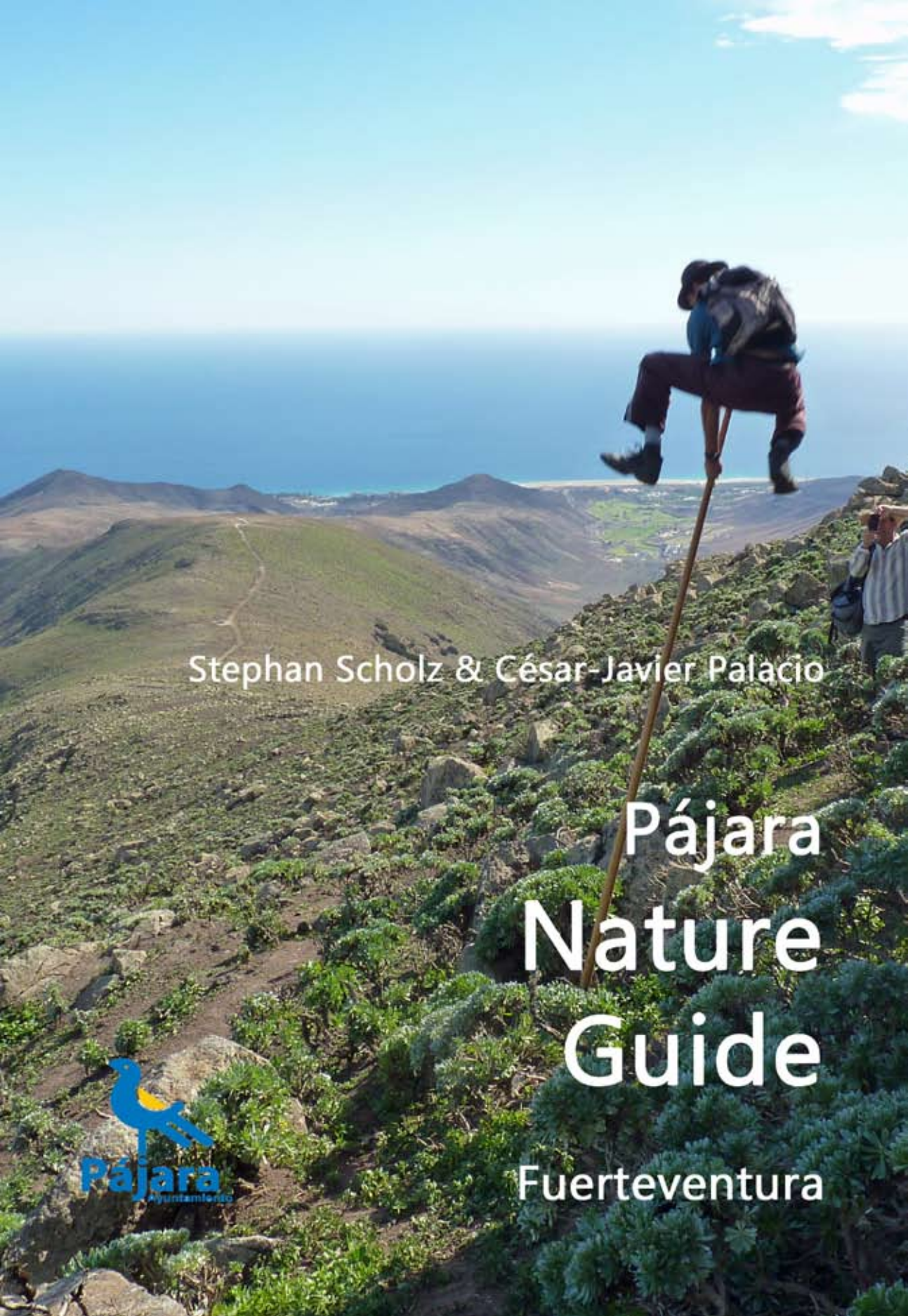


Stephan Scholz & César-Javier Palacio

Pájara Nature Guide

Fuerteventura

Pájara
Ayuntamiento

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web-vcersion , May 2016

in order of the Ayuntamiento de Pájara

Ayuntamiento de Pájara

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Pájara

Nature
Guide

Stephan Scholz
César-Javier Palacios

Fuerteventura, 2016

Prologue



Rafael Perdomo Betancor - Mayor of Pájara

The municipality of Pájara is currently one of the driving forces of tourism, and therefore an economic force of the Canary Islands. Its mild climate and vast golden sand beaches, around 30 of them, the largest expansion in the archipelago, justifies its more than 18,000 hotel room accommodation. This importance has been achieved over recent decades, while at the same time maintaining an extraordinary natural heritage, which is not only a source of pride but also a guarantee for the future. The Town Hall are relying on and putting their faith in this sustainable development.

Modernity and tradition are the hallmarks of our people, combined with a unique landscape recognized as a Biosphere Reserve. We have an individual culture which can be seen in its people, customs and spirit, which is renewed with the arrival of new residents from other countries and continents. They are welcome contributors to our valued cosmopolitanism.

If there is something in which we take pride in Pájara it´s our natural environment. The unique beauty is familiar to us, although not in as greater depth as we would like. We need to study it extensively, because only what is understood is loved and protected. This necessity is not exclusive to the residents of the borough. Hoteliers, restaurateurs, tour guides, ecotourism entrepreneurs and all those professionals who live in this natural environment need to know more in order to promote it more and pass on this knowledge to their customers.

For this reason today we are celebrating the publication of this nature guide written by two doctors from the University of La Laguna, Stephan Scholz and César-Javier Palacios. The first a biologist, the second a geographer, but both are adopted ´Majoreros´ and are united by their love of the island and their longing to reveal its beauties, be they geological, botanical or faunal. The book combines both academic details with readability, making reading it a simple exercise of exploration and discovery and far from boring. A number of our most popular routes for natural spaces are included, but thanks to the detailed information provided there are also now new ones to discover. For those who are not so familiar with the science of nature, the wealth of photographs provided is a great guide to identifying the plants and animals of Fuerteventura.

I hope this publication will help those who already have some background knowledge gain a greater insight into the natural wealth of the municipality of Pájara. And for those who don´t, I´m confident that the interest which led you to this guide will take you out into the countryside, to climb mountains, walk on the old volcanic areas, along the cliffs and to discover the hidden treasures of a very special and welcoming land.

Introduction

Until 40 years ago, the name of Fuerteventura was hardly known in Europe. A far distant and sparsely populated island whose inhabitants lived, or most of the time struggled to survive, on a scarce and precarious agriculture, livestock farming, fishing and the export of lime, all made more difficult by the constantly varying and harsh climate. Laborers were also sent to large phosphate mines in the then Spanish Sahara, just a little over 100 km away. In 1924 Primo de Rivera exiled the philosopher and poet Miguel de Unamuno here, after being very critical of his government. The islands location far away from the main social network and economic trends made it an ideal destination. Although he only spent a few months here, he was able to capture, unlike many, the spirit of nature and of the people of Fuerteventura which he then expressed in poems and writings.

Some decades later, Fuerteventura woke up to the modern world. Its sunny climate and vast beaches didn´t go unnoticed by tourism promoters and the island soon began to follow in the earlier footsteps of Gran Canaria and Tenerife, opening up to mass tourism. Increasing numbers of tourists came from central and northern Europe in an attempt to escape the harsh climate of their home countries for just a short while during the year. Today the island is visited by more than two million people each year. A large part of them come to our municipality of Pájara, the most southern and largest municipality on the island. Most visitors still come looking for sun and to swim in the clear waters, but a large and steadily growing number of them also want to know more about the nature of Fuerteventura: its flora, fauna and geology, and also about its people, its culture, history, customs and traditional way of life.

This Nature Guide of Pajara is intended for these people, and of course, for the residents of the island. We aim to show our municipality, not in isolation, but integrated and interconnected with the rest of the island, and it is obvious that much of the information presented may be useful in other parts of the geography of Fuerteventura. On the other hand, the guide aims to be more than a simple list of places to visit or a manual guide to identifying rocks, plants and animals found here. Our hope is that visitors can also start to understand about the geological processes that formed and shaped the island, as well as the way of life of some of its most representative inhabitants and survival problems they face. For example, we´ll discover how gravitational sliding forms oceanic islands and why vultures or “Guirres” are becoming increasingly rare. Each specific issue is described within the natural area with which it has the closest relevance. We do not forget the human beings that inhabit this land. It is obvious that the introduction of mass tourism has transformed the Majorero society. The number of inhabitants has dramatically increased, mainly due to the arrival of immigrants from other Canary Islands, from mainland Spain and later from South America and North Africa. Now there is a young and modern multicultural society immersed, as it is in the rest of the world, in the age of information and technology. However, the ancient roots still remain strong. For example, the farming of goats and sheep largely remains the same as it was hundreds of years ago, as does the ancient and effective ways of retaining scarce rainwater and cultivation of the land.

The main descriptive part of this guide is divided into nine chapters, corresponding to the different natural areas of Pájara which we have selected. Most of the selected areas are related to or form part of protected natural areas. The selection by no means claims to be complete; there will always be another equally interesting area that may be looked into in a future edition.

Each chapter briefly describes the location of the selected area and how to get there. This area will then be explained in five different aspects: geology and geomorphology, traditional uses, flora, fauna and paleontology; the latter only if the area in question has a point of interest in this area. The book „Common names of plants and animals of the Canary Islands“, by A. Machado and M. Morera, published in 2005 by the Canarian Academy of Language, is used as a source of names of various species and a list of the corresponding scientific names can be found in the appendix. Apart from the photos integrated into the texts, each chapter also includes several pages with pictures of flora and fauna common in the area in question, which can be used as a

quick visual identification guide. The majority of our selections are common species that visitors are more likely to see, but we have also included those which are more difficult to find, therefore revealing part of a hidden wealth which usually takes a little more time to be discovered. At the end of each chapter we have included one or more routes recommended for the visit. To do this, we have taken into account the existing network of walking trails and have graphically reflected these routes in a sketch which is not intended to be an accurate topographic map, but to provide further guidance in addition to the descriptive text.

During the excursions it is important to wear suitable clothing and footwear, and especially protection against the sun and wind (a cap, high protection sun cream etc). We also recommend to always carry plenty of water and a mobile phone in case of an emergency.

We would like to thank everyone who has contributed to this guide: Rafael Perdomo and Farés Sosa, who started the idea of approaching this work. Miguel Pena, Pedro Oromí, Juan José Bacallado, Lidia Soto, Martin Lechner, Francis Vilic, Juan Ramirez, Heriberto Lopez, Friedhelm Meise, Gerardo Garcia Casanova, Domingo Trujillo and Juan Jose Ramos, who contributed photographs, and to many friends who have shared with us ideas and information. A special mention goes to Maria Antonia Perera, who prepared the section on the history of the human population.

Our final wish is that this book will contribute to the reader a better knowledge of the interesting and varied aspects of nature and traditional life in Pájara.

The authors.

Pájara, May 2016

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Fuerteventura – the past and future of the Canaries

Geology and geomorphology

The history of the formation of Fuerteventura

Fuerteventura, like the other Canary Islands, is a volcanic island. A volcano is formed when hot material rises from the depths of the Earth to the surface. There are about 550 active land volcanoes around the world, which emit an average of 4 cubic kilometers of material each year, and many more under the sea. Most of them are found in unstable areas along the edges of the plates´ boundaries, that is, on the connecting lines between the movable plates which form the Earth´s crust. However, there are volcanic regions in the middle of some of these plates, such as in the case of the Canary Islands, which are located on the African plate. Generally the origin of these intraplate volcanoes is an area of heat, a ´hotspot´, which has risen from very deep layers of the Earth, located just on the boundary between the core and the mantle. These movements of energy, which are slow and can remain stable for millions of years, normally occur in almost cylindrical areas with a diameter of approximately 100 to 150 km, where the temperature is about 200°C higher than in the surrounding rocks, and are called „plumes".

After a long period of submarine volcanic growth, about 22 million years ago, a very small piece of land began to peek above the surface of the water. Many years later this piece of land would become what is nowadays the central area of the island of Fuerteventura. The geological period when the island was born and when its biggest period of growth took place is called the Miocene period and occurred between 23.3 and 5.3 million years before our time.

During the initial stages we can imagine rocky crags of different sizes spread over a wide area of the ocean, smoking and inhospitable. New eruptions frequently added to and took away pieces of this „puzzle" during this chaotic time, but a solid block was gradually formed which rose up and up until finally creating a large basaltic shield that geologists call the „main structure" of Fuerteventura. Almost simultaneously, perhaps only a few hundreds of thousands of years later, another island began to form further south, what is today Jandía, and something else began to emerge from the volcano which today makes

The oldest formations can be found in Ajuy





Punta de Jandía - the sea reshapes the volcanic rocks

up the northern part of Fuerteventura. At this time the bulk of Los Ajaches in southern Lanzarote, an island with which Fuerteventura shares its submarine base, began to form. Even further to the northwest an imposing volcano, whose tiny remnants currently form the Savage Islands, also began to rise up. However, to the west there was only the vast ocean which waited millions of years for Gran Canaria, Tenerife and the other islands of the archipelago to emerge from its surface.

Growing up independently at first, the three volcanic structures of Fuerteventura first touched and then merged to form a single island. Moreover, all the geological evidence indicates that, as with the rest of the Canary Islands, Fuerteventura was never part of Africa nor did it have any direct connections to this continent by land bridges. Previously, some 40-50 years ago, this was assumed by zoologists due to the presence on the island of certain invertebrates lacking wings and other animals which were physically unfit for sea travel.

The geological history of Fuerteventura, after the island was formed, is complex and cannot be fully explained here in detail. Some aspects will be discussed in the following chapters however, many details are still not known in enough depth.

Nonetheless, it is important to know that the island came to be considerably larger than the dimensions that we know today. Geologists estimate that the central structure, currently the area of Pájara and Toto, might have reached 3,500 m altitude, and that Jandía, with its highest point of just over 800m today, was also three times higher. The final constructive phase was not as violent as the early stages, where tremendous explosions, caused by steam heated by the volcano, erupted out of the sea. The latter stages were filled with gentler eruptions whereby lava, coming out of volcanoes already partly eroded, piled one layer on top of another at irregular intervals adding new layers to the „cake“.

In times of scarce volcanic activity the structures were dominated by other forces which eroded their existing forms and the runoff of rainwater carved deep ravines. Gradually, the destructive forces prevailed. At various stages, similar to those found today in Gran Canaria and La Gomera, numerous gullies depart radially from the peaks. There is also a stage of even greater erosion which is clearly visible today in Fuerteventura, where all that remains of the old volcanic edifices is isolated in its periphery, known as „knives“. A particular example of this, which will be discussed in the corresponding chapter to this area, is that of Jandía. The powerful early volcanic activity has ceased, leaving Fuerteventura now in a phase of residual volcanism which has in recent geological times hit parts of the north and centre of the island, creating extensive „Badlands“ of lava. Not however in Jandía, where there hasn´t been any subsequent rejuvenation of the Miocene shield phase.

Climate

In general, due to their oceanic situation and subtropical latitude, the Canaries have a Mediterranean climate. This means they have hot and dry summers and mild and moderately humid winters. Obviously, the tourism slogan of „eternal spring“ is not entirely true, but it is true that the ocean exerts a soothing effect like a shock absorber, reducing extreme temperatures for its neighboring continental areas. The general rule varies widely depending on the distance of each island from the African continent, oceanographic features of the sea surrounding each island and above all, orographic factors such as altitude and exposure.

