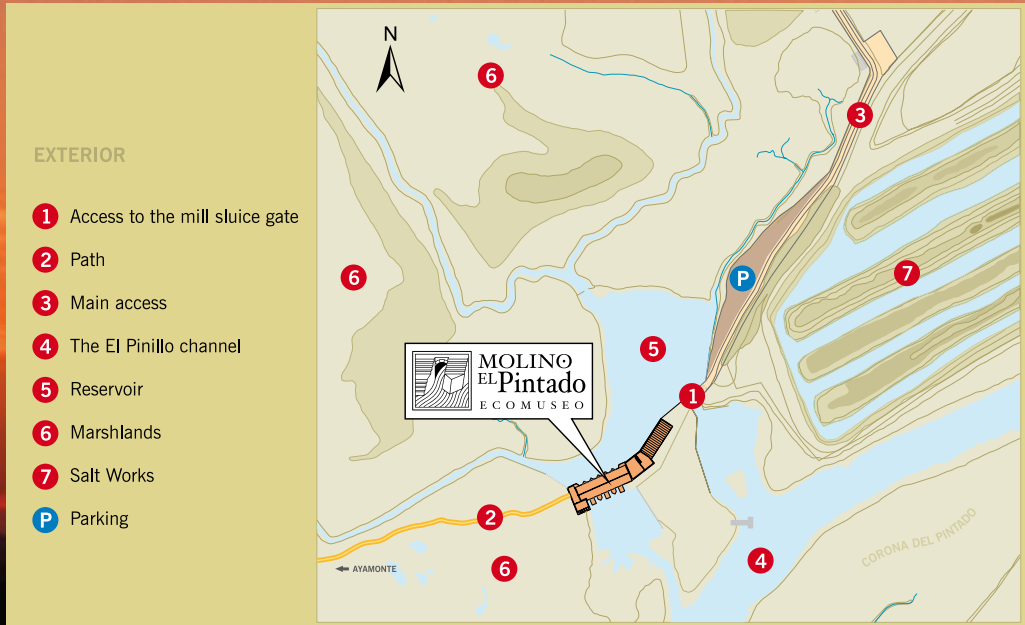


CONSEJERÍA DE MEDIO AMBIENTE

Ecomuseum
EL PINTADO MILL
Visitor's Guide



JUNTA DE ANDALUCÍA



The Isla Cristina Marshlands Natural Site which occupies 2,145 hectares in the municipalities of Ayamonte and Isla Cristina (Huelva), was declared a protected natural area in 1989. It is also included on the European Natura 2000 Network list, as it is a Special Protection Area for Birds owing to the importance of its birdlife. In addition, it is a Site of Community Importance (SCI) as it provides important habitats at a European level.

El Pintado Mill Ecomuseum has been designed both as an essential resource for understanding, evaluating and experiencing the Natural Site and as a tool for appreciating the cultural heritage associated with this way of life. This outstanding building was restored in 2008 to become a cultural and tourist facility in an environment in which it is perfectly integrated.

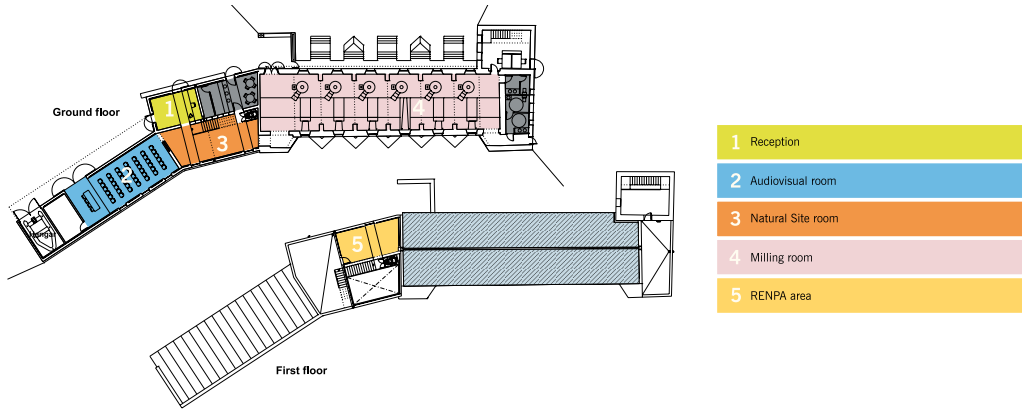


MOLINO
EL Pintado



El Pintado Ecomuseum Mill in the Isla Cristina Marshlands Natural Site





The El Pintado Mill Ecomuseum, located in Ayamonte in the province of Huelva, within the Isla Cristina Marshlands Natural Site, is a resource available to the public as part of RENPA (Network of Protected Natural Spaces in Andalusia). The purpose of this initiative was to disseminate and raise awareness of the values of the natural and cultural heritage of the region and the area.

