we can observe two different species of short herbs: the Medicago marina and Lotus creticus, with bent stems and compound leaves -at the beginning of spring these bloom with spectacular yellow flowers. The most
beautiful flower on the beach blossoms in summer: the large, white, beautifully-scented Seadaffodil. The best knows, if not the best loved plant, remembered by bare-footed bathers is the Seaholly, an umbellifer, small but with powerful thorns. Many insects are attracted to its blue petaled flowers. Also abundant are the Sea rocket and a kind of stock, the Matthiola sinuata, with big, purple flowers.

These are the salt-Resistent plants which inhabit the first crest of the dunes. Further inland we start to find woody plants which bind the sand with their roots, spreading widely to gather the water they need. These underground networks can be clearly seen where the dunes are affected by erosion or the passage of man. These types of plants play an important role in binding the sand into more permanent dunes. One unique local plant, not found anywhere else in the Balearic Islands, is the prickly juniper. Beyond the first juniper bushes we arrive at the pine trees, with umbrella pines, mastic trees, rosemary (the typical scent of the Mediterranean), heather (Erica multiflora) (with spectacular sprays of pink flowers in autumn), mock privet, Mediterranean mezereon, asparagus etc... Lianas grow amongst the bushes, and masses of Balearic sarsaparilla form a spectacular and impenetrable tangle unknown elsewhere on the Island. Also to be found are the honeysuckle and the tiny wild madder with its bitter leaves. These dunes are also notable for a sort of thyme exclusively found in Majorca and Menorca called Thumelaea Hirsuta. This is a bush of interwoven, hairy leaves which is extremely rare. In spring a diversity of orchids, with tiny and beautiful flowers, bloom amongst the pines.

THE PLANTLIFE OF THE FARMLAND

Here, just behind the dunes, where there is a clay, often water logged subsoil, we find the typical wetland flora.

The plants growing nearest to the seashore are the ones best adapted to a salty environment. The most important is the Salicornia, with joined fleshy leaves, sometimes reddish in color. Besides this, Sea purslane is often ot be found, identified by its opposite silvery leaves. In areas that are often flooded but with low salinity we find the rushes. There are several kinds of rushes, always with tall, spiky stems. Their leaves are scarcely visible, although they perform a particular vital function, as they accumulate the salt absorbed the plant, eventually dropping off and ridding the plant of excess sodium chloride. This is a densely-vegetated area, forming a mosaic of the various species. This patchiness is due to slight topographical variations, which cause changes in humidity, evaporation, salt-accumulation, etc.

In the fossil dunes (ancient dunes) we find a particular plantlife: formed by groups of Scirpus Holoschoenus (from the rush family), Plantago Coronopus (from the plantain family) and pine groves of varying sizes. Here too we find the rare blooms of orchids such as the mirror orchid, etc. For a few weeks the dunes are covered by a beautiful carpet of thousands of these tiny flowers. Nearby Orchis Palustris. Orchids and other rare plants are protected and to pick or uproot them is illegal -as well as immoral.
Areas which are permanently flooded by fresh-water are covered with a thick mass of reeds and Clarium Mariscus (a plant with sharp, ribbon like leaves from the sedge family). These two plants totally dominate the landscape of S'Albufera and form the basis of the ecosystem -by their dominance they actually limit the diversity and number of animal species, so it is necessary to curb their growth. Frequently, especially beside the roads, bellbines, with grouped leaves and white flowers are entwined around these plants.

There are aquatic plants too -the Potamogeton pectinatus being probable the most numerous, identifiable by its hair like leaves. The Ceratophyllum demersum is an attractive plant with leaves growing vertically from small bright red stems. The Chara and water-cress and Zanichellia palustris, with tiny leaves, are often to be seen.

In fresher, calmer waters the surface is often covered with a thick soup of duckweed. The greater bullrush of cat's tail (still gathered to use in handicrafts), the branched bur-reed and the lesser bullrush grow along the canals.

Smooth-leaved elms and poplars have been planted along the embankments and roadsides, forming small, rather strange, covering, deciduous woods. With them also grow hawthorn and bramble, which bears the delicious fruit so loved by walkers and birds, the periwinkle, lilac-colored and windmill shaped, also the creeping cinquefoil with yellow flowers and palmate leaves.

Here and there stand Tamarix africana (of the tamarisk family) which have survived the fires.