Fuerteventura together with Lanzarote is the driest island in the Canaries. This is in part due to its relative proximity to regions of desert on the African continent, whose dry and frequently high air pressure can block the arrival of storms, which are most active in the more oceanic western part of the archipelago, to the Occidental islands. Furthermore, Fuerteventura is the oldest island in the archipelago and has been strongly affected by erosion, which has resulted in a gently hilly terrain and low altitude. In summer, the `sea of clouds`, formed by the rise of the humid air from the trade winds which are so characteristic of the northern mountain slopes of the central and western islands, directly affects small areas of the higher mountains. However, its influence there has a great effect on the vegetation. It is often said that „the trade wind passes over the eastern Canaries without any effect,“ but this is by no means the case.



The arid landscape makes up most of the island

Temperatures

The average annual temperature across Fuerteventura at sea level is approximately 20.5ºC. Theoretically, it decreases with altitude at a rate of 0.66ºC every 100 metres, so that in the case of the Pico de la Zarza (807m), the highest part of Jandía, the average annual temperature would be 14.8ºC. At sea level, the highest monthly averages are in the month of August at 25°C, and the lowest in January at 17°C. These monthly averages also decrease progressively with altitude.

The average annual variation in temperature is around 6-7ºC on the coast, while further inland it is slightly higher around 7-8.5ºC. The average daytime variation in temperature is quite similar, being around 5-6°C in coastal areas and 7-8.5ºC inland (all data Höllermann, 1991). At sea level, the absolute minimum temperature is around 5°C, and the absolute maximum around 44ºC. However, neither extreme is reached every year. There isn´t any concrete data, but by extrapolation it can be assumed that the absolute minimum winter temperatures of between 5-10°C may be quite common in the highest part of Jandía. The existence of exceptional light frosts of short duration cannot be ruled out. The absolute maximum temperatures are most likely well below that of those achieved on the coast

Rainfall

With 134l/m2 average annual rainfall across the entire island (Marzol Jaen, 1988), Fuerteventura has the least rain of all of the islands in the Canarian archipelago. According to the same source, at no point on the island does the annual average reach 300l/m2, but varies from 50l/m2 at the Lighthouse Entallada to just over 250l/m2 per year in the mountains near Tetir.

Rainfall data is available from a network of forty eight measuring stations spread across the island. The data from six of these stations was given to us by the island´s Water Board. Three of them are in Jandía while the remaining three are set in places close to this peninsula, which can be used for comparison:

Name	Code	UTM Coordinates	Altitude	Series	Average
Morro Jable	005	563501/ 3103021	30	1947-2003	91,2
Ugán Cortijo	017	578237/ 3124648	61	1956-2003	75,4
Tarajalejo	039	585845/ 3119272	72	1970-2003	72,5
Costa Calma	040	575670/ 3114417	20	1975-2003	97,8
Tamaretilla	041	585692/ 3124440	115	1970-2003	105,7
Faro Jandía	042	- - - - - - - - - - -	10	1970-2002	59,1

All these stations are located below 100m above sea level except in Tamaretilla where it slightly exceeds this level. No exact rainfall data is available from the summit of Jandía so approximations are reached by interpolation. According to Marzol Jaen, the summit is above the isohyet of 150l/m2 per year. According to the author, no region of Fuerteventura receives significantly more than 250l/m2 per year. The highest point of Jandía, between the Pico de la Zarza and Pico Mocán, could present values between 200 and 250l/m2 of precipitation as rain or occasionally hail.

Wind

In the Canary region, the prevailing winds are (in order in terms of days per year):

1. Winds from the NE (trade winds): cool, wet, blowing regularly in the summer months.
2. Winds from the E: characteristic of situations where the anticyclone of the Azores moves towards the Sahara. They can occur at any time of the year and bring dry and warm continental air which can carry airborne dust from the Sahara desert.
3. W-SW winds: associated with Atlantic storms, which bring rainfall of varying intensity.
4. Winds from the S.

The general outline of the winds in Jandía follows this pattern, but locally the direction of the wind can suffer strong variations from the original direction, mainly because of the topography.



After heavy rains the water runs down the ravines

LIVING THINGS

History of the biological population

Early Fuerteventura became inhabited very gradually. Invertebrates, reptiles and mammals floated in with vegetation which was dragged in from the rivers of North Africa. While some plants were brought over by wind and sea currents, many birds flew across from other continents where they had eaten fruits from various plants, therefore allowing the seeds in their droppings to germinate on the island. The considerable height that the island once reached, coupled with the fact that the Miocene climate was warmer and wetter than that of today, made Fuerteventura richer in different habitats, vegetation and fauna then than nowadays. It was probably partially covered by rain of laurel-forest, a type of vegetation which then spread across North Africa and southern Europe, and even possibly with dry forests such as the Canarian Pine.

Later the conditions began to change, leading to different climatic periods in which life forms evolved adapted to each period. It's certain that Fuerteventura, throughout its long history, has seen an endless amount of plants and animals which are now extinct or which only remain as fossils. That at least lets us know of their existence. An example of these species that left their mark is the land tortoise that inhabited the island in the Miocene and in the following Pliocene geological period. Shells of their eggs were found in the Barranco de Los Molinos and Puerto del Rosario. Some of these extinct species are undoubtedly the ancestors of others still living on the Canary Islands today. A concrete example: research based on molecular genetics indicates that all species of Canarian lizards, both extinct and living, including the giant lizards of El Hierro, La Gomera and Gran Canaria, are all descendants from a common ancestor which arrived to Fuerteventura twenty to twenty one million years ago from North Africa.

Aboriginal pot located in a ravine in Pájara. Cultural deposit.



History of the human population

The marine vocation of Mediterranean cultures contributed greatly to the Canary Islands being known early on. This is accentuated if we consider the fact that Fuerteventura and Lanzarote are both visible from the African coast on clear days. However, since late antiquity the archipelago had been forgotten, until the Middle Ages when they were rediscovered by Genoese sailors like Lancelotto Malocello, who arrived in Lanzarote. Other seafarers and Majorcan, Andalusian, Basque, French and Portuguese merchants all landed on the islands and in the early fifteenth century the Norman and Spanish occupation and subsequent conquest of the islands began. The Norman expedition, led by Jean de Bethencourt and Gadifer de la Salle, reached La Graciosa and Lanzarote in the summer of 1402, and then continued on to Fuerteventura and El Hierro. The conquest by other Castillian armies, which lasted around a century in total, concluded in Tenerife in 1496. Once completed, the European population living in the Canaries undertook short trips to North Africa to capture Moorish slaves to work in the new economies that started up after the conquest.

In respect of Aboriginal culture, we know that in ancient times the first groups of humans to populate the islands came over from North Africa. Genetic studies speak in favour of this as does the presence on all of the Canaries of Libyan Berber scripts which are native to the African continent, along with various material signs of culture and place names. The arrival of Libyan people from North Africa is related to historical events in the neighbouring continent, linked to the process of Romanization and of certain opposing tribes submitting to Rome. However, the population of the Canary Islands was not a straightforward or synchronous event, but one which was lengthy and intermittent over time, where the Roman civilization would play a principal part in the move. The islands were populated by North African tribes who were unaware of navigation, so they had to be brought in by Roman ships. Many of the Berber tribes from the North African area, such as Bimbapes (El Hierro), Gomeros (La Gomera), Benahoaritas (La Palma), Guanches (Tenerife), Canarians (Gran Canaria) and Maxies (Fuerteventura and Lanzarote), started to populate the islands. These last two were populated by the same tribal ethnic group, sharing a writing system, the Libyan-Canarian, which currently remains exclusive to them both, and also the footprint figurative rock engravings which are unique to the Canaries.

Fuerteventura has many archaeological sites from its Maxie culture, some relevantly complex. These are places where indigenous people lived, buried their dead, worshipped their gods, made decisions, wrote, left their footprints, carved their idols and exploited natural resources to produce pottery and stone tools. Livestock farming was also an important activity, especially of goats and sheep, which developed throughout the island´s territory.

This Aboriginal culture adopted a dual political organization, at least near the time of the Norman Conquest. Commanding each of the two tribal factions were Guise and Ayose. A head chief or king had command and was assisted by a body of Altahay warriors. Each of them managed a territory and between them they administrated the peninsula of Jandía, where the guanil or free cattle grazed.

Archaeological dig in the Barranco de Mal Nombre, Jandía.





Partial view of the top of Montaña Cardones, aboriginal sanctuary.

Pájara belonged to the realm of Ayose or Yose, except Jandía where both leaders exercised their control. La Pared (the Wall) of Jandía separated the communal territory belonging to each of the two kingdoms.

Livestock was the basic economy, organized through a complex of coastal farming areas, rotating the culture, economic and social life around the goats. It was a segmental and equalitarian society that often had to resolve disputes over cattle, water and grazing areas.

Organized into extended families, they lived in settlements in Risco del Carnicero, Mesque, Lomo de la Cueva, Corrales de La Hermosa, Degollada de las Bobias, Munguia, and Cofete, amongst others. They occupied hilltops, hillsides and interfluvial ravines. People lived in villages, believed to be in smaller concentrations, as well as in isolated dwellings. From the sources, through the middle courses and at the mouths of the rivers in the succession of valleys in Jandía there were settlements and villages, while in Pecenescal, Los Canarios, Esquinzo, Butihondo, Gran Valle and Jorós are examples of valleys which were also occupied. The more complex settlements were made up of small structures with one room (for sleeping), a stable for the livestock, circles of stones standing upright and circles of cobbled paving stones (for worship), mound type structures (for burial) and seats (probably for political purposes). There were other buildings like the „tagoror“, where political meetings would be held. The homes were on one level in an oval, attached to one another, allowing communication with each other through a communal area or patio. They had arched ceilings making it easier to form rows and to make them more comfortable.

Some settlements had a higher amount of livestock which accounts for a high number of buildings for the animals, which, for example, was the case in Corral Blanco. The burial chambers in tubular structures form part of the architectural layout of the settlements. However, there are also burial mounds on the tops of mountains such as the Gran Montaña o Melindraga, on the coast on the Playa de Juan Gómez or Cofete, or in small hollows on the slopes of the ravine, as is in the case in Esquinzo and Vinamar.

The circles of standing stones are slightly ellipsoidal constructions, always oriented east-west, and consist of a single row and a single or double row of standing stones. They would be used as temples and would form part of the settlements, although they could also be

isolated, as is in the case of Las Hendiduras. Others, such as those of the Degollada de las Bobias, were organized into a mound shape. Montaña Cardones is a complex archeological site with both magical and religious connotations. La Iglesia de los Canarios, el Cementerio de los Niños, Cuevas Labradas are all found in its higher points. The Castillete – left in ruins by natural causes – is made up of mounds, circles of standing stones, natural caves which have been adapted for residential and/or burial purposes, and piles of stones the function of which is unknown, although they appear to be linked to cultic practices. From historical references it is known that the giant Mahan's tomb is located here. An altitude of 691m above sea level and orographic profile of the mountain make it a significant landmark in the island's geographical relief, which is made even more significant by the fact that the summit is visible from the majority of circles of standing stones in central and southern Fuerteventura.

It was near this mountain sanctuary that the Virgin appeared and the event was recorded by the French researcher René Verneau in the nineteenth century.

Aboriginal people went to specific places such as Vega de Rio Palma and La Campana in Jandia, to make noises with the stones, as a way of worship and of communication. They are known as ´Litófonos´. They also used the Libyan-Berber and principally the Libyan-canary alphabet. Morrete de laTierra Mala is a peculiar rock location where both spellings are represented.

We also know that the ancient people used a considerable amount of plants. They utilized their leaves, fruit, roots and rhizomes. They chewed them, as in the case of the sow-thistle, collected their rhizomes (Batatilla fern), prepared teas (altabaca) and infusions (smooth periploca) and toasted their seeds (ice-plants).

They hunted birds – various shearwaters and doves, Canarian quails and many others. Some are now extinct but their bones form part of the archaeological sites. This activity was exercised especially in areas where birds gathered to drink, making their capture relatively effortless. This is the case of Veril Manso and Manantial de Agua Cabras.

They also collected and consumed seafood. As a result they left piles of shells, which are in themselves evidence of hunting. The consumption of poultry and fish complemented their basic food supply which was derived from sheep and goats. With their milk they prepared multiple meals, some of which were also used for medicinal purposes. Colostrum, milk, whey, curd, cream, butter, lard, oil, fresh cheese, cured cheese and other denominations which make up a very specific and rich semantic field, which is a clear reflection of the deep knowledge and understanding of these animals.

Note: The law protects all archaeological and paleontological sites on the island. It is strictly prohibited to scratch, paint or collect rocks or any archaeological material such as ceramics, stones, bones, shells or of any kind.

Engraved at the foot of Castillejo Alto made using the percussion technique. These figures sanctified the land.



Biodiversity

While it is true that Fuerteventura has lost much of its wealth of different plants and animals, known together by biologists as „biodiversity“, this does not mean that it is currently a poor island without species of interest for studying or conservation. On the contrary, Fuerteventura has a unique species of birds: for example the Canary Stonechat. It is also home to the only viable population of Aegyptian Vultures in the archipelago, has good populations of steppe birds and a reptile named Simony‘s Skink, which until recently was considered endemic but was also found a few years ago in Lanzarote. There are many unique endemic species of invertebrates, and in the plant kingdom, twelve species of endemic vascular plants and a moss that has so far, worldwide, only been found in the mountains of Jandía. In addition, due to the arid climate currently prevailing in most of Fuerteventura (except on the highest peaks), the island has the highest percentage of plants in the archipelago which were originally from the North African Sahara.

Canary Stonechat or `tarabilla canaria`



But we will try to give some order to this diversity. To do this, we will explain various concepts and then below we will also make a brief foray into the inevitable statistics, also featuring some pictures which allow us to see at a glance some of the flora and fauna representative of Fuerteventura in the context of the archipelago.

Potential natural vegetation is the type of vegetation that is consistent with long-term natural conditions of a given territory, especially climate and soil, which exists without incurring any modification or damage from external factors. If this occurs, a replacement vegetation is established. On many occasions, the disturbance or interventions are caused by human beings (for example with the introduction of alien species), but they can also be natural (natural fires, volcanic eruptions, landslides etc). Once the interventions have ceased, the replacement vegetation evolves slowly back into the potential natural vegetation. If we cut down a forest for example, herbaceous plant communities will be established at first which will gradually transform into bushes and young trees of the same species that lived there before. After many years (sometimes even many decades) they reach adulthood and with that they restore the original state of natural balance.

Most of the vegetation of Fuerteventura is replacement vegetation, because human intervention on this territory has been intense and continued for over two thousand years. The large areas covered with Spiny Lettuce, saltworts and boxthorn are found across much of the island and are a type of replacement vegetation that is in balance with the current use of the land, especially extensive animal-husbandry. It can support the animals, even in high density and regenerate without problems. However, if grazing ceased in many areas this low shrub vegetation would slowly evolve back into the potential natural vegetation. Some remain better preserved than others, for example palms and Canary Island



Goats roaming free across the mountains near Pajara.

tamarisks in the valleys, areas with olive trees and Mount Atlas Mastix-Tree in mountainous areas and especially Canary Island Cactus-Spurge and Jandía-Spurge on these peninsula of Jandía and Montaña Cardones) and balsam-spurges.

These the balsam-spurges even cover relatively large areas on the slopes of the Massif of Betancuria, for example between Toto and Pájara. On some parts of these slopes remains of ancient farming terraces can still be seen. These were built in areas of balsam-spurges, displacing the vegetation, which, even though the terraces are no longer in use, still hasn´t recovered its lost territory.