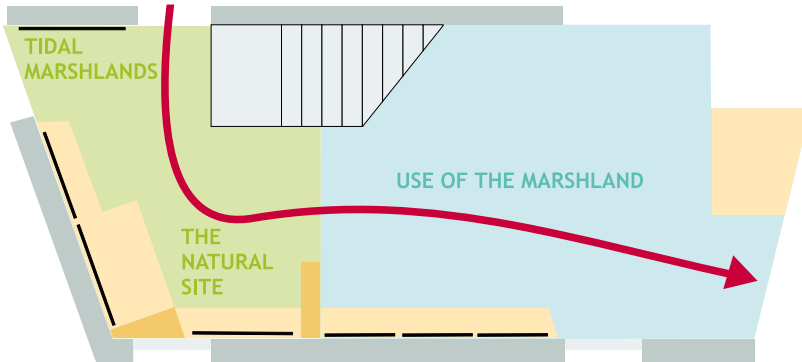
The Centre is made up of the following areas:

- **The Reception / Customer Service Area** has been specifically designed with the necessary equipment for all types of access needs, and offers the visitor products and information about the centre and its surroundings.
- **The Audiovisual Room**, where the visitor is immersed in a visual tour around the different sections and areas of this unique ecosystem. This room has also been designed for different uses, from meetings and workshops to temporary exhibitions.
- **The Natural Site Room.** In this first module of the interpretation area, the visitor is invited to participate in the process of getting to know the most relevant aspects of this Natural Site.
- **The Milling Room** exhibition area is one of the great attractions of the visit. A variety of resources and interactive elements bring the public closer to the history and special features of the mill, the miller and his traditional activities.
- **The RENPA Zone**, where the visitor can access various sources of reference material on the Network of Protected Natural Spaces in Andalusia (RENPA).





Natural Site Room

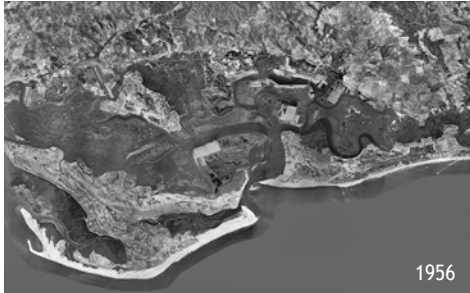


Exhibition Guide

Once past the reception area, visitors come to the entrance of the Audiovisual Room where they will be surrounded by a carousel of images, music and recordings of natural sounds.

The Interpretation Room of the Site has been designed to enhance and recognize the value not only of the ecosystem of such a remarkable area, but also the manner in which people can interact with it and the inexhaustible supply of resources that it still represents today. The objective is simply to give an overview of the special features of the environment that surrounds the Centre.





A young and dynamic coastline

The sediment and other accumulated matter that has been deposited by the Guadiana and Carreras Rivers, together with the Atlantic westerly winds and tidal currents, create new lands won from the sea: the marshlands. This dynamic coastline, together with the tides, creates these unique, new, singular places.

Sedimentation

The nature and intensity of the sediment is as varied as it is irregular. There is an almost constant rhythm of deposits of wind-carried sand, while at other times there are heavy rains and sea storms which make the accumulation of heavy material on the coast far more obvious.

Interior Marshlands

The Carreras and Plata Rivers together with the local Port maintain a permanent connection between the Natural Site and the sea. The confluence of these waters creates an exceptional wealth of life and nutrients. This is why this marshland area is a refuge for an abundance of perfectly adapted flora and fauna. Likewise, this flow of waters and nutrients permits the exploitation of these traditional estuaries and the more recent fish factories.



Besides the landscape, the most representative natural resources are the migratory birds, the estuary fish and the flora.