4. THE BIRDS
   FLYING TREASURES

S'Albufera's most prestigious and conspicuous groups of vertebrates are its birds, extraordinary in their diversity, abundance, visibility and audibility. Many ornithologists and photographers visit to seek out these shy creatures, of which more than two hundred species have been identified.

A walk among the paths and trails of S'Albufera will provide interesting opportunities to observe the birds, and an enjoyable day out. Many species are not found elsewhere on the Island. A pair of binoculars, or even better a small telescope, will aid you in your bird-watching.

How can we describe such beauty? Words are inadequate to describe the powerful flight of the ducks, the cry of the black-winged stilt or the piratical glide of the marsh harrier, the beautiful blue of the Kingfisher, or the color explosion of the bee-eater. No words can compare with the experience of these "little miracles". Thus we will limit our description to the naming of the more common species of each season, found in the salt flats, dunes or nearby cultivated fields.
RESIDENT BIRDS

About thirty species live and (generally) nest in S’Albufera all year around.

A wild duck, the mallard, is probably the best known, relatively numerous throughout the area. In the canals and small lakes are usually to be seen coots, identified by their black plumage and white beak, and moorhens, with white feathers on their sides and tails. These are probably the three species that will be seen by every visitor, and it is also easy to spot the little grebe and to hear the wild cry of the water rail.

The most common bird of prey in S’Albufera is the marsh harrier. It can almost never be seen away from the marshlands, but over the reeds you can see it flying, its wings forming a distinctive "V" shape.

Among the smaller species of birds that make their home here all year round are the hoopoe, the blackbird, the stonechat, Cetti’s warbler -outstanding for its song- the moustached warbler, probably one of the largest colonies in Spain being found here, the fan-tailed warbler, repeating its monotonous cry during winter. We must not forget the shy warblers, the tiny, pretty goldcrest, the restless great tits, or the plump corn bunting, the famous greenfinch, the goldfinch, the serins and the linnets (also members of the finch family).

Another group of birds can be seen all year round in S’Albufera, although these do not nest here. This is the case with the peregrine, the yellow-legged herring gull, the kestrel and, one of species which everyone wants to see, the osprey, the rarest bird of prey in Spain and in the Mediterranean, which visits S’Albufera daily to fish. There are several other species which, although they do not nest in the Balearic Islands, can be seen during most of the year, such as the redshank, the black headed gull and the little egret. Although these latter birds migrate away from the Islands to nest, some young and non-breeding birds always stay here, or leave the island for such short periods that there are almost always some of them to be seen.

SUMMER VISITORS

These arrive in the spring to nest here, migrating to parts of Africa (usually South of the Sahara Desert) for winter.

The little bittern and the purple heron are among this category. The first is tiny, wild and elusive. The purple heron by contrast is one of the biggest birds to be found at S’Albufera and its flight, with curved neck and long legs, is a majestic sight, typical of the summer in S’Albufera. Another long-legged bird is the black-winged stilt, black
and white with red legs. The little ringed plover is fairly common in Es Cibollar and Es Colombar.

In the order of the Passeriformes, (or perching birds and songbirds), are the yellow wagtail, which nests in the salt-flats, the great reed warbler and the reed warbler, common amongst the rushes and reeds.

The abundance of insects throughout the summer attracts the swifts, the swallows and house martins. One of the bird most fascinating for ornithologists is the Eleanora’s falcon, characterized by its swift flight, part of the swift family and fairly common here.

WINTER VISITORS

By the end of autumn, a host of birds in northern Europe and Asia, seeing a landscape covered with snow and finding the lakes freezing over, head South towards the Mediterranean, in search of a less harsh, more hospitable wintering ground. S’Albufera is one of these -an essential refuge for many thousands of birds.

This is the time to see the big, black cormorant, the elegant grey heron, and flocks of ducks, widgeons, teal, shovellers, pochards and tufted ducks... Each year a small flight of graylag geese also appear.

Of the waders, the most well-known and numerous is the lapwing, gathering in large flocks and often accompanied by golden plovers. Snipe are also common.

A great number of birds find food and refuge in the canals and vegetation of S’Albufera. Such is the case of the chiffchaff, the robin, the song thrush, meadow pipits and yellow wagtail. A sight worth seeing is that of a huge cloud of starlings (sometimes numbering hundreds of thousands ) appearing in the sky, often being chased by (or giving chase to) marsh harriers and falcons, until they fall like a living rain into the dense, distant reeds.