Traces of potential natural vegetation in the Valle de Terequey y



Biodiversity hotspots

Obviously, different plants and animals are not distributed evenly across the territory, but occupy the specific habitats to which they are adapted. However, there are regions in which a particularly high number of species are concentrated. This can have several causes. Usually, it is due to a habitat with favorable conditions of humidity, temperature and other factors, which has remained stable for a long time without a significant variation. In these conditions therefore rich and diverse plant and animal communities are allowed to develop. Biologists call these areas „biodiversity hotspots“. In Fuerteventura, areas which stand out in this sense are the mountains of Jandía, located in the municipality of Pájara, as well as the Massif of Betancuria and the mountains of the East and North of the island

Comparative table of numbers of species of flora and fauna in the Canary Islands and Fuerteventura. The specific grouping may refer to species endemic only to Fuerteventura or to this and various islands.

GROUP	CANARIES	FUERTEVENTURA	ENDEMICS
Birds	105	51	1
Mammals	21	9	1
Reptils	18	3	3
Amphibians	3	2	0
Archnids	975	85	74
Insects	6138	1440	340
Mollusks	286	41	32
Fungus	1893	48	1
Lichens	1548	215	8
Mosses and Liverworts	503	128	2
Ferns and similas	64	16	0
Flowering plants	2027	732	78

Source: Arechavaleta, M., S. Rodriguez, N. Zurita & A. García coord. 2010, Lista de especies silvestres de Canarias. Hongas, plantas y animales terrestres. 2009. Gobierno de Canarias - *Simplificada*

Flowers of the Mocan





Community of Lax-Flowered-Monanthes and Macaronesi-an Polypody in the mountains of Jandía.

Pájara - the largest municipality in the Canary Islands

With an area of 383.52 square kilometres, Pájara is the largest municipality in Fuerteventura and in the Canary Islands. Located at the southern end of the island, it is a long narrow peninsula with a winding profile and accounts for almost a quarter (23.11%) of the island´s total surface. It also has the largest municipal perimeter of the archipelago, 163.56 kilometres. Its profile, mainly coastal, allows you to enjoy an almost untouched 136.13 kilometres of coastline, the place with the longest stretch of beach in the Canary Islands, about 70 linear kilometres. They are vast and unspoilt beaches, with fine golden sand.

The municipality has 19,679 inhabitants (2014 census), 20.1% of the island´s population. The majority are young (average age 33.7 years) and a large proportion are foreigners (one third of the census). The current census is far from what it was previously: in the late eighteenth century Pájara had only 1,500 inhabitants, a figure that remained virtually unchanged until 1940, when the census then became stuck on 1,345 people. Thanks to the tourism boom, in 1980 the municipality achieved double this figure and from the year 2000 the statistics shot to the current status. However, most of the population is concentrated in the resorts, which explains the maintenance of a low density of land occupation, 51.3 inhabitants per square kilometer, far from the 3,802 inhabitants per square kilometer in the municipality of Las Palmas in Gran Canaria, to give an extreme example.

The town of Pájara is the oldest village in the municipality and therefore the capital and home to the town hall and the parish. It is not actually known when or who founded the town, which for centuries was practically the only major urban settlement in the south of Fuerteventura. It is also unknown why a name which is generic to fauna and unique as a Spanish place name, was chosen. In 1711, when Pájara was able to segregate its own parish, consecrated in 1708 to Nuestra Señora de Regla, matrix parish of Betancuria, the town already had a long historical path. It became one of the most important villages on the island alongside Tuineje, Pájara, Antigua and La Oliva. Very probably it came shortly after the end of the Spanish conquest of Fuerteventura, and would have been led by the most audacious settlers who, despite the risk of periodic attacks from Barbary pirates, dared to leave the mountain refuge that was offered by the nearby Vega de Rio Palmas and searched for fertile farmland in open places. The first houses gave way to the first groups of houses and in the seventeenth century a town was formed around a chapel, the predecessor of the current church built in 1650.

The location of Pájara was not choosed by chance.The village was set exactly at the point where several ravines connect, convening them into a single channel rightly named „de Pájara“ (from Pájara).

Why was the first village of the future municipality founded here? There were two main reasons. Firstly, the presence of shallow groundwater, an indispensable resource to ensure the survival of the population and secondly, the existence of agricultural land. The latter was necessary to allow rain fed agriculture based on the use of ´gavias´, a food supplement complementary to the animal-husbandry which had predominated before. There was also a clear strategic interest. In this place three arteries are forced to convene together to form a „Y“ junction. The two major paths lead to the port of La Peña (Ajuy), from where most of the commercial trading of Fuerteventura took place. These two paths come from the interior of the island, from the plains of Tuineje and through the Degollada de Sise, descending from Vega de Rio Palmas and the old capital of Betancuria.

This is therefore in an important area, which thanks to the presence of water and arable land, is the most fertile part of the South of the Majorero Island. It is located at the foot of some of the most towering heights on the island, for example the Great Mountain (711 metres). Further south there were only a handful of small settlements in areas lacking in natural resources, with economies largely marked by livestock farming or fishing such as Cofete, El Cardón, Las Hermosas and La Lajita.

Another fundamental historical fact for Pájara was the creation of the Dehesa de Jandía and its subsequent conversion into private property under the control of Gustav Winter, the man who surprisingly developed this part of the island during the second third of the twentieth century

and was responsible for its current transformation into a tourist centre of international importance.

When tourism came to Pájara investors only selected its eastern coast. This has helped maintain an area with only scarce human habitation, to be kept safe from development projects across the mountainous interior and the west coast and extreme southern end of the island. In 1987 approval by the Canarian Parliament of the Law of Natural Spaces of the Canary Islands (LENAC) allowed some control over the progression of a development that threatened the main natural treasures of the municipality, unaware that this resource is precisely what makes it an attractive alternative to the overexploited attractions of a sun and beach economy. Two years later, the Law 4/1989 of Conservation of Natural Areas and Wild Flora and Fauna marked the legal management of natural resources in Fuerteventura and other places, establishing different categories of protection. After reclassification of protected areas in 1994, Pájara has become the municipality with the highest protected area in the Canary Islands, which gives an idea of its tremendous natural importance. There are in total more than 37,000 hectares of land, 48.9% of the total area.

We also have to take into account the Natura 2000 network, the main instrument of the European Union to avoid reduction of biodiversity as a result of certain human activities. The network of spaces that are integrated in Natura 2000 define a new figure called Sites of Community Importance (LIC) and integrates the Special Protection Areas for Birds (SPA) as defined in Directive 79/409 / EEC on the conservation of wild birds, known as the Birds Directive. These spaces, therefore considered of European importance, have a high representation in Pájara.

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Network of natural areas of the Canary Islands in Pájara

Jandía Nature Park

14,318 hectares, nearly a tenth of the island of Fuerteventura and wholly in the municipality of Pájara.

Rural Park Betancuria

Of its 16,544 protected hectares, 3,054 belong to Pájara.

Natural Monument Montaña Cardon

1,269 hectares, all in Pajara, dedicated to the protection of this unique summit.

Natural Monument of Ajuy

The smallest on the island but no less interesting, occupying 31.8 hectares which in turn form part of the Rural Park of Betancuria.

Spaces of NATURA 2000 network

Cueva de Lobos LIC (ZEC) ES7010014

Jandía. LIC (ZEC) ES7010033 y ZEPA ES7010039

Montaña Cardón LIC (ZEC) ES7010034

Playas de Sotavento de Jandía LIC (ZEC) ES7010035

Playa del Matorral LIC (ZEC) / ZEPA ES7010042

Tourism and nature are found in the Playas de Sotavento





Barlovento, Windward Coast south of La Pared

Isthmus of La Pared

The isthmus of La Pared is easily reached by the FV-2 which runs through its entirety. Most of the space forms part of the Natural Park of Jandía.



Partial view of the isthmus from Morro de Rinconcillo to the North

A sea of sand

The isthmus of La Pared is a vast area covered with sand which links Jandía to the rest of Fuerteventura. It is the narrowest stretch of the whole island, just four kilometers of low lying plains, but enough to separate the two coasts and to unite the two old volcanic structures (that of Jandía and the central structure) which millions of years ago stood as two separate islands.

The southeast coast of the isthmus, the leeward side (Sotavento), is low lying with extensive beaches and gently sloping hillsides which ascend inland. In its central parts the isthmus is fairly flat, with only a few highlighted elevations such as Alto de Agua Oveja, Degollada de los Mojones, Loma Negra and Risco del Paso, none of which reach 350m above sea level. Further the ground begins to slope again towards the northwestern coast (the windward side "Barlovento"), pronounced, ending with a small cliff. There, rocky sections alternate with beautiful small sandy coves. Where do these enormous amounts of sand come from? It is not uncommon to hear the misguided idea that it has been brought over by the wind from the Sahara desert. In reality, most of the grains are too big and heavy to be carried by the wind such a distance. Looking at them in greater detail, for example with a magnifying glass, we can see that really they are tiny fragments of shells, snails, calcareous algae and foraminifera. The latter are microscopic protozoa with a calcium carbonate shell.

About 5 million years ago, at the time known as the Messinicum period, covering the end of the Miocene and early Pliocene Periods, was a period of hundreds of thousands of years with tropical weather and high sea temperatures. In the shallow waters that surrounded the young island of Fuerteventura organisms with carbonate shells proliferated and were slowly ground down by the motion of the sea creating large quantities of sand. There hasn´t been any other comparable formation period of sand, not in intensity nor duration, since then, but of course mollusks and other marine animals with shells, empty after the death of their occupants, are crushed by the pounding waves and add to the existing deposits of sand.

Therefore the sand is of organic origin, calcareous sands originating from the island itself. Accumulated they form a ´Jable´. This word is a ´Canarianism´ of French origin (derived from ´sable´, sand) and is designated to the great sandy areas, which in some areas may be more than 90 meters deep, in Fuerteventura. The existence of this ancient name is in itself a linguistic treasure and it reminds us that Lanzarote and Fuerteventura were conquered in the early fifteenth century by Norman troops commanded by the mercenary Jean de Bethencourt.

During the long tropical period, the sea level was considerably higher than it is today. The Messínicum era was followed by a period of alternating ice ages with warmer periods interspersed between them. When the sea level fell during periods of cold climate, the wind pushed large amounts of sand from the now bare and dry shelf zone arround the island into the internal parts of the island.



Land snail fossils and fragments of basalt stone

Much of Fuerteventura has been covered by sand several times, except for certain higher mountains. This is clearly demonstrated in many parts of the municipality of Pájara and in other parts of the island, by the presence of various layers of sand from different ages.

When mixed with clay and stones they are transformed into soil, easily distinguished by its light colour. Some of these ancient sandy areas have hardened, so much so that they have carbonate crusts which are found in many places and locally called “caliche”. This limestone was used in the past in lime kilns. In contrast, the most recent sand layers, those corresponding to the last ice age a maximum of about 18,000 years ago, still have a loose sandy texture.



The wind is almost constant in the isthmus, especially in spring and summer. Even during the arrival of hot air from the Sahara, a remnant of the trade winds is often left in the lower layers of the atmosphere, a thin layer of moist and fresh sea air on which rests a layer of warm, dry air with a continental origin. This weak layer of fresh air can pass through the isthmus with few obstacles, but not through the rest of Jandía. This means that a comfortable temperature can be found in Costa Calma while in Morro Jable a torrid heat. Also during this situation mist condenses and forms clouds in the lower lying mountains of the isthmus. This causes a strange effect on the landscape in these places which are usually clear. This situation however, does not occur often enough to cause a major development of vegetation.

Giant dunes near the coast of Sotavento



La Pared, the wall that divided two kingdoms

According to the chronicles of the conquest of Fuerteventura, a solid impenetrable stone wall ran across the northern part of the isthmus. To the north layed one of the primitive aboriginal kingdoms of Guise, while to the south was the domain of Ayose. Today, only some of the lower sections of the wall remain visible in certain places, while in many others it has completely disappeared. It extends roughly from Matas Blancas to the area of La Pared, passing north of the existing road between the two towns. In some places the remains are accompanied by thickets of wild Indian prickly pear cactus planted at the time of the last tenant of Jandía, Gustavo Winter: discussed in the chapter about Cofete.

Some archaeologists believe that the wall across the isthmus did not divide the two kingdoms of the ancient ´Majos´, and that this boundary was in reality set much further north, at the height of La Torre, near the current airport. The wall of the isthmus actually served to define an area of common use for the inhabitants of both territorial areas that covered the entire peninsula of Jandía.

Traditionally, due to its good pastures, the isthmus has always been used for cattle. Just a few decades ago there were hundreds of camels here, but nowadays, there are mostly goats. However, in recent years the number of grazing cattle in this area has declined significantly. This is due in part to the frequent theft of animals that occurs in this vast area, which is easily accessible and difficult to control on a permanent basis therefore forcing farmers to take their goats to safer areas.

Another interesting detail is the large number of shells of limpets and mussels that can be found in small piles spread along the entire coast of the isthmus, mainly on the Barlovento side. Known as shell middens or mounds, they are evidence of the regular consumption of these mollusks by the Majoreros from pre-European times. Formerly this was an abundant resource which was easy to extract. It was an interesting complement to fishing and an always much appreciated delicacy for the locals. Population growth in Fuerteventura and a passion for this delicacy has largely diminished populations.

One species, specifically the one that was most abundant, has been the worst hit. This is the Fuerteventura-Limpet, endemic to Macaronesia, with populations restricted to the Islas Salvajes and Fuerteventura. Today it is easier to find their shells in one of these old shell mounds than on the rocks on the shoreline.

In many parts of the isthmus there are traces of the activity of the pre-European inhabitants.



Places of interest



The prisoners' path

In some areas of the isthmus near the GR 131 there are vestiges of historical value dating back to times of the dictatorship of Franco: fragments of the „Prisoners´ path". This route is approximately 1.5 metres wide and crosses the Isthmus following the course of the west coast and is made up of flat pieces of limestone.

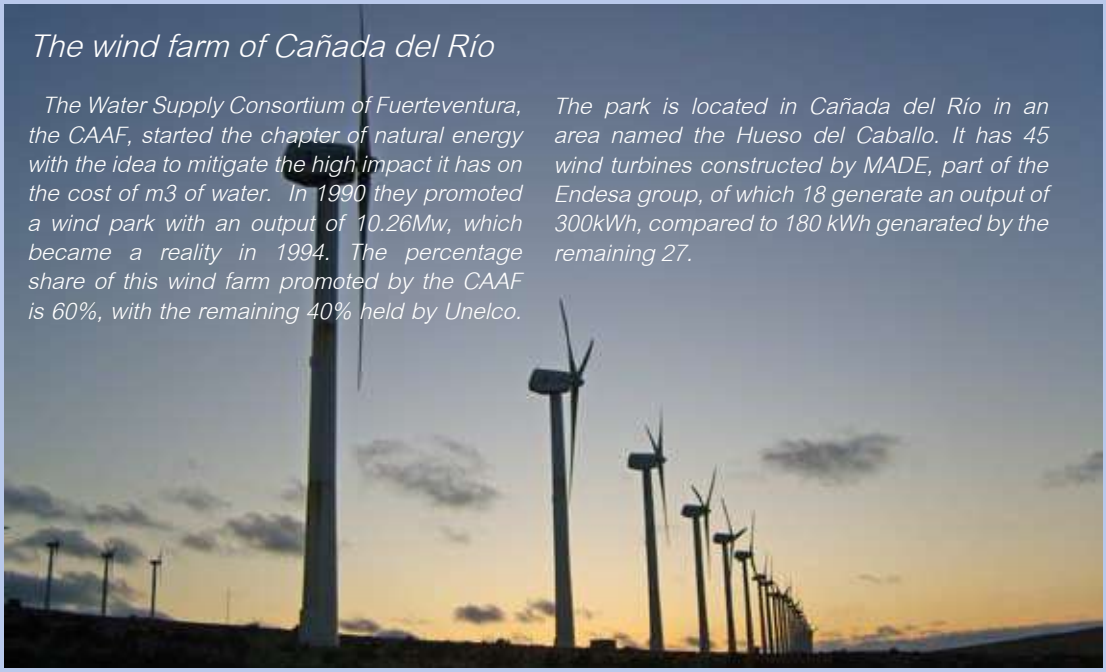
The interest that the Nazis had in Fuerteventura and the plans made by Gustav Winter and the fascist military have been repeatedly documented. Thus, in the years 1946 to 1948 Franco, at the request of Winter, sent his political prisoners who were detained in a camp in Tefia (now a youth hostel), down to Jandia. The prisoners were sent to the south in order to pave, by hand, a road which runs several kilometres and that Winter needed to improve communications between the Jandía peninsula, which he had leased, and the rest of the island.