Egretta garzetta

The usual protagonists

The resident birds, which are the most common and well-recognized in these areas, fill the countryside, the water channels, the beaches and the estuaries with life and raise our awareness of the nature and importance of this coastal area.

- Bubulcus ibis*
- Lullula arborea*
- Larus argentatus*
- Picus viridis*
- Melanocorypha calandra*
- Galerida theklae*
- Charadrius dubius*
- Saxicola torquata*
- Cisticola juncidis*
- Cyanopica cyana*
- Tachybaptus ruficollis*

Tringa totanus



Podiceps nigricollis



A place to breed... and rest



Wintering birds



Breeding birds



Aquatic life



Flora



Landscapes

Espátula común

Platalea leucorodia

Tamaño

Longitud: 80-90 cm / Envergadura: 120-140 cm

Presencia habitual

Marzo-Octubre

Distribución

Europa, Asia y algunas zonas del norte de África

Alimentación

Plantas, caracoles y gusanos acuáticos, pequeños peces y anfibios

Nidificación

Colonias en árboles, cañaverales de pantanos y marismas muy concretas



Migratory birds are particularly important in these marshlands, where they find the ideal place to rest. Visitors, depending on their interests, can delve into these and other aspects of the Natural Site through the comprehensive interactive facilities.



*Gimiendo por ver el mar,
un marinerito en tierra
iza al aire este lamento:
¡Hay mi blusa marinera!
Siempre me la inflaba el viento
al divisar la escollera.*

RAFAEL ALBERTI



Marshland resources

The influence of the tides, ably exploited by man over the centuries, has made possible the existence of two traditional and compatible activities which are still practiced today - estuary fishing and the production of sea salt. Technological advances in these processes means that nowadays there are both fish farms and industrial salt works, although they are more specialised.



Seafood delicacies to trade and to enjoy

Although new directives recommend biological rest periods in order to reduce the over-exploitation of coastal fish and seafood stocks, the wealth that is generated continues to be one of the basic economic pillars of the area. Traditional fishing has given way to large canneries and factories which, from the high seas and far-off places, come here to unload their catches. In this way they sustain a still vital sector.



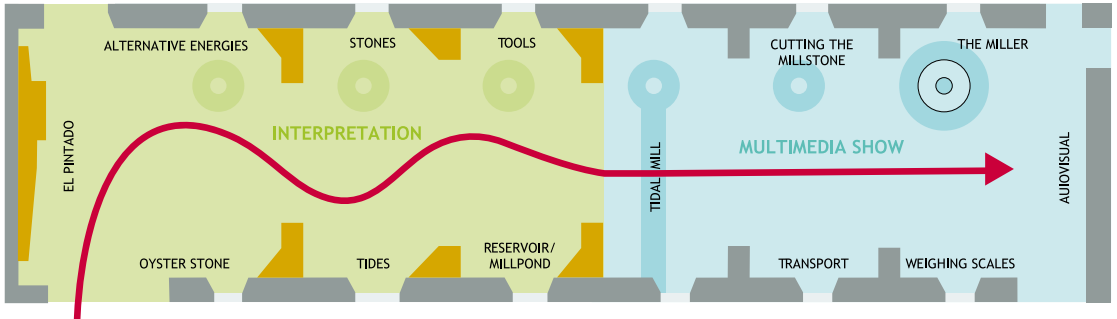
A place for leisure activities

Tourism in all its facets -seaside, nautical, inland, and cultural- has become established as the primary activity in the coastal towns of Huelva. Swimming, walking, boating, fishing, surfing, visiting villages and museums are a small selection of activities on offer on this white Andalusian coast.





Milling Room



Guide to the exhibits

The Milling Room takes you through the history and traditional processes of the mill itself. An introductory look at El Pintado and his influence in the region leads on to a section on the great significance of tidal mills in all Europe. This is followed by a look at the importance of the components and basic processes such as the tides, the oyster stone and the miller's trade.

The visit to the ecomuseum ends with a multimedia show centred on the miller and his traditional tasks, offering the visitor a range of sensations that sum up all the information received.



Manuel Rivero “El Pintado” An outstanding Ayamonte man

He became one of the most important traders of the Andalusian bourgeoisie of the 18th Century. He was a prosperous «indiano» who accumulated wealth and varied properties, becoming an important benefactor to his family and his country.