Today the road is barely recognizable, as the sand with its constant movement has covered it and the past with a thick cloak. But in some places, like here at the end of the barranco de Pecenescal ravine, the prisoners´ path is still clearly visible. Its route very roughly coincides with the GR (Grand Tour) 131 from La Pared to Pecenesc

The wind farm of Cañada del Río

The Water Supply Consortium of Fuerteventura, the CAAF, started the chapter of natural energy with the idea to mitigate the high impact it has on the cost of m3 of water. In 1990 they promoted a wind park with an output of 10.26Mw, which became a reality in 1994. The percentage share of this wind farm promoted by the CAAF is 60%, with the remaining 40% held by Unelco.

The park is located in Cañada del Río in an area named the Hueso del Caballo. It has 45 wind turbines constructed by MADE, part of the Endesa group, of which 18 generate an output of 300kWh, compared to 180 kWh genarated by the remaining 27.



Vegetable Hedgehogs and Saharan flowers



Black Saltwort



Western Restharrow or `Coeso`



Yellow Cistanche or `rabo cordero`

There is life in the desert. Part of the vegetation remains green all year round despite the hardness and extreme aridity of the environment. It mainly consists of shrubs well adapted to living on sand. After the rains in spring they are joined by other annual herbaceous species and if rainfall has been plentiful that year, beautiful multicolored floral tapestries are to be seen. Among the shrubs distinguished by their abundance are the Black-Saltwort and the Western Restharrow also known as “coeso”. The first is endemic to the Canary Islands, but there are other closely related species found in North Africa. It grows across the full extent of the isthmus, although it grows best in the valleys of the eastern part, where it is better protected from the wind and the moisture stays longer in the deep layers of the sand. In these places the Black Saltwort grows to 2.5m tall and forms a dense thicket. In other areas of Fuerteventura and on the other islands this species tends to be much smaller and grows close to the ground. In October and November the bushes are covered with what appears to be small white or yellowish flowers.

In reality the bushes had already bloomed in summer but were hardly noticeable. What we see now, which can be easily confused with flowers, are membranous discs around young fruits.

The coeso, part of the legume family, is found throughout the area, but is more numerous in the relatively high plains of the south-western part of the isthmus. It is also a faithful companion to the road that runs through the Jable (sand). Its small leaves are covered with glandular hairs which give it a tacky feel and, living on the Canary Islands and in North Africa, its flowers, which appear especially in winter and spring, are an intense yellow.

On the slopes that descend to the western coast of the isthmus, heavily beaten by the wind, we find Leafy Sea Spurge in abundance. In winter it is here where we can find colourful caterpillars of the Spurge Hawk-moth, which feeds on its leaves. In some areas of the central plain of the isthmus they are also mixed communities of Sea Spurge and Knot-Flowered Ice-Plant

Not lacking in the isthmus is the Spiny Lettuce, the Mediterranean Saltwort and the Boxthorn, common and abundant throughout the island.

We also find Yellow Cistanche, a parasitic plant which grows at the roots of the Saltworts and other shrubs. Its bright yellow inflorescence can be seen in winter in many areas including along the road that runs through the isthmus, but during the rest of the year only the thick roots remain, buried in the sand. Another similar plant, but one that is parasitic to the Spiny Lettuce, whose flowers are sky-blue, is the Graciosa-Broomrape. However, in the isthmus there are two species which stand out for their uniqueness: Medusa‘s Head Bindweed and Burchard‘s Fleebane

The Medusa‘s Head Bindweed

In the winter of 1858, the English botanist and priest Richard Thomas Lowe came to Fuerteventura to study the flora and vegetation. He had heard of a plant called “Chaparro” which grows in the vast sandy plains, but did not know what species it was. So he decided to investigate.

At that time travelling long distances around the island was very tiring. Lowe would later relate how he left Betancuria on horseback early in the morning with his guides and rode through „a seemingly endless succession of dry gullies amid an arid and rocky pathless wasteland.“ After six hours of travelling, when he was just about to leave and start his journey back, his guides showed him his first Medusa‘s head Bindweed. It was in the Jable of Vigocho, where even today a remarkable colony of this plant thrives. Another important colony is located in the north-western part of the isthmus in La Pared.

Lowe found that, after a close and detailed examination of these compact bushes, which from afar are easily mistaken for stones covered with grey lichens, they were a species previously unknown to the scientific community. He described it with the name of *Convolvulus caput-medusae*. Numerous species of *Convolulus*, spread across much of the world, are generally climbers. At first glance, nothing seems to indicate that the thorny Medusa‘s Head Bindweed, a strong Hedgehog-like plant, is related to them. It is only the structure of their flowers, white or pink bells, a centimetre in diameter that appear between March and July that reveal the identity of its botanical family. In the deserts of North Africa and the Middle East there are some *Convolvulus* species that look similar to our Medusa‘s Head Bindweed. *Caput-medusae,* means „Head of Medusa“ and refers to the many small branches which stick out in all directions, like the snakes on the head of the legendary monstrous woman of Greek mythology.

Everything on this plant is adapted to the rigors of a desert climate with strong sunlight and almost constant winds. A thick taproot deep in the ground keeps it firmly anchored down and its pointed branches offer some protection against herbivores. The dense and short silvery hairs that line the small leaves reduce the impact of the sunlight. However, all this does not protect the Medusa‘s Head Bindweed from human beings. Like other plants, it was used as fuel in the lime kilns. It’s dense and hard wood burns longer than that of the light Spiny Lettuce. It is therefore possible that this is the reason why the Medusa‘s Head Bindweed was exterminated in some areas. For example, according to testimonies of botanists from the time there was a large population around Puerto del Rosario in the second half of the nineteenth century. In the isthmus of La Pared and Vigocho, however, their populations have survived and today are under legal protection. Apart from Fuerteventura, the Canary Medusa‘s Head Bindweed only exists in Gran Canaria.

Flowers of the Canarian Medusa‘s Head Bindweed





Burchard`s Fleabane near La Pared

Burchard‘s Fleabane

This plant is a member of the family compositae and is therefore related to dandelions and daisies. It is an African species that grows on the sandy coast of the Western Sahara and Mauritania and is also found on the island Isla de Sal in the Cape Verde archipelago. These small bushes are rounded and compact and are covered with white hairs which can only be seen with a magnifying glass, the same as the Medusa‘s Head Bindweed, In the Canaries it only grows in a particular area of the isthmus of La Pared and two other small areas of the coast in Jandia.

The plant emits lateral branches which take root. The wind-driven sand accumulates at its base, so that eventually the retained material forms a small dune, inside which the Burchard‘s Fleabane is located. This also occurs with other shrubs that live in sandy environments like Moquin‘s Saltbush (see chapter Cofete) and the Moorish Seagrape (see chapter on Punta de Jandía). In February and March, Burchard‘s Fleabaneare is densely covered with small, bright yellow flowers.

Being seen here in such abundance makes it surprising to learn of its rarity in the Canaries. It’s true that there are a large number of individuals close to La Pared, but much of this population has been destroyed by the building and development and the rest is under threat. Its proximity to a residential area and a beach puts it under a constant barrage of traffic on many unnecessary tracks and daily walkers. The dumping of debris and rubbish also contributes to degrade the environment in which they live. It is therefore essential that visitors do not stray from the main tracks or leave rubbish behind, thus contributing to the conservation of this plant of outstanding natural value.

The green desert

A few days after heavy rain, a faint green carpet begins to appear over the top of the white sands of the Jables. It is the miracle of the desert. The subtle prairie is made up of many annual plants. One which stands out for its abundance is the blue Smallseeded Mairetis. It is yet again another species of North African origin that also makes its home on the Eastern Canary islands. Its growing season is very short, as is the case with many desert plants as they quickly need to take advantage of available resources and produce seeds for the new season before the heat starves them. In January and February they are in full bloom and sprigs which are 5-20cm high, topped with spirals of tiny blue flowers, can be seen for miles. Smallseeded Mairetis was given its

Populations of European Searocket in February 2015



spanish name due to these inflorescences which resemble the tail of a scorpion.
By March, most of these delicate plants have dried out. The plant Blue Alacranillo shares its habitat along side dozens of other sandy soil loving species: Small Hare‘s Ear, Common Needle Wort, Desert Heliotrope, Parabolic Rye-Grass and other grasses.
In wetter years, one of these annual plants which stands out above all the others in the south-east part of the isthmus is Catalina‘s Restharrow. It can form dense populations of hundreds of thousands of individuals no more than 10 centimeters high, covering large areas of land with a yellow carpet during the months of March and April. It also lives in other parts of Fuerteventura, not necessarily on sand, and in Lanzarote. Otherwise, the most similar species grow on the African continent, particularly in southern Morocco.

I prefer to walk, but I can fly

The plains of Fuerteventura and Lanzarote are home to the largest bird that can fly which lives in the Canaries. However, it does so only when it is threatened or has to travel long distances, with a slow beating of its wings and a stretched neck. The Canarian Houbara in Fuerteventura is known as a bustard, not to be confused with the European Great Bustard with which it is related and which also shares its distaste of flying. They were brought to the Canarias by the conquerors.

The Houbara (a name of Arabic origin) often moves on the ground. It is an expert in the art of camouflage and relies on its cryptic plumage with light and dark patches to make it difficult to spot amidst the bushes, especially when it stays perfectly still. They are the colours of sand, earth and stones, the colours of their environment. It is therefore possible that they can give us quite a scare as they suddenly pop up from their hiding place if we get too close. Their bright yellow watchful eyes would have detected our presence long before we got close to them. They keep a safe distance from people who enter their territory and take advantage of the Spiny Lettuce and other shrubs to walk away under cover. Chances are that during a walk through their domain you won´t not even notice their presence. In the past, before there were laws prohibiting hunting, people would approach these birds on donkeys or camels, using the fact that they are not so feared of these animals. So they could easily be shooted.

A Canarian Houbara with its perfect camouflage



In winter the breeding season begins. The males perform a showy courtship in a specific but small area. They run in circles with their head and neck thrown back, displaying the white hackles. They do this blind as their posture and plumage prevent them from seeing where they are going. For this reason they always choose the same spot for their performance, where they know every rock and bush. The females can be found on slightly higher ground, allowing them to watch the male from afar, as they become a rolling ball of white feathers that acts as a sexual attractant. At the same time, it acts as a warning to same-sex competitors not to approach its territory. As with other species in the family, the males have their small harem of females with which they mate indiscriminately, and with whom they help with the incubation and feeding of the chicks. Between January and April the females lay two or three eggs in a small hole in the ground, so well hidden that they are easily trodden on.



Two Houbaras in their habitat

Therefore, especially in breeding season, it is very important not to stray off tracks or roads. Just a few minutes after hatching from the egg, the Houbara chicks follow their mother, camouflaged in the environment thanks to an even more camouflaged plumage than that of an adult. They are so confident of the protection of their camouflage that they walk right into the path of danger believing that they are invisible. If by chance they are detected they freeze and don´t move even when touched. However, you must not move them because they have not been abandoned. Nearby, even though she cannot be seen, the mother is watching, waiting to go back to collect her chick. Taking it home or changing its environment is a serious mistake. It will be condemned to death or to live in a cage, when really it only tried to defend itself, following what its natural instinct has taught it after a long evolutionary process.

The zoological family of the Houbara is composed of twenty species living in the steppes and semi-desert regions of Africa and Asia. Many of them are under threat of extinction. The Great Bustard, somewhat larger than the Houbara, and the smaller Little Bustard, are found in the Mediterranian region. All are predominantly terrestrial birds that eat both plant matter and small animals (lizards, rodents, mollusks and insects).

Apart from the Canary Islands, the Houbara is also found in the broad arid regions from North Africa to Pakistan. There are several subspecies. The Hubara of the Canary Islands was also described as a subspecies of its own in 1894, but recent genetic studies show that it barely differs from that of North Africa. It is thus shown that these birds,that really don´t like flying, arrived in the Canary Islands by travelling the hundred kilometers that separates Fuerteventura from the Sahara, and sporadically continue to do so, preventing the genetic isolation.

The Houbara are prey for traditional hunting by Arab falconers, who use fast Peregrine Falcons as an effective weapon. Because of this persecution, carried out from the backs of camels for centuries and more recently with all-terrain vehicles and guns, they are rare in large parts of its territories. In fact, some of these hunters, related to the royal family of Saudi Arabia, have developed a breeding centre for Houbara in southern Morocco with the aim of releasing them for hunting purposes.

Several other birds which like the characteristics

of steppe plains and open spaces share the habitat with the Houbara. The most common of these is the Stone Curlew which also lives in the isthmus. All are protected species that have great difficulties surviving on the increasingly populated islands. Roads and tracks, urban and industrial areas have restricted their habitat while disturbance by vehicles and hikers who venture into the most remote places or collision with power lines are additional adverse factors. Simple basic rules of conduct can help preserve them:

1. Never go with an off road vehicle off the main tracks and in no way head off „cross country“ in areas where there aren´t any tracks. This applies to any part of the island, inside or outside of Protected Natural Areas and regardless of whether or not the Houbara can be found there.

2. Watch out while walking; if you detect a Houbara or another steppe bird, move away from them as calmly as possible and without disturbing them. Do not let dogs loose in areas where the presence of Houbara is possible.

3. These two rules become even more important in the breeding season in spring. If the bird is forced to leave the nest due to disturbances and cannot return to it in within a short time, there is a risk that eggs will be detected by ravens or other predatory birds. The embryos may also die from the cold.

Small invertebrates

As for the invertebrates, a isopod crustacean which belongs to the group commonly known as „wood-louse“, can be easily seen in sandy areas. Its scientific name is *Porcellio spinipes* and it is unique to Fuerteventura and Lanzarote. It has a striking grey and yellow colouring. In the early morning they can usually be found wandering around the sand in groups, and later, when the sun begins to heat up, they take refuge in the sand or under stones. The same goes for the tenebrionid Darkling Beetle and the Carabid B*eetle* which are both endemic to the sandy areas on the Eastern Canary Islands. The large predatory beetle *Scarites buparius*, the sand beetle, is nocturnal and also lives in arid areas of North Africa. Their powerful jaws can give a nasty bite if you try to catch them.

Cochinita de las arenas - Porcellio spinipes



Darking Beetle - Pimelia lutaria



Stone birds and carpets of snails

For some, there first steps out onto a Jable (a sandy area) can be quite disappointing. In many areas this sand is hard and you don´t sink into it as you would expect or would have seen in the movies. After thousands of years of weathering the materials have been compacted. But this hard land holds hidden treasures, animals and plants which became extinct long ago have been trapped in this space. The ancient dunes are of great paleontological interest for the abundant fossils and subfossils that they contain. Along with the different sea levels which remain well preserved in much of the island, these remains provide us with valuable information about the climatic conditions in the past, as well as the animals and plants that populated the island and its waters.

The fossil Shearwater

In 1990 a group of paleontologists found fossil bird-bones in Jandía. They belonged to a new, now extinct species of Shearwater. In spanish it was called „Pardela del Jable“. Later it was also discovered in Lanzarote and La Graciosa. The first remains were found in the area of Hueso del Caballo and in other areas of the isthmus of La Pared. The deposit consisted of various bones and shells. They were dated by radiocarbon (C-14) to between 25,000 and 32,000 years old, corresponding therefore to the last glacial period in Europe. In this time Fuerteventura was relatively cool and dry with strong winds. Later, other studies showed that at least some of the remains were even older, being more than 100,000 years.

Fossilized remains of a „Pardela del Jable“



The Pardela del Jable was a medium sized bird, somewhere between Cory‘s Shearwater and Little Shearwater. As diggers, they would make small holes - huras - in the sand where they deposited a single egg. It was a colonial bird and thousands bred in the sand. Sometimes the ´huras´ would sink accidentally or due to rain, leaving the adults, chicks and eggs trapped inside. It is these which are now appearing fossilized on the surface when the wind finally opens their graves after tens of thousands of years of imprisonment.

But the sands don´t only hide bones of extinct animals and eggs. They are actually only a small part of a giant paleontological site which, without realising its importance, we involuntarily tread on when we stray from the paths. Tens of thousands of empty shells of terrestrial gastropods, some extinct but most still present, carpet vast expanses of land. The most abundant shells correspond to the genus *theba*, but it is also common to find shells of endemic species to the Canaries such as the *canariella* and *hemicycla*.

Cells of solitary bees

Also extraordinarily abundant are small barrel-shaped structures, about 20-50 mm long and 35-50 mm wide, made of sand and silt cemented together and which generally have an opening at one end. Due to its near omnipresence in sandy areas, we will take a moment to dwell on them.

Although there is no scientific unanimity, they are generally interpreted as nests of the extinct bee genus *Anthophora,* which is currently represented by more than 450 species in the world.

Therefore, classically they are known as „Anthophora nests". The insects made these nests buried in the sand and deposited a single egg in each of them. The lateral hole is where the adult insect hatched, although closed nests can also be found.

Some estimate that others from the bee genus *Eucera* as well as other species that have not been identified were also involved. Another possibility has also recently been noted, that maybe they aren´t really nests of bees, but of locusts (grasshoppers) which periodically came (as they did until a few decades ago) in huge quantities from North Africa. Where all experts agree is in the paleoclimatic significance of the presence of these nests. They would have been built during a wetter climatic phase, with perhaps 200-500 liters of rainfall per square meter and year and therefore with greater developed vegetation than that of today. In this tropical setting bees or locusts would have searched for well-lit and warm areas for their nests, more or less free of vegetation.

The wealth of fossils has not prevented the destruction of many paleontological sites in the isthmus due to the extraction of sand for construction. The best known (and the sadest) example is Hueso del Caballo, whose dune systems were dug up in the early 1990s, about the same time that scientists recognized that they were of global significance. Despite the damage, it is still possible to find some skeletal remains of the Pardela del Jable in this area even today.

Remains of Anthophora nests





Famara-Reichardia



Spiny Lettuce



Western Restharrow



Yellow Cistanche



Catalina`s Restharrow



Burchard`s Fleabane



Medusa`s Head Bindweed



Desfontaines Seagrape



Desert Heliotrophe



Small Hare`s Ear



Snowy Small Saltbush



Black Saltwort



Smallseeded Mairetis



Parabolic Rye-Grass



Dwarf Oatgrass



Cutandia-Grass



Webb`s Sandwort



Desert Truffle



Black-Bellied Sandgrouse



Cucarro Boliche



Egyptian Flower-Mantis



„Mariadominga“ - a grashopper soecies



Porcellio spinipes



Scarites buparius

Recommended route - Istmo de La Pared

Level of difficulty: easy-medium
Elevation: 30m
Distance: it depends on the route chosen
Duration: it depends on the route chosen



Description:

The route suggested is part of the Nature trail GR 131. This starts from the village of La Pared and runs fairly close to the Barlovento (windward) coast. On the sandy slopes between La Pared and Pueblo del Mar, there are a small group of houses located less than a kilometer from the village. Here Burchard's Fleabane can be seen in bloom in February, and further along the trail, in a southwesterly direction, the Medusa's Head Bindweed, which blooms a little later on, can be found growing across the stony plains.

The duration of the tour depends on the individual and on the conditions of the day. You can either quickly return to La Pared by making a full circle, or continue along the coast passing through alternating sections of cliffs and small coves. It is not however advisable to swim here. There are several paths leading to the opposite coast, the Sotavento (leeward) side, from more or less the central area of the isthmus, which lead to the resort of Costa Calma.

It is important to plan your trip well and bear in mind the natural forces on route. Walking through the sandy areas in a place without shade and which is often beaten by strong winds can be tiring. If you want to go all the way to Costa Calma it is advisable to leave a car there beforehand to get you back to the starting point in La Pared.



Spiny Lettuce



Medusa`s Head Bindweed

Sea Spurge





The Mountains of Jandía

The situation and access of the Jandia peninsula takes up most of the southern part of Fuerteventura. You get there on the FV-2 road, the last part of which, going into Jandia, is dual carriageway. The most important populated area of Jandia is Morro Jable. It was a little fishing village in the 1960´s but nowadays it has grown into a town with a population of 8000.

The natural park of Jandia is 14,318ha and makes up the majority of the Jandía peninsula, excluding only the tourist area of the south-east coast. The LIC (ZEC) ES7010033 y ZEPA ES7010039 of Jandía, as well as LIC (ZEC) / ZEPA ES7010042 Playa del Matorral are included.

The torn island

The Jandia mainland is in a half moon form, with a curve going from north-east to south-east. In the centre is a mountain range. Towards the south side or leeward side, the slopes are gentle and are crossed by valleys and ravines which start from the mountain summit. On the north side or windward side the slopes are much worse. In the highest part there are vertical rock faces, inaccessible without climbing equipment; further down, these cliffs give way to slopes, which get smaller, until it reaches the narrow, flat coastal area of Cofete and Barlovento beaches.

The Pico de la Zarza or Los Ingenieros is situated in the centre of the mountain range, and at 807m it is the highest point in Fuerteventura. A short distance away towards the north-east is the Pico de Mocán which is 792m high and to the south west is the Pico de La Palma, which reaches 741m. What is the origin of the curious half-moon form of Jandia? To answer this we need to know something about the geological history and use our imagination to take us back to very remote times.

View of the mountains of Jandia from the peak of El Fraile.





The volcano area of Jandia was formed in approximately 6 million years, between 21 and 14 million years before our time. Its initial form was more or less circular, with a radius that geologists calculate to be about 12-13km. Its peak was about 2000m high, nearly 3 times what it is now. Nowadays you can see the last phases of growth from the layers of lava on the volcanic area. They are perfectly distinguishable in the highest part of the mountain range when you look from Cofete. Each horizontal layer represents a lava flow. Between the emissions from one and another there may have been a few years, or several centuries, or several millenniums.

With each overlaying layer, there is more weight on the volcanic area and it becomes so high that parts of it can crumble. It's a kind of cataclysm, which has only been known and studied recently and it is very common on volcanic island, known as gravitational sliding.

Nobody has contemplated gravitational sliding on a much larger scale, but there is a lot of evidence that this did happen in the past. Oceanographic expeditions have detected large accumulations of fragments of different sizes by sonar and dredging, and between them are blocks with pebbles, hundreds of metres in size, made up of the same volcanic material as the islands. There are hundreds of kilometres of them in the seabed.

Obviously they are witnesses to rocky avalanches coming from the islands. The existence of sliding has been confirmed in the last 20 years in a lot of places in the Canaries, Hawaii and other parts of the world. They cause huge waves or tsunamis which are able to travel an ocean. Similar events will occur in the future, for example in the young islands of La Palma, El Hierro and Tenerife, which are still growing. Fortunately there is no evidence that it may happen in an area close by to Fuerteventura.

These collapses may be small and localised or they may get to huge dimensions. In Jandia, several have originated, possibly when the volcanic area got to its highest, which was 13-14 million years ago, collapsing its entire Northwest half. The trigger could have been a volcanic eruption accompanied by strong earthquakes, which shook the unstable volcanic area. Masses of rocks fell down to the submarine flanks of this volcanic area. They destroyed everything in their way and in very little time.

The "bite" caused by the sliding of the volcanic building of Jandia was later enlarged because of marine erosion and rainwater. The last came from the valleys and ravines. It is very difficult to believe that an island with so little rainwater had been able to form ravines, but you have to take into account that there have been large periods of time when the climate was different to what we know now and there were several püeriods with more rain.



A sea of flowers of Bolle's Sea-Stock during the humid winter of 2005

More than 90% of the rocks in Jandia are made from diverse types of basalt. These are rocks which are generally dark in colour, abundant in all the volcanic regions around the world. The rest are formed by trachyte: the islet of Cofete, which is a rocky platform with little elevation, situated on the beach of Barlovento, a part of Cuchillo del Palo and the mountain of the Moriscos, very close to the plains of the Punta of Jandia.

There is a particular climate in the mountain range of Jandia, to the rest of the municipality of Pájara: because the mountains get to an altitude high enough to condense the moisture of the trade winds. Due to this wind, a sea of clouds forms regularly in summertime wrapping round the summit. This has important consequences for the vegetation. The sea of clouds often stretches some kilometres in the north-west direction, providing a high protection of insulation and high humidity in Cofete and in general the slopes of Barlovento. This phenomenon only repeats in similar forms in some parts of the Betancuria-Massif and on some mountain-peaks in the north of Fuerteventura.

The sea of clouds covers the summit in summer





La apañada

Pasture reserve in difficult years

Jandía has a lot of archaeological sites from the pre-European times, which means it was very important in the Majoreran society. Most of them were temporary settlements and others were farming structures which could be big corrals or smaller barns (for mother goats and kids) or pens (for kids). These can be found spaced around the mountains and ravines to protect the animals from ravens and other possible attackers. More rarely stone houses in ruins can be found and parts of old barns are still in use today. There are also burial sites and several places with engravings.

This intense utilisation of Jandía by the old settlers which continued after the arrival of the Europeans is why this area is wealthy in resources. In the past it offered wood, and vegetables for humans to eat and in the coastal areas there was an abundance of fish and seafood. The most important without a doubt, is the abundance of water and pastures in comparison with other parts of the island. Some archaeologists think that Jandía was an independent region of the two aboriginal kingdoms that existed in Fuerteventura in the time of the conquest, which functioned as communal grassland.

Jandía maintained this characteristic until recently. In times of drought, the other shepherds came to this part of the island with their animals, but they had to pay a certain amount for each animal that stayed in Jandía for the winter. The respective landowners established a system of leasing, in which the tenant paid rent, taking the money from the inhabitants in Jandía and those who brought their livestock from other places, to create a system of sharing. The agriculture arrived late to this part of the island, possibly after Cofete was inhabited, which was about 1800, and it was done principally in this area and in some ravines on the south-east slopes.

Nowadays raising goats is still very important. The activity has been partially modernised and it is posible to find farms equipped with milking machines, food silos and other accessories. In these installations the livestock is stabled. But many people still keep their animals in traditional farming, which hardly differs from that of the pre-Hispanic inhabitants. The people who visit Jandía for the first time and go into the country on an excursion find it strange to see lots of wild goats without goat herders. They ask how is it is possible to milk them as they are so far away from populated areas. Although it doesn't look like it

all these animals do have an owner who checks them periodically, knowing the areas where they go to drink, where they usually sleep and where they give birth.

These free living animals are called “goats of the coast”. These are descended from an old native race different to the Majoreran, and are descendents of an ancestral flock brought by the primitive aboriginal inhabitants of Fuerteventura. They are smaller with smaller heads than their island compatriots. It is an animal for meat production, not milk, which has adapted to the extreme conditions on the island. Its fur is predominantly black and white in colour. Despite being on Fuerteventura for more than 2000 years its recognition as a native breed was not achieved until 2010, (along with three other breeds - the tinerfeña, la palmera and majorera), thanks to a veterinary investigation which included its genetic make-up.

There are approximately 50 farmers on the census that exist in Jandía, which have about 15,000 livestock, 50% being goats and 50% sheep. Camels and cattle don’t exist now. The older generation remember the existence of small pigs with dark fur in the hills, which nowadays don’t exist. Only a few farmers can live exclusively on farming their flock. For most others it is only a side line.

The farmers and the Mayor choose a commissioner who is in charge of the goat-keepers of the farms and helps manage their affairs. Among the tasks of the person holding this position indefinitely is to establish a calendar of typical Majoreran goat herding (apañadas). In the „apañadas“, which are directed by the commissioner the animals are obliged to enter an enclosure called a „gambuesa“. To achieve this farmers move around in the rugged terrain using wooden sticks, called „latas“, and count on the collaboration of their dogs.

The animals are checked over by a vet and those that were born out in the country and still don’t have a marking are marked with incisions in the ears and more rarely on the nose or chin.

There are no boundaries assigned to each goat-owner, but they have the right to leave the animals in places they believe are the most appropriate. Sporadically they still bring in flocks from outside of Jandía including from other municipalities. In the years with very little rain, the majority of the flock is picked up and quite often some owners are forced to sell or kill part of their flock because they can’t afford the upkeep of the animals. In these bad years a lot of animals who have escaped from the people who go to catch them die. In this way the number of the flock is reduced, so in the dry years the numbers are naturally regulated. The goat has a much higher capacity to survive times of adverse conditions than the sheep.

Finally the flock gathers in the corral - gambuesa



A shepherd jumping with the “lata”.



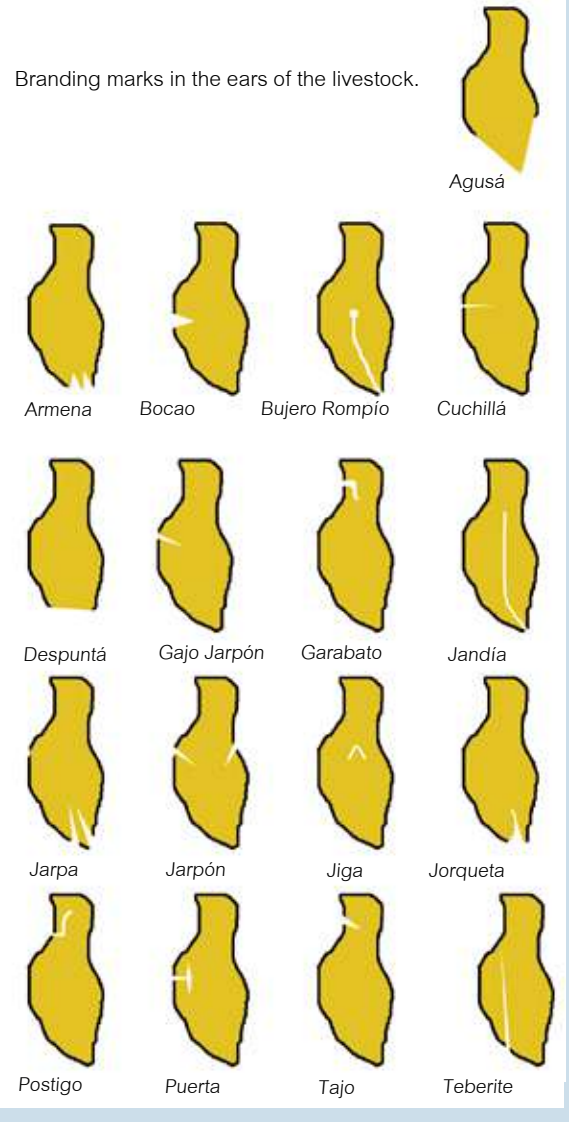
Identification markings on livestock



Personal markings of some goat herders:

Pedro Cabrera Rodríguez	*"Postigo" marking on the front and cut behind one of the ears, and in front of the other a marking like a bite mark "bocado".*
Pedro López Pérez	*"Postigo" marking on the front and a marking like a bite mark "bocado" behind one ear and in the other ear. Other special markings known as "horqueta" and "chichofe*
Juan Acosta Curbelo	*"Teberite "marking at the front and two cuts inside, the" teberite" marking in the ear and behind the other ear there are markings called " horqueta" and "garabato".*
Pedro Rodríguez	*"Teberite"marking on the front and a marking like a bite mark "bocado" inside the "teberite "marking in one ear and in the other ear markings called "armena" and" chichofe".*
Jorge Viera Díaz	*Teberite" marking on the front and the "horqueta" marking in one ear, and in front of the other ear is the "postigo" marking.*

Branding marks in the ears of the livestock.