*Manuel Rivero
González (El Pintado).
1697-1780*

He came from a modest family with trade connections in the Americas. His nickname, «*El Pintado*», came about from the marks left by the measles that he suffered as a child. His trading adventures began at the age of 14 years when he worked as a cabin boy on ships trading with the Americas.

He and his wife Juana Inocencio Díaz Cordero had six children, and together they shared the management of the family business in Ayamonte, her home town.



As a wealthy trader, he was also interested in political office as these would be of benefit to him both socially and economically. He was given the responsibility for Ayamonte Castle and also became Deputy Chief Magistrate and Chief Justice of the city of Ayamonte and the surrounding towns.



El Pintado was a generous and educated man who gave some of his money to charity and commissioned sculptures, paintings, altarpieces and other artistic works.



Oyster stone

Coastal building materials

Rural structures in general, and mills in particular, used techniques and materials that were efficient and simple. Most used stones, bricks, sand and lime, and the walls were usually plastered. Manuel Rivero, *El Pintado*, used expensive new materials, such as oyster stone.

The El Pintado Mill was an unusual construction for the area. Oyster stone was commonly used for foundations and other architectural elements such as jambs, lintels, benches and parapets etc. In restoring the buildings, great care was taken in highlighting these elements.



The brown oyster stone from the Gulf of Cadiz was formed from hardened seashells, sand and sea-eroded stones. It is very porous and rough, but easy to work and resistant to salinity.



Lower part of Cadiz Cathedral, constructed with oyster stone quarried in the area.



The journeys between Ayamonte and Cadiz by Manuel Rivero's shipping company facilitated the supply of this stone, characteristic of the Cadiz coast.

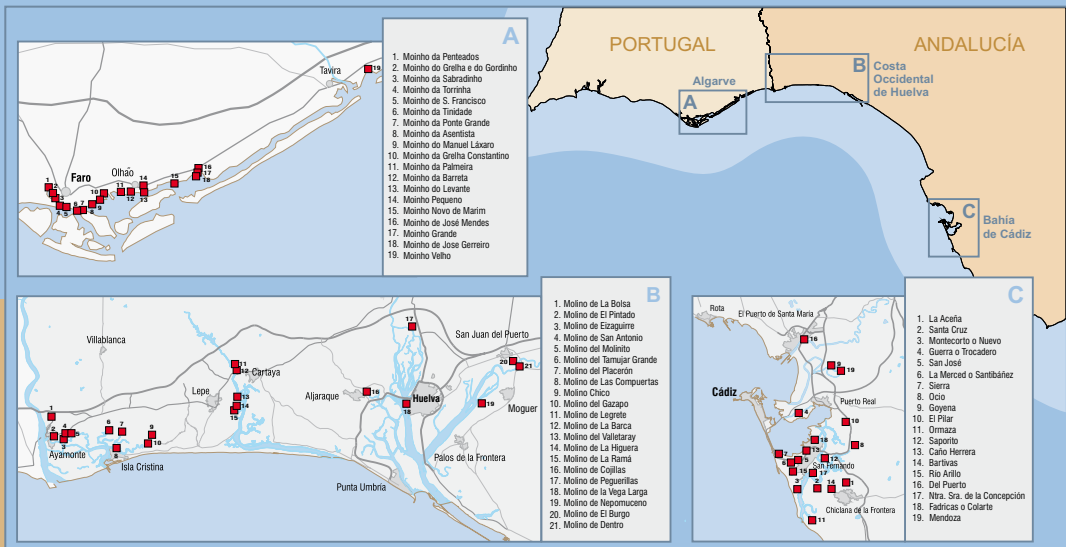


The name comes from Latin, and has also been given to a class and genus for the classification of sea molluscs.

Tidal Mills in the southwest peninsula

The El Pintado tidal mill was a construction specifically dedicated to milling. It used the same technology as hydraulic mills and in particular, those that made use of the tides to move the millstones. They were installed on the Spanish coasts after the Christian Reconquest, during the second half of the 13th century.

Location of the most significant mills



The presence of estuaries, marshlands and medium tides make the Atlantic coast from Faro to Cadiz an ideal location for the installation of tidal mills. As a result, more than a hundred salt-water tidal mills once existed along this stretch.