They are called "differences" which are visible for life. Each marking is usually made up of three cuts in the ears and each owner has their own individual marking. The markings are passed from father to the eldest son, while each of the other brothers has to add a difference to their markings.

In Fuerteventura there are eighteen different identification marks in the ears and various others which can be done on the goats´ faces all with curious names like chichofe, garabato, moquillo, nariz abierta, manzanilla or barba.

It's normally clear which young animal belongs to each mother, so that there is no problem in knowing who the owner is. The animals whose owners are not known are marked by the commissioner and become common property. They may stay in the area, or be sold or auctioned off. The profits are managed by the commissioner.

The big „apañadas" are popular local parties attended by lots of people. Apart from the income, this activity of goat herder has a character of self-affirmation and defending his identity against the

process of the rapidly changing traditions due to the immense amount of tourists that are coming to the area.

The future of goat herding in Jandía must be modernized taking in account environmental, hygiene and economic factors. It is very important that this activity is compatible with the protection of flora and vegetation, by creating areas where grazing is not allowed and also deciding the amount of time that the rest of the areas can be used.

Harvest of the Lichens

Apart from the goat herding in the mountains of Jandía there is also harvesting the Staining Lichens - orchilla. Under this name in the Canaries various species of lichens from the genus *Rocella* are known. Before the arrival of synthetic colours these were used to obtain colourants, therefore being an important economic resource of the islands.

The Staining Lichens live on rocks exposed to the trade winds full of sea spray. In Jandía the conditions are ideal for its development: the mountain range rising sharply from the sea so the sea spray can reach up to the highest points.

The landowner had the exclusive rights to sell the Staining Lichen, although it could be leased. In the first part of the XVIII century the landowners of Fuerteventura leased various parts of the island to the harvesters, and amoung them large parts of Jandía, for which they had to pay 60 old Spanish coins a year. Harvesting the Staining Lichen is a dangerous job and not very profitable for those who do it. The main profits were for the landowners. According to Juan Pedro Luzardo, in his book," Origins of the land in the Jandía mainland", this activity was done by relatives who had a nomadic lifestyle in very inhuman conditions and their knowledge was passed from father to son.

The harvesting of Staining Lichen lasted until the 1950´s, above all in the Pecenescal, Esquinzo and Vinamar ravines. Nowadays this activity has completely seased.

Rocks covered with Staining Lichen and other lichens





The last remnants of a cloud forest

Jandía is the only part of Fuerteventura where you can find the four main indigenous euphorbias on the island: CAnarian Cactus-Spurge, Jandía Cactus-Spurge, Balsam Spurge an King-Juba-Spurge. Potential vegetation communities dominated by these species are scattered throughout the peninsula, almost always occupying small enclaves reminding us of a strong impact of human being and their animals had on the land. There are small sweet tabaibales scattered from the coast to the high inland areas at the head of Gran Valle, over 500m high. Bitter tabaibales occupy the gorges of the leeward side and are currently recovering. The most important groups of Canarian Cactus-Spurge remain in the area of Cofete and the revines of Vinamar. The Jandía-Spurge can only be found in three valleys of the southwest coast.

Also in the midlands are tiny remnants of thermophilic dry forest, with rather isolated individuals of mastic, wild olive, Canary Marmolán and other species, situated by a cliff and surrounded by a few species of accompanying vegetation. In the case of Marmolán, the presence of this species has declined down to only one known specimen. But the most important example of the vegetation of Jandía is at the very top. There are Peralillos Canaries, Adernos, Mocanes and other Canarian monteverde trees , the rocks are densely covered with water ,dripping moss and fern branches. Who expected this in arid Fuerteventura? You can even find brambles on the highest peak in the area.

This is possible because in the height of summer, when it is hot on the coast and in the inland plains, the fog that envelops the peaks of Jandía creates a cool, moist environment that allows the survival of a vegetation type similar to the laurel forest of the Western Canaries and Madeira. Remains of ancient communities of plants and animals exist there, descendants of those in the Miocene era, which inhabited the Mediterranean basin millions of years ago. They are unique in the eastern Canary Islands, and where they currently exist only in Jandía. There they are protected by the bleak and inaccessible rocky north-facing walls and therefor save from animals introduced by humans.

The few remnants are not spectacular for their size or visibility in the landscape. Most people climbing to the Pico de La Zarza can‘t see them, because this requires a dangerous climb on the cliff and the view may still often be blurred by the fog. The steep walls are only accessible using



Luxuriant vegetation in the rock faces near the summit

climbing equipment and are in fact a good part unexplored.

The area is important because of its scientific interest and high conservation value. It has an outstanding diversity and richness in endemic species. In an area of few square kilometers there are seven species of exclusive vascular plants: Jandía Daisy, Bolle‘s Ragwort, Jandía Viper‘sBugloss, Fuerteventura Thistle, Christ‘s Restharrow, Arnoldo‘s Fennel Stalk and a small grass recently discovered and scientifically called *Trisetum tamonanteae* (Tamonante‘s Oatgrass).

Together with them grows the Silky Golden Star, a scrub endemic to Fuerteventura that can be found in various parts of the island, and at least five other species that are also found in the Famara mountains, located about 150 kilometers away in the north of Lanzarote.

Added to these are dozens of plants endemic to the Canary Islands and Madeira and also a much higher number of introduced plants, the majority of which are herbs and plants from the Mediterranean region.

In addition Jandía is the only place in the Canary Islands where there is an exclusive moss: *Ortotrichum handiense*. It grows on the branches of the Silky Golden Star and other shrubs, and sometimes on rocks, in an area of no more than half a square kilometer. Many other species of moss and liverworts (a group of related plants) and lichens share their habitat.

Jandía-Marguerite





An example of a giant Balsam-Spurge in Toto

Succulent euphorbias

The Euphorbiaceae is a plant family with more than 5,000 species. It consists of herbaceous plants, shrubs and trees, as well as succulant species. These are plants in arid areas that store water in their tissues to withstand periods of drought. Succulent euphorbias of the Canaries can be divided into three groups. The first is formed by branched bushes. They have leavesand no spines and are called „tabaibas".

Two of the nine species that inhabit the Canary Islands are represented in Fuerteventura: the King-Juba-Spurge and the Balsam-Spurge.

The second group consists of plants which are branched plants, leafless but with spines. In the Canary Islands they are called „cardón", and there are two species, the Canary Cactus Spurge and the Jandía Spurge.

The third group consists of euphorbias with cylindrical twigs, lacking both leaves and spines. There is only one indigenous species in the Canaries: Euphorbia aphylla - a bush on the northern coasts of Tenerife, Gran Canaria and La Gomera.

All succulent euphorbias have white latex in their tissues. It contains irritants, which can be dangerous if they get in your eyes. The exception is the Balsam-Spurge, whose latex is less irritating. Another common trait is the mode of seed dispersal. The fruits are three-chambered, each chamber contains a single seed. The capsules dry throughout the summer and explode with an audible click on a hot day, throwing seeds all around.

Canary Island Cactus-Spurge in Montaña Cardón



Grasshoppers without wings and indigenous snails

The Stonechat and Blue Tit of the Eastern Canaries reach the very peak in Jandía, where in spring you can hear the song of the Canary Bird, which is rare in Fuerteventura. Also the Short Toed Lark and the Berthelot Pipit are very widespread. Ravens, Kestrels and Buzzards fly over the ravines and the Barbary falcon makes its nest on the inaccessible rock faces. Lizards are frequently found in Fuerteventura, which can also reach the highest peaks, as can the Majorero wall gecko.

Among the mammals, there is an abundance of North African hedgehogs and rabbits, but in Jandía there doesn't seem to be large populations of Kuhls Pipistrelle bats, which are present in other municipalities.

Tthere are many invertebrate species. In the areas with King-Juba Spurge and Cactus-Spurge we can find the „Cigarrón Palo Majorero". This locust is indigenous to the Eastern Canaries. If there is an enemy approaching, they do no flee, but trust in their dark brown colour to hold them still and also use twigs to hide. They jump at the last minute, but lacking wings, their jumps don't take them too far away. The locust principally eats the leaves of the King-Juba-Spurge and can grow up to a maximum of 6cms, but the females can get up to double the size of the males.

Numerous species of insects and spiders, many of them with a restricted distribution, also form part of the ecosystem of the summits of Jandía. More noteworthy without a doubt is the amount of species of land snails. Of the 20 indigenous species which have been found in Fuerteventura, 12 live in the mountains of Jandía and half of those are exclusive to the damp forests of the peak.

Obviously this relict ecosystem, an authentic "hotspot of biodiversity", is very strongly threatened. Found for centuries on the steepest cliff, it is vulnerable, above all, to long dry spells. It has a very uncertain future due to the inevitable climate change.

The biggest part of the area where it can develop is now occupied by the Silky Golden Star shrub, a type of shrub which has gone up to the cloudy areas, after the original forest was cut and herbivores were introduced. This plant was not appetising for them except when they could not find anything else.

It is of vital importance to protect the rest of the damp forests and to extend their area, to get back, in the long term, a ground cover which protects from erosion and to help conserve the water resources and the unique species that have survived on the old top of the volcanic area of Jandía.



„Canariela majorera"

„Cigarrón palo majorero"





Gongarillo majorero



Gongarillo mayor de Jandía



Bourgeau`s Thistle



Jandía Vipers-Bugloss



Jandía-Marguerite



Christ`s Restharrow



Mastic Tree



Marmolán or Canary Island Bully Tree



Canary Island Maytenus



Mocán



Bolle`s Ragwort



Tamonante`s Oatgrass



Elmleaf Blackberry



Famara-Reichardia



Macaronesian Polypody



..and Lex-Flowered-Monanthes





Communities of mosses and lichens



Sand-Snail



Chuchang-Snail



Arminda majorera



Jandía Land-Snail



Great Disdera-Spider



González' Galathus

Recommended Route: Jandía - Pico de la Zarza

Level of difficulty: Medium

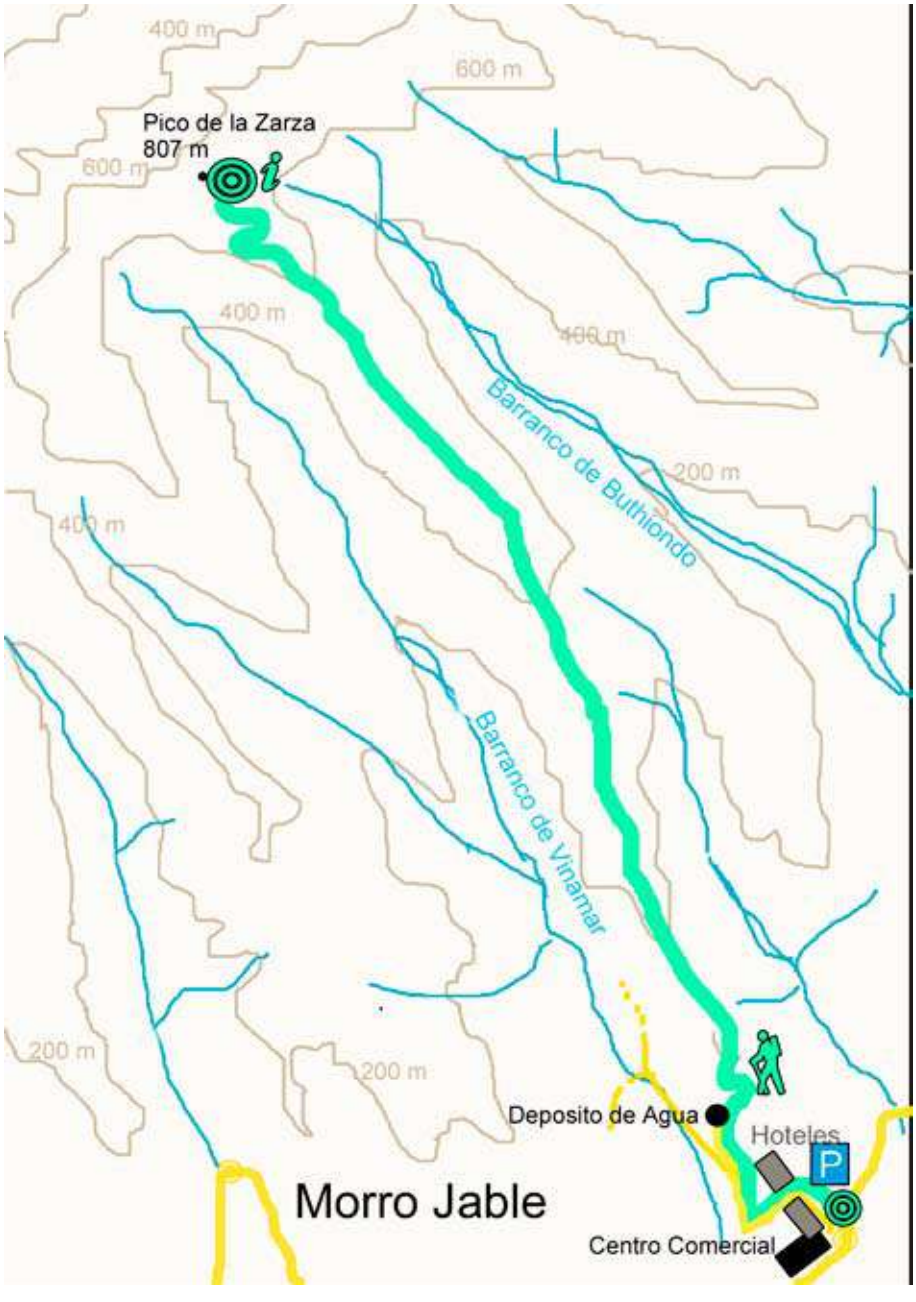
Elevation: approx. 750m

Distance: 7 km

Duration: 2.5 to 3 hours

Description:

Heading up the street Sancho Panza from the hotels and commercial area, after about 500m off to the right is a dirt track that goes up to the Pico de la Zarza. This track is part of the Nature Trail GFRP 54. Follow the track about 6 km uphill, where it becomes a winding path that leads to the top.





View from Pico de la Zarza to Gran Canaria and Tenerife



Sotavento Beach

These shores can be reached from various parts of the FV- 2, the coastal road. As of September 2011 this space was declared a Special Area of Conservation (SAC) , contained within the Natura 2000 network which aims to ensure the long term survival of the most endangered species and natural habitats in Europe, helping to prevent the loss of biodiversity caused by adverse impact.



The large sand dune close to Risco del Paso

Sand and water merge into the horizon

Something unique, which is impossible to find elsewhere in the Canary Islands, can be found by looking out to sea from the area of Los Verodes . A wide sandy platform spreads before us which is periodically lost at sea. You can walk it at low tide, but it is covered by water at high tide. Unfortunately some uninformed bathers get a great shock when within just an hour; the water begins to cover everything and forces them to swim out in an area which just a short time ago was a dry plain.

In a way it seems like the mouth of a great river, or a sandy delta. However, this river doesn't exist and has never existed because we cannot consider a dry ravine (Barranco de Pecenescal) to be a river. It barely reaches the area inside the Jandía peninsula, and the water just carries sand and perhaps some clays. The accumulation of sand in a waterlogged area which extends seaward is caused exclusively by the action of the ocean currents and wind.

Stray sandy areas appear mostly on the back of the island, on the opposite coast, the Windward coast, where the wind travels easily throughout the Jable up to Sotavento. The vegetation of the isthmus is adapted to the saline sandy invironment. The sand is always in the move due to the north-easterly wind - trade-winds - which are constant and unforgiving. However the vegetation is able to retain the sand in soft sandy mounds - microdunas mode (nebkas), always on the move due to the northeasterly winds - the trade winds – which are constant and unforgiving.



Dune with characteristic vegetation

However, the sand finally stops this incessant movement on the Windward coast, forming a wide parallel to it as a natural barrier or breakwater , which will continue to the south, moved by currents and enriching this beautiful and yet partly secluded beach. There is an uninterrupted golden stretch of sand from Costa Calma to Morro Jable which is approximately 14 km.

In the area south of the previously mentioned urbanization of Los Verodes it reaches a maximum width at low tide of about 650 meters. Between the sandy wall and the solid ground the waters are trapped in shallow temporary ponds, which are quickly covered by a refreshing sea at each high tide, full of food for a specialized fauna.

In certain areas flat sands are raised in giant longitudinal dunes, called Rayones. The name is unique to Fuerteventura, named in the language of the Majorero and derivated from the word for the old measures for cereals. So these dunes remind us of the way cereals were measured and stacked.

Currently, there are two main linear dunes which stretch into the sea southwest of the houses of Risco del Paso. In the early 1980s these were 300-400 meters long and 15 meters high, but nowadays have reduced in both height and length. Also the width of the Sotavento beach has reduced. One of the causes may be the increased vegetation that has been observed

in recent years in the isthmus. This is due to the decline of livestock in this area and to the fact that vegetation fixes the sand. However, we must not underestimate the negative effect of the buildings and the road along the whole of the coast, constructing more barriers that hinder the movement of the sand. As has been demonstrated in several scientific papers, new tourist facilities have lessened the free passage of the winds and thus the free movement of sands between Windward and Leeward. The dunes have decreased in size and scope, the coast line is reduced and the beaches are increasingly rocky, projecting the future of this unique coastal space with some pessimism.

In damp winters Bolle's Sea-Stock grow in the sand.



From the livelihood of a few to a place enjoyed by many

Until 40 years ago, the beaches of Sotavento were visited only by fishermen and shellfish fishermen. The quiet waters made it easy to fish from the land, using different methods, one of them called “embarbascar”. They also fished, and still do, in various ways from small boats near the coast.

Not unusually, the Sotavento beaches were brought to the attention of the tourist industry at the end of the 1960s. Most days the calm sea and the sunny climate make it possible to have a swim all year round, except for the days when it’s cloudy or a relatively cold winter. It is the main tourist attraction in the municipality of Pájara. Of course the urbanistic development and the intense use of the coast is also the biggest threat that hangs over this landscape. It is essential to plan projects carefully in the medium and long term to guarantee, the harmony between the landscape and wildlife and on the other, the interests of the tourist industry. Additionally all of us need to contribute to preserving this delicate balance. We should never forget that the beach is also a natural place and that we, with our animals, sun loungers and umbrellas, swimming, kitesurfing and windsurfing all have an effect on the beach itself and the wild plants. The coexistence of everything is possible, although at times it is complicated.

The Sotavento lagoon during a Surf World-Cup



Here is the world of wind surf



The first windsurfing World Cup in the South of Fuerteventura occurred in 1986 on the Sotavento beach. Immediately it made history because the Frenchman Pascal Maka secured a new speed world record in windsurf with 38.86 knots. Since then the windsurfing and kiteboarding World Cup has been organised by Rene Egli every year, during the tradewinds, counting on the help of the Pájara municipality and the Island Council of Fuerteventura. Normally it will be held from the end of July to the beginning of August . International media broadcast this event and in 2014 there were 112 million European TV viewers. This classifies the windsurfing World Cup as the most important and biggest promotion for Fuerteventura. For those who are interested in aquatic sports in Europe, either participating or watching, this event is like a powerful magnet. The event is highly thought of and the atmosphere on the beach is beyond compare during the championship, where each visitor can experience up close the prowess of the best windsurfers and kite boarders in the world. Every day in the tent, which is situated next to the area where the championship takes place, there are around 1500 spectators who enjoy this unique atmosphere, with live music, select gastronomy and a varied programme for all the family. For the lovers of nightlife up to 1500 spectators can enjoy the legendary tent into the early hours of the morning with concerts and live music.



A curious way of fishing (embarbascar)



Fishing with the help of poisonous plants is an ancestral method used in many parts of the world. It is practised in lagoons, small coves and even in pools left by the tides, in easily accessible places with tranquil shallow water.

In the Canaries, Cactus-Spurge and King-Juba-Spurge were used, as their milky sap is very poisonous. When small branches of these plants were thrown in the water, the fish were very quickly stunned and were found close by floating on the surface, where they could be picked up easily. In the salt marshes of the Sotavento coast, the method of “embarbascar” is also known as “embrosque” and was used up till some decades ago to catch mullets, harvestfish and other types of fish that came close to the coast at high tide and which stayed on the surface to be picked up later. Nowadays this type of fishing is prohibited.



The cut shows the milky sap of the King-Juba-Spurge

Recovering salt marshes

In the shore-area we find the same flowers and vegetation on the Sotavento beaches as we would in the Isthmus and Jable of La Pared. In the intertidal area all along the coastal area are saltmarshes, which have suffered very few attacks and therefore are well conserved. The peculiar flora and fauna of the saltmarshes are explained in more detail in the chapter dedicated to the emblematic saltmarsh of El Matorral.

There is a large saltmarsh which extends from north to south, from the height of the Verodes urbanisation to the south-west. While other salt marshes along this coast have stayed more or less the same, this one has, in the last 25 years, shown a notable increase in growth and expansion. From a small amount of Glaucous Glassworts and Alcali Seepweeds scattered over a wide surface, a large dense well vegetated area has developed. The causes are not really clear, but it is possible that the complete prohibition of the use of all-terrain vehicles on the beach, which has come into place in recent years, may have influenced this.

Moquin's Saltbush also exist. These collect the sand of the dunes and are only found in those places that are higher than the beach, where there is no water to wet their roots and where the sand is looser.

View to Risco del Paso



Active tourists

They are not from here or from there, the queens of the amazing sandy areas of the lee-side of Jandía. They are the travelling birds, always passing through, tireless and unstoppable.

In fact, tens of thousands of years ago, before humans started to develop tourism to escape winter, there were lots of bird species already undertaking, year after year, long journeys, which they started in Autumn, from their breeding areas in Northern and central Europe to their African Winter quarters, returning there in Spring. There are some species of birds that fly to the tropical areas of Central Africa. Others will stay around the Sahel area, due to the climate change and the increase in the temperatures. There are even some birds which find conditions are getting better near their places of origin, therefor opting to winter in the Mediterranean region and North Africa.

The Canaries are not the main route for the migration, but every spring and autumn they receive an unexpected amount of different species of birds, coming from the neighbouring African coast. During the days when there is wind coming from the east, the birds are dragged to the islands, where they stay for some days until they are able to begin their journey again. In these times it is easy to see flocks of swallows, swifts, chiffchaffs, garden warblers and other different types of birds, mainly insectivores. Normally they are found in parks and garden areas, where they can find shelter and food, but they can also be found in all areas of the island. The ornithologists go to the countryside with their binoculars looking for anything rare or unusual. The cats hunt and catch some individuals which arrive exhausted after their long journey over the sea.

A pair of Sanderlings





A Yellow Legged Gull resting on Sotavento beach

There are birds which regularly winter each year in Fuerteventura. The more frequent ones are robins and song thrushes, together with Black Redstart and other. But without a doubt the greatest numbers of winter visitors are the waders and the long beach of Sotavento is one of the best places to see them.

They are birds that are linked to wet areas and they feed on small invertebrates, crustaceans and molluscs thanks to their beaks which have evolved in size and form. It is only on this beach that you can see flocks of common ringed plovers, dunlins, curlew sandpipers, red knots, sanderlings, whimbrels and grey plovers. On the other hand it's more important to look after the threatened Kentish plovers, which have the biggest breeding colony on the beaches of the Canaries, where there are more than 300 individuals accounted for.

The abundance of fish in these tranquil waters is an attractive magnet for large groups of Sandwich Terns, at times there can be up to 1000. They are also joined by Common Terns, Roseate Terns and Arctic Terns Albeit less frequently. When they come calling to our shores these Arctic Terns are very weary. They briefly rest from an extraordinary journey across the world.

One of the longest journeys a bird may fly each year from the North Pole to the South Pole, up to 80,000kms. Also coming to fish in the pools are herons and egrets, accompanied by the Eurasian Spoonbill, whose amazing beak is a very efficient tool to sieve through the clay looking for food. The Eurasian Spoonbill often have multi-coloured rings on their legs, identification rings placed there by scientists to follow their movements and prove their origin (Holland or Andalucia) on their way to their winter places like Banc d´Arguin in Mauritania, the station Mecca for millions of European migrating birds.



Sanderlings always looking for something to eat.

This huge beach also is a refuge to all sorts of seagulls. There are mainly Yellow Legged Gulls and lesser Black Backed Gulls, but sometimes more rare ones like the Black Headed Gull, the Slender Billed Gull and Audouins Gull and also the Polar Seagulls from Greenland or the Glaucous Gull, authentic national rarities.

Finally in the search for the abundant silver fish of the shallow waters, you can see, especially in winter the spectacular silhouette of the osprey. Although the species breed in the Canaries, it has been nearly a century since they bred in Fuerteventura. The ones we see here are basically European Ospreys, mainly coming from Scandinavia and the United Kingdom and come here for the cold months or spend a few days resting on their journey to their winter home in tropical Africa. The Canarian name for this osprey is “guincho”, which comes from Portuguese. In reality it comes from the sound of the territorial meow that it makes.

All these beautiful birds bring thousands of European bird watchers yearly, eager to see so many birds and also rare species in a spectacular landscape. Bird watching tourism is an interesting exploitation of natural resources, extremely respectful of the environment, which, if allowed to deteriorate, will result in lesser numbers or even the disappearance of certain species.

For this reason the preservation of the tranquillity of the beaches, keeping all disturbances, aggression, quad bikes, loose dogs etc. away is not only for environmental reasons, but also for economic ones.



Sanderling



Yellow-Legged Gull



Ruddy Turnstone



Kentish Plover



Osprey



Bar-Tailed Godwit



European Searocket



detail



Sea Purslane



detail



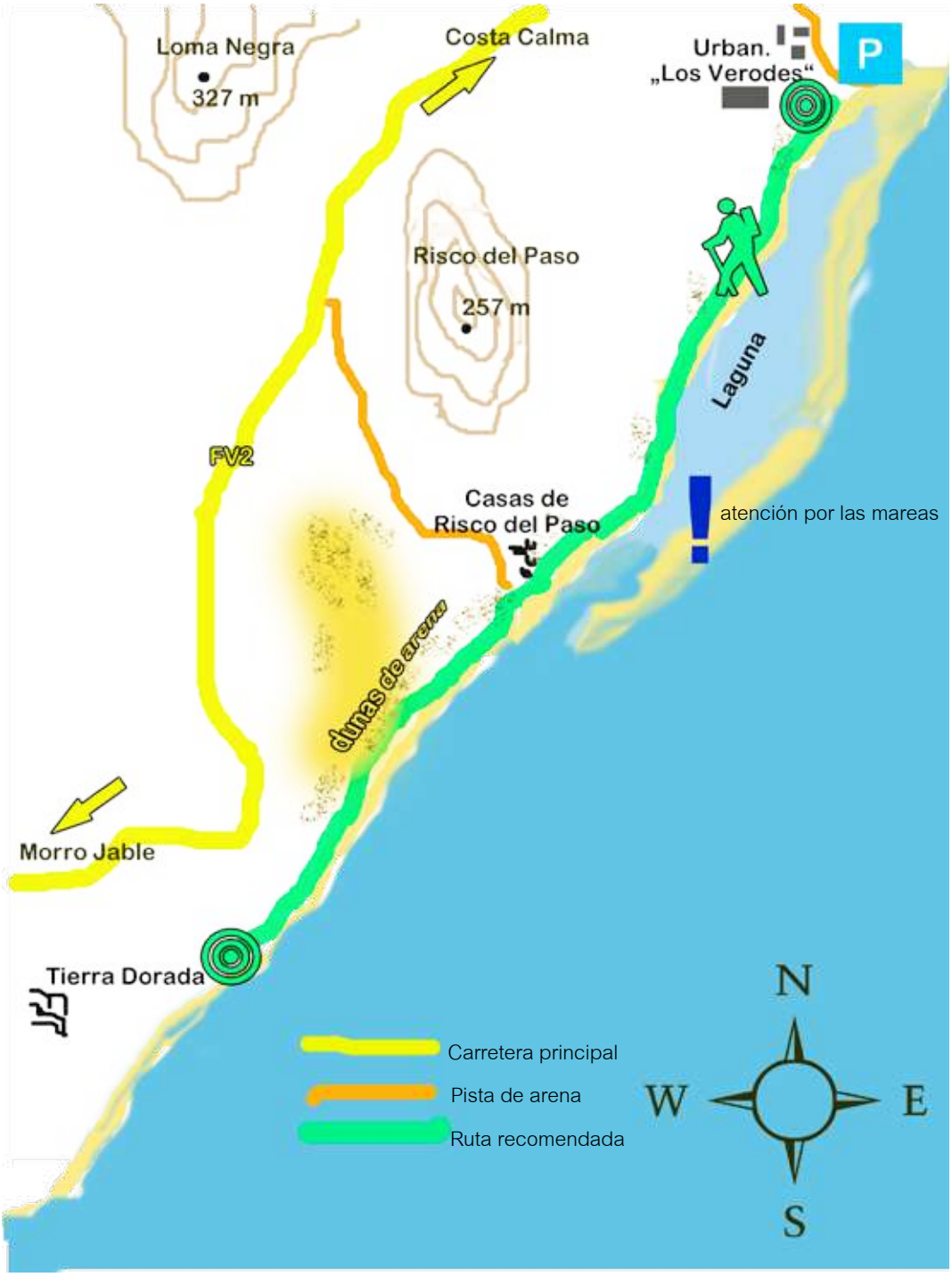
Moquin`s Saltbush



Boxthorn

Recommended route: Playa de Sotavento

Level of difficulty: Easy
Elevation: 5 m
Distance: 1,4 km to Risco del Paso and 3 km to Tierra Dorada
Duration: 1 hour to Risco del Paso and 2 hours to Tierra Dorada



Description:



This route always runs close to the sea, partly on dirt tracks and starts in the urbanization of Los Verodes, which is reached by a small road, just off of the FV2. The first part of the route runs through the broad platform of sand that juts out into the sea and is covered by water at high tide.

This is the best area to watch wading birds. In the area of this flat platform that is furthest from the sea, vast salt marshes have developed. Southwest of Risco del Paso are two very small dunes, among which areas of salt marsh are interspersed.

There is easy access back to the FV-2 road from both Risco del Paso and Tierra Dorada.





The Salt Marsh of El Matorral at the end of a winter's day.

The salt marsh of El Matorral

At the extreme southern tip of Fuerteventura, behind one of the largest and most beautiful beaches in the Canary Islands, extends a large piece of land covered with a dense carpet of dark green vegetation. The salt marsh of El Matorral, the largest in the Canary Islands, is nowadays protected as a Site of Scientific Interest. It covers 115.6 hectares, and occupies a coastline of more than 2 km long with a maximum width of about 500m.