Novo de Marim (Olhão; Portugal)



Tamujar Grande (Isla Cristina; Huelva)



Río Arillo (San Fernando; Cádiz)

The Novo de Ria Formosa mill was the last working mill in the southwest peninsula until 1970, whereas the El Pintado was the largest on the Huelva coast. The Tamujar Grande mill was reused as a sluice for a fishing facility. Several tidal mills on the Piedras River were located about 10 kilometres from the coast. A neighbourhood in the city of Huelva was named after one of its mills, while in Cadiz, the mill on the Arillo River was, with 12 millstones, one of the largest in the peninsula.



Tidal mills in Europe

Mills constituted the first real industrial revolution in history, thereby enhancing the development of mankind. Tidal mills, in particular, were an ingenious exploitation of the extraordinary phenomenon of the tides.



Monte Saint Michel in Normandy, France. An impregnable fort, thanks to the extraordinary tides of the English Channel.

On the Atlantic coast, the height of the tides meant that numerous hydraulic factories could be built. The oldest tidal mill in Europe dates back to the 7th century AD in Ireland. In the Middle Ages (from the 5th to the 15th century), they spread across the rest of the Atlantic coast - to Scotland, Wales, England, Holland, Belgium, France, Portugal and Spain.



Carew Mill (Wales, United Kingdom)



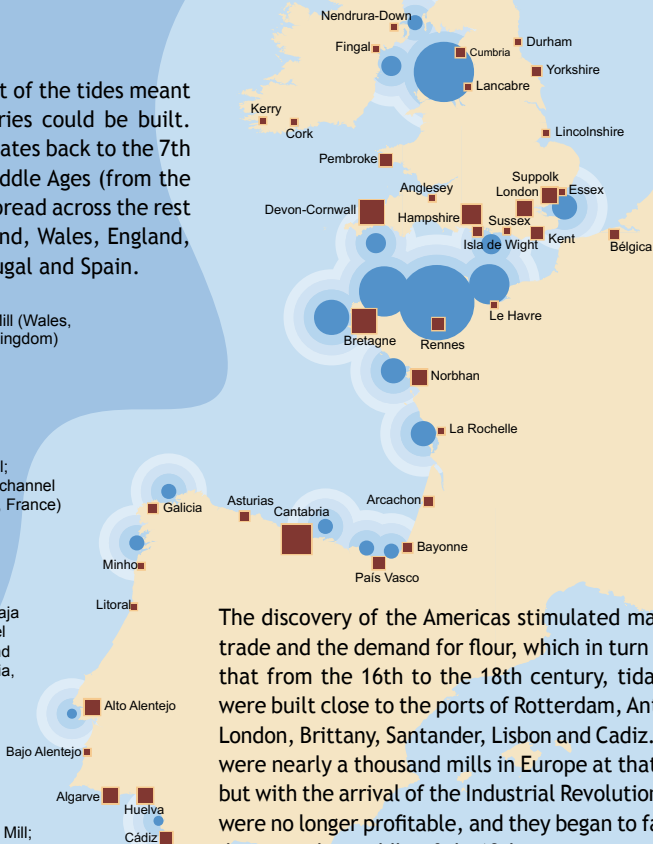
Birnot Mill; Kerpont channel (Brittany, France)



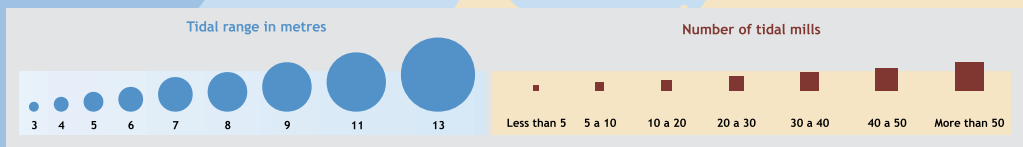
Santa Olaja Mill; Joyel marshland (Cantabria, Spain)

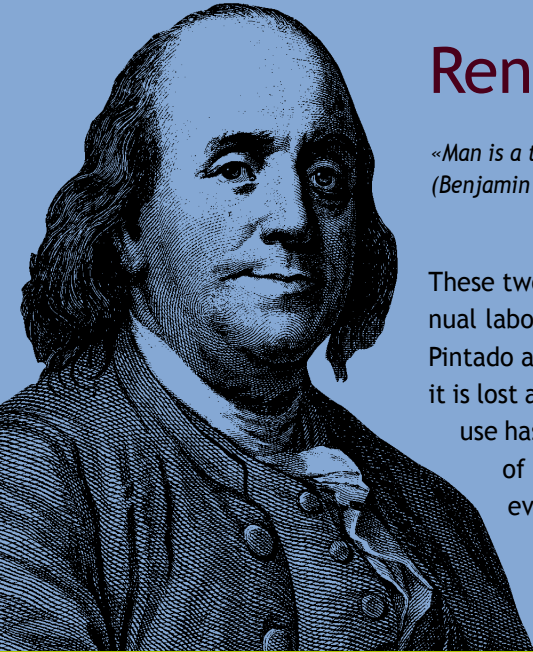


Corroios Mill; Tajo estuary (Seixal, Portugal)