To get to the salt marsh from anywhere in the centre or north of Fuerteventura, you have to take the FV-2 (Puerto del Rosario - Morro Jable) for approx. 86 Km . Close to Morro Jable, this road meets and runs alongside the salt marsh. It has parking on both sides making it a good starting point to visit the salt marsh.

Flooding during high tide



Living with water up to the neck

Is it land, or part of the sea? In fact, the salt marsh is an ecosystem between both: it develops in the area where these two elements are in an eternal struggle of toing and froing. While there are salt marshes inland in other parts of the world, in the Canary Islands, where they are present mostly in Fuerteventura and Lanzarote, all are coastal salt marshes. A broad area of land behind the beach, which one day can be dry and easily accessible given, but then one week later it can be completely underwater. It is the influence of the phases of the moon that determines the height of the tides. The salt marsh is flooded during the highest tides in the days around a full or new moon, and especially during those which occur in the spring and autumn equinoxes. The famous „Pino tides“ happen in September and are known across all the Canary Islands for the height and great strength of the waves, especially if they coincide with windy days.

The creatures that inhabit this ecosystem are especially adapted to its particular conditions, especially the plants. A fig tree and a lettuce for example are two plants that cannot live with seawater. The saltmarsh plants on the other hand need it.



Herbaceous Seepweed

Saved at the last minute

While the salt marshes on the eastern coast of Jandía are almost unchanged, the salt marsh of El Matorral has suffered heavy alterations and impacts. The earlier protection is a great success in environmental management.

In the 1940s small salt-works were built with the objective of providing salt for a salted fish company that had been established in Morro Jable. They only worked for a few years but were recently restored in order to safeguard an ethnographic - historical heritage, even though they are no longer used for production.

The biggest impacts took place during the growth of tourism. The construction of the first hotel on the west side of the salt marsh, in 1968, began to take away land from the ecosystem. At the same time, a dike of sand and pebbles was built in its southern part, which ran hundreds of meters parallel to the coast, on the border between the beach and salt marsh, preventing the entry of water from the sea. In the land-use planning of Pájara in 1983, 60% of the salt marsh of El Matorral was approved for building. Attacks such as the opening of new roads, gullies used to bury pipes, the dumping of debris, construction of sewage plants and waste water discharge took their toll. In the early 1990s a lighthouse was built in the central part of the salt marsh. From the very start the north side was the area least affected by these processes.

With the enforcement of the Law of Natural Spaces of the Canaries, the salt marsh was declared a Site of Scientific Interest and the Council of Pájara became owner of it.

The coexistence of tourism and Nature - the protected area of salt marsh



THE PROJECT FOR PHYSICAL AND ECOLOGICAL RECOVERY OF THE SALT MARSH OF EL MATORRAL

The protection of the salt marsh took place in 1999-2000 with the drafting and implementation of the „Project for Physical and Ecological Recovery of the salt marsh of El Matorral“ co-financed with European LIFE funds. Included in this project, the dike in the southern part of the salt marsh was removed along with other debris, water discharges were monitored and the ecosystem was surrounded by a wooden fence.





The passage from the hotels and resort to the beach was facilitated by wooden walkways that cross the salt marsh. At present, even though not all actions of the LIFE project have been completed, the vegetation is in a clear process of recovery.

The old salt-works in the middle of the salt marsh is no longer in working order.





Alkali Seepweed

Glaucous Glasswort



Seepweeds and glassworts

At first glance, the salt marsh vegetation seems very uniform. A dark green blanket of shrubs that barely exceed half a meter in height, interrupted in parts by small sand dunes. This density of vegetation is somewhat unusual in the normally arid Fuerteventura landscape, and it lets us know that this is a very peculiar ecosystem.

If you look, you can see that in most areas there are two kinds of shrubs, although in varying proportions: The Glaucous Glasswort, called the ´Salado´ in Fuerteventura, and the Alkali Seepweed. There are others, but they are quite scarce.

The Salado dominates areas with greater circulation of seawater, which are closer to the shoreline. It can reach over a meter tall and has articulate sprouts. Its greyish green colour hardly changes throughout the year. Tiny flowers appear in its joints during the summer. The leaves are reduced to very small scales that can only be seen with a magnifying glass. Their adaptation to the salt marshes is extreme and they aren´t found in any other ecosystem.

The common Alkali Seepweed however is not exclusive to the salt marshes as it also grows in humid ravines within the island, often in the company of Canary Island Tamarisk. They are usually less than a meter tall and have small alternating cylindrical dark green leaves. In summer they can acquire a bright purple colour, which is due to substances called Betalains and their formation under conditions of relative drought and shortage of nutrients. In the salt marshes, the Alkali Seepweed is usually more common in the areas nearest to dry land. In these areas they are reached by less water during high tide, but the soil is almost always wet and also contains abundant nutrients from the silt and clay that is deposited there.

In the sand dunes that break up the uniformity of the flat surface of the salt marsh in its northern part, is a plant community characterized by Moquin‘s Saltbush. This community is better developed in other areas of Fuerteventura, mainly in the dunes of Corralejo and in the municipality of Pájara on the beach of Cofete. They only occupy a small area in the salt marsh of El Matorral due to the low height of the dunes on which they grow

and coexist with the other main species of salt marsh.

In the central part of the salt marsh there are areas where the original vegetation was eliminated years ago for various reasons and which has never been recovered by perennial vegetation. However, a plant community formed by the Herbaceous Seepweed, a small annual shrub which dries up in winter, develops in this area during summer. It is possible that in time these areas of salt marsh will once again be re-colonized by these plant communities.

Quite often found in the salt marshes is the Desfontaine‘s Seagrape. This bush with its succulent, rounded leaves is also found throughout the coastal perimeter of Fuerteventura, on all types of soil. Being a halophilous plant (a lover of saline conditions) it´s never found far from the shore. More seldom is the Mediterranean Saltbush, which is also a strictly coastal species and can be found in the northern part of the salt marsh.

Apart from the four species already mentioned, several other species can be found in the salt marsh of El Matorral which are widely distributed across the municipality and the island in general. The Saltwort appears here and there, highlighted by its ashen grey fragile branches.

In some parts close to the beach there are extensions of several square meters of sea-purslane, a creeping herbaceous plant that densely covers the gaps between the ´Salados´. There are also some individuals of Shrubby Sea-Lavender, which has bright violet inflorescences in spring. The last two species are frequently cultivated as ornamental plants and many seeds have reached the salt marsh from the gardens of nearby hotels. They can´t be ruled out as native species, as even though they are both be found in the neighboring coasts of the Western Sahara and Mauritania as well, the seeds of most of these coastal species are adapted to being transported by the sea water. A small annual plant, mainly distributed across North Africa, is *Gymnocarpos sclerocephalus*. Its common name is unknown and it is only found in a few places across the Canaries.

In the outlying, degraded areas of the salt marsh alongside the Mediterranean Saltwort, the Spiny Lettuce and Soft Seepweed, other common species grow many of which can also be found almost anywhere across the municipality.

Flower of the Shrubby Sea-Lavender





Common Reed

Garden escapees

Protected from the dangers of urbanization, the salt marsh is still under threat from invasive alien species that may alter the composition and operation of its ecosystem. This mainly affects the peripheral parts, those with more degraded and sparse vegetation, where the sporadic presence of plants from nearby gardens has been detected. Blue Leaved Wattle, Perennial Subshrub, Australian Beefwood (known as the „maritime pine“ in Fuerteventura) and individuals of the Wild Tantán along with some different palm species have been found. The grass „Kikuyu“ which has been planted in the green areas surrounding the salt marsh has a remarkable invasive potential, and is capable of entering areas and completely covering the native shrubs. Near the western edge of the salt marsh there is also a population of reed, a cosmopolitan grass that easily colonizes in damp places. It´s only in areas where the vegetation is well-preserved, that it's difficult for new species to establish themselves.

The grass `kikuyo` invades parts of the salt marsh



Feathered foreigners

There are very few animal species that can live more or less permanently in this ecosystem, meaning that there are many more that choose to visit it regularly.

Among the birds, the small Spectacled Warbler is easily spotted by its constant restless movement. Occasionally taking flight, somewhat erratically and at a low altitude, to rest again in another bush just 20 meters away. It is an insectivorous bird common in many parts of Fuerteventura and shows little fear of people. It allows us to approach 5-6 meters, relying on its ability to rapidly disappear among the tangled vegetation if necessary. In winter, to mark their territory, the males sing a monotonous song from a nearby resting post or while in flight. Their nests are well hidden under the bushes.

In the peripheral parts of the salt marsh or in specific places the Berthelot's Pipit and the Trumpeter Finch are frequently found. The first is here all year. It eats insects, grains and vegetable sprouts, and has learned to take advantage of human presence to find food. It can even be seen on the promenade that runs alongside the salt marsh and in restaurants near the beach, always attentive and looking for crumbs.

This unconspicuous greyish bird is commonly confused with a sparrow. Apart from its difference in size (Berthelot's Pipit is smaller and slimmer than a sparrow) and the shape of its peak, it can be immediately identified as a Berthelot's Pipit because it runs across the ground, unlike the sparrow does little jumps. Berthelot's Pipit has its nest on the ground, protected next to a stone or under a bush.

The Trumpeter Finch is sporadically seen. It cannot be ruled out that some couples breed in the outlying areas of the salt marsh; however, they need rocky areas or an old wall to build their nests. In summer and autumn, the youngsters of the year gather in small flocks, along the beach and salt marsh in search of food. They like the seeds of the European Seerocket.

The Great Grey Shrike, Kestrel, Common Raven, Yellow-Legged Gull, Spanish Sparrow and the Linnet can also be seen. Species of several exotic birds, which have escaped from various hotels, have been added to this short list of native birds to Fuerteventura in the last 15 years.

The Sacred Ibis, white with a black neck, head, legs and tips of its wings, lives in the marshy areas of Africa and the Middle East. They can be spotted in small flocks of 6-8 birds flying over the coast or perching somewhere, looking for food in the salt marsh or in rocky areas further north. The Hadada Ibis is a similar species. It is completely dark in colour and gets its name from its powerful call emitted in flight which sounds like a trumpet.

Finally, the flocks of Monk Parakeet with up to several tens of individuals and formed mainly by the Monk Parakeet. They make large nests in palm trees and feed on dates. They also look for

Trumpeter Finch





The Holy Ibis is nesting in the palm trees near the avenida

food on the spacious lawns of the main street and sometimes venture into the salt marsh.

Among the reptiles which are represented in the outlying areas of salt marsh are the Fuerteventura Lizard and the „Perenquén Majorero". Also worth a mention is the Leatherback Turtle, which in the summer of 1991, nested on the beach opposite the salt marsh. It is possible that this species and the Loggerhead Turtle regularly nested on several beaches in Fuerteventura in the past.

All mammals found in the salt marsh and its environment have been introduced there. The feral donkeys that live in various parts of Jandía do go into the salt marsh in search of food. Early morning or late afternoon it's easy to see rabbits in small sandy clearings near the promenade, where they behave quite tamely as they are more than used to the passing by of people.

A group of Monk Parakeets







Mediterranean Saltbush



Halfmoon Saltbush



Moquin`s Saltbush



Shrubby Sea-Lavender



Soft Seepweed



Herbaceous Seepweed



Ifni-Seepweed



Oed Massa Ragwort



Purslane-Leaved Aizoon



Bladder-Dock



Glaucous Glasswort



Sclerocephalus arabicus



Wild Tantan



Sea Purslane



Barred Warbler - a migrant



Berthelot`s Pipit



Great Grey Shrike



Spanish Sparrow



Kestrel



Horned Mantis

Recommended Route - The Salt Marsh of Matorral

Level of difficulty: low
Elevation: 3 m
Distance: 2 km
Duration: 2 hours



Description:

It is important to note that for conservation reasons we cannot march directly into the salt marsh, besides which, it is something that is very difficult to do due to the dense vegetation and the waterlogged silty soil.

However, there are several ways to appreciate this area. On the one hand, we can follow the path and complete the full route which is referred to in the title. The route starts at the most northeastern tip of the salt marsh, where we can park the car on the road. From here head north and then go around the salt marsh along the beach, always walking alongside the wooden fence marking the protected area.



On arrival at the hotels, on the furthest western edge of the salt marsh, we can walk to the street and down the pedestrian promenade back to the point of departure. Along the way we will have passed close enough to see most of the plants and their characteristics. Of course, the route can also be done in reverse.

Those who do not have the time or the desire to do the whole route can get a good overview of the salt marsh from the wooden walkway that provides access to the beach crossing the salt marsh from the promenade near the lighthouse.





Panoramic view of the Punta de Jandía

Punta de Jandía

The tip of Jandía is the most south west point of Fuerteventura. You get there by a track that starts above the new port in Morro Jable. A small stretch, to the cemetery, has been tarmacked. The track divides further south into one track which goes towards Cofete and the other continues left towards the tip of Jandía, which takes about an hour to reach from Morro Jable. All of the south western areas of Jandía form part of Jandía's Natural Park.



A place at the end of the world

The track from Morro Jable to the tip of Jandía and Cofete takes you through one of the most arid and desolate landscapes in the Canaries. It crosses a wide coastal plain which, itself, is crossed by small ravines. The north is bordered by the Jandía Mountains, which in this place appear to be even more arid and infertile than in the central and the Eastern parts. The coast is on the southward side with sections of cliffs and sandy beaches on the lower levels which are always relatively quiet, as there are no huge crowds of tourists.

This pattern is repeated from the Punta de Jandía to Punta Pesebre. Between these points there is a succession of steep cliffs, interspersed with small sandy coves, like Ojos Beach. From the shore there are volcanic dykes made of black basaltic rocks, which enter the sea in straight lines, like long walls. At low tide, just a few hundred metres from the shore, you can see reefs above the tide line. Inland there is a vast sandy plain. The plain of El Cotillo or La Angostura gently rises up to the highest point of this most western part of Fuerteventura, the Talahijas Mountain. At 189m it's an excellent vantage point to view the whole area. There is only one populated place in this remote area, el Puerto or Puertito de la Cruz, which started as a small fishing village at the beginning of the 20th century. It currently has a very small but stable population and is mainly a summer resort for many families from Morro Jable and other parts of the island. Surfers also like to take advantage of the great waves in the area known as La Turbia. It is located on the north-west coast in front of Puertito de la Cruz, but requires skill and experience due to the rough seas and thereefs.



The lighthouse at Punta de Jandía

Navigational signals

The sea beds around the extreme south-western area of Jandía have reefs that violently break the waves that have travelled across the ocean. The reefs are called Baja del Trabajo, Baja del Tigre and El Bajon and there is an extremely strong current. The sailors of Puertito de la Cruz and Morro Jable know these reefs well. Baja del Griego was especially feared in the past and is found a short distance off the tip of Jandía.

Fuerteventura has suffered drought several times which has caused severe famine on the island. One of these times occurred between 1683 and 1684, when a lot of the population had to emigrate because of the lack of rain. This left the island with only 150 families out of the 600 that lived here. Part of the population was transferred to Gran Canaria by a boat, captained by Nicolás Francisco, "the Greek". In 1684, 160 Majorerans were forced to return to their land, because they were unable to feed themselves. They made the journey in "the Greek's" boat which in a twist of fate ran aground on the reef, and since then it has been called Baja del Griego. The boat sank just a few hundred metres off the coast and only 20 of its travellers were saved.

It was therefore necessary to warn boats of

these dangerous waters. In 1864 the lighthouse on the Punta de Jandía was constructed. Nowadays it is fully automated and is home to one of the museums in Fuerteventura. Without doubt the reefs are still claiming victims. Other boats have run aground in nearly the same place as “The Greek”, like the sailboat “Ballester” which sank on 22nd August 1909. It was