The discovery of the Americas stimulated maritime trade and the demand for flour, which in turn meant that from the 16th to the 18th century, tidal mills were built close to the ports of Rotterdam, Antwerp, London, Brittany, Santander, Lisbon and Cadiz. There were nearly a thousand mills in Europe at that time, but with the arrival of the Industrial Revolution, they were no longer profitable, and they began to fall into disuse in the middle of the 19th century.





Renewable energies

«Man is a tool-making animal»
(Benjamin Franklin, 1707-1790)

«Who would dare to put limits on
the ingenuity of men?» (Galileo
Galilei, 1564-1642)

These two sentences sum up the importance of both hard manual labour and human scientific ability. Tidal mills such as El Pintado are devices that take advantage of tidal forces before it is lost at low tide. However, capturing this energy for human use has always been a challenge, and in these current times of high costs and depletion of fossil fuels, it is acquiring even more importance.

*Benjamin Franklin, American
politician, scientist and inventor*

Renewable energies are obtained from natural sources that are virtually inexhaustible due to the large amount of energy which they provide or for their regenerative capacity.

Wave energy

The constant undulation of waves moves mechanisms that produce electricity.

Photovoltaic energy

This converts light energy (visible solar light) into electricity thanks to the electronic properties of silicon.

Tidal energy

Submerged turbines are moved as the coastal tide rises and falls.

Solar Thermal energy

Solar radiation heats a coil or a water tank or it produces electricity through a turbine.

Hydroelectric energy

A waterfall moves a turbine connected to a generator which produces electricity.

Geothermal energy

Takes advantage of the Earth's heat, gases and steam from geysers as a source of energy to move turbines and generate electricity.

Wind energy

The force of the wind moves the blades of the windmill, turning the central rotor and generating electricity.





Stones used for grinding

«Dígote Sancho que boca sin muelas es como molino sin piedras y que en más se ha de estimar un diente que un diamante»
(Miguel de Cervantes)

Both literature and popular proverbs make good use of millstones as unique tools because of their weight and force, and above all, because of their importance in the social and religious life of bygone years. These proverbs emphasise the symbolic meaning of the millstones as being necessary for «giving us our daily bread».

«To take communion with a mill stone»
(Popular expression)



White here; grey in Central Europe

The local stones are known as white stones, and for centuries they were cut in one piece by specialised stone masons from Ayamonte and the Sierra de Huelva. As they wore down quickly, they needed to be continually re-cut. But from the 19th century onwards, the use of railways meant they could be imported from France either in pre-mounted blocks, or in pieces that were later held together with iron rings. These French stones were much more compact and long-lasting.



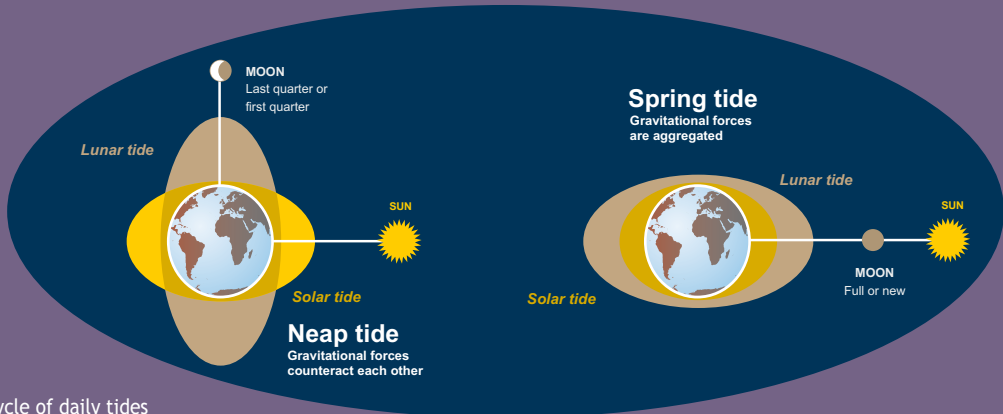
Mill craftsmanship

«A stopped mill doesn't earn its keep»
«If it doesn't mill, it must be ill»

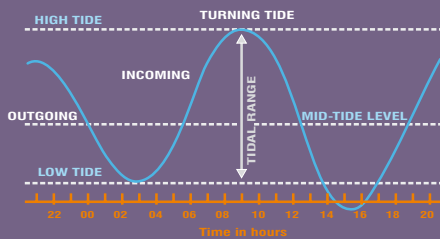
Self sufficiency in almost all the tasks and skills were indispensable characteristics for those involved in this ancient trade. When the milling work was over there was a lot of time between tides for the maintenance and upkeep of the different parts of the mill. Some repairs and tasks could only be performed at very low tides.



Tides - inexhaustible energy



Cycle of daily tides



The influence of the sun and the moon on the Earth, as well as other terrestrial forces, has a direct consequence on the surface of the seas and oceans. This periodic fluctuation of the water level is clearly visible on the coast.

The El Pintado Mill reservoir

The location of each mill along the coast influenced the size of the reservoirs, so that the characteristics of each one were generally quite different.

Tidal mills functioned thanks to a dam built in the marshlands, which filled with sea water at high tide. This reservoir, known as a «caldera» or millpond, produced energy capable of moving the millstones when the tide lowered sufficiently and the sluice gates were raised, so that the water passed through the interior of the mill.

... sale un estero o brazo que pasa lamiendo los muros de todo el frente del S. en dirección O. a E...; tiene en alta marea 2 brazas y no pasa de 3 cuartas en bajamar. De esta se derivan varios canales que, entrando por la marisma, conducen sus aguas a 6 molinos barineros que se hallan al E. También de la madre del r. se sacan 3 caños de agua, antes de llegar a la c. por el N., para dar movimiento a otros 4 molinos barineros.

*Description of the Ayamonte Marshland.
(Madoz 1845-50. Geographical Dictionary of Spain and its Overseas Possessions. Facsimile Edition. Huelva.)*





The tidal mill - water that has passed won't move the mill

For the system to work, all parts and sections of the mill had to fit together perfectly. The rotor will only turn at low tide, as it takes advantage of the movement of water from the millpond, through the interior of the mill to the water channel outside.



1. «Alfanje» or the base of the mill which forms the structure on which the mill stones are set. These millstones are cylindrical and of the same diameter.
2. The stationary lower stone or bed-stone is thick and solid to ensure that it lasts a long time. It has the same number of grooves as those in the wheel above, but cut in the opposite direction.
3. The turning or runner-stone is normally lighter than the bed-stone. It is held in place by the shaft and balanced by the rotor.
4. «Rodete» - a rotor or perforated circular metal plate that rotates with the force of the water.
5. The «Tolva» or hopper is a type of big wooden funnel or trough that spreads the grain over the grindstones at a constant rate.

Other parts: «Cabria» or shaft to hold up the chute, mat, wooden flour box, discharge gate screw shaft, sluice gate...

With the sluice gates, brain is better than brawn

Each of the six tidal mills has its own sluice gate. The number of gates opened at low tide was dependent on the state of each mill, the strength of the tide and the amount of grain to be milled.



The miller would use a pole as well as a lever on the wall to raise or lower the sluice gates, thereby increasing the flow of water as needed.

Stonemasons as well as millers

Stone masonry was a necessary and frequent task that guaranteed the quality of the flour. The process of stone-cutting involved lifting the upper stone or runner-stone so that both sides were accessible and the grooves on the millstones could be re-cut. Given the weight and the density of these stones, a lot of skill was needed to lift the stone and cut it.



Flour - White gold

«The mills have now ceased to move, and as much as the water insists, they will never work again because modern times have left this way of life behind... I feel the need to say this so that nothing is lost, and in this way a part of our history is kept alive».



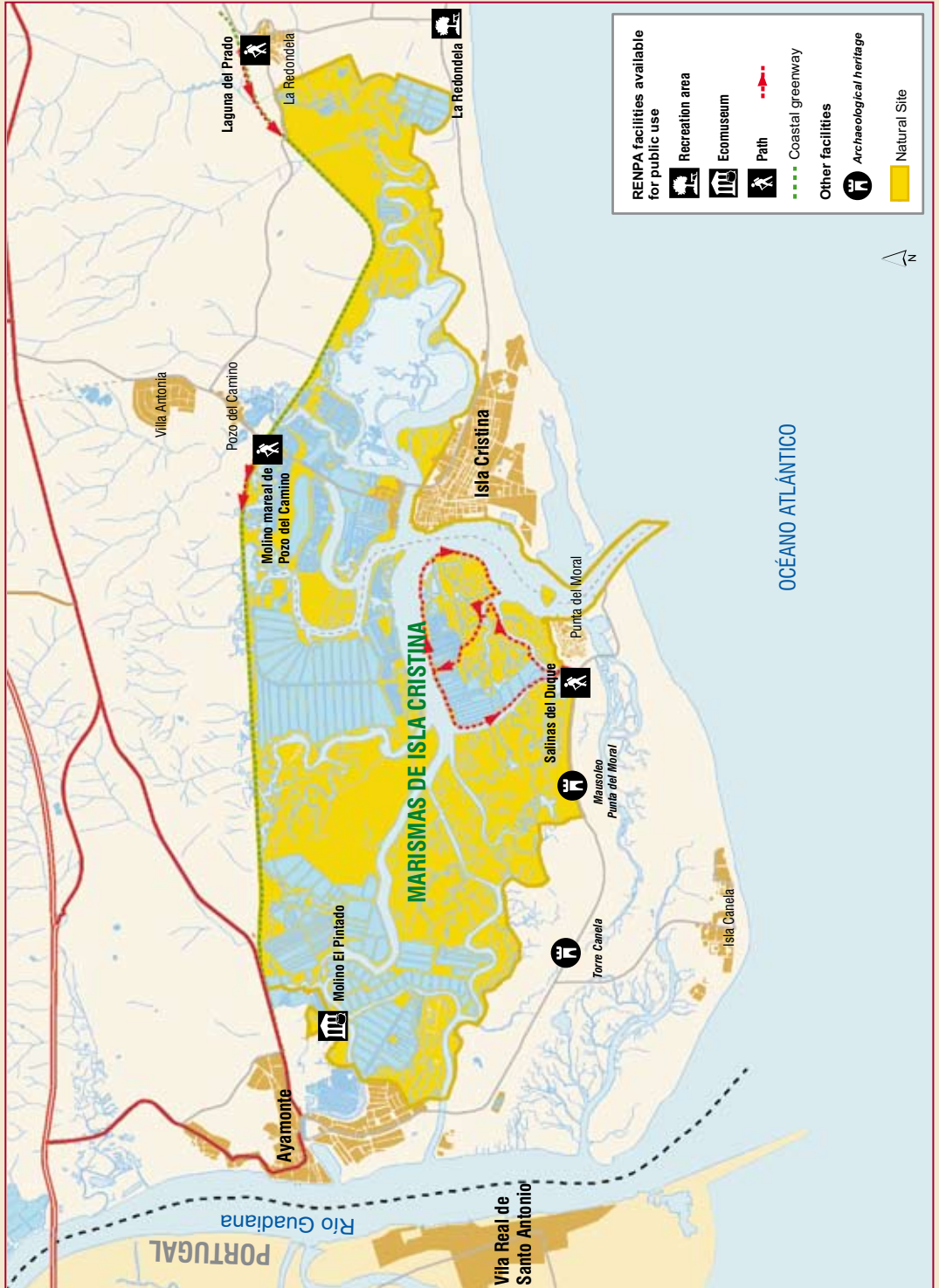
These words are meant as a statement of intent on the part of the miller regarding the importance of transmitting to the new generations the details of this traditional, and not so long ago indispensable, work.

A multimedia show recreates the details of some of these tasks, immersing the visitor in an experience in which all of the elements of the room seem to come alive for a few moments.

The visitor sees how the mill sometimes became a centre of loud activity. The miller is seen accompanied by other significant figures, such as his children or apprentices (to whom he passed on the details of the trade and its legacy), the usual pack horses or mules, or his dog, whose job was to keep the damaging plagues of rodents at bay.

Reproduction of the old milling room.





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www.ventanadelvisitante.es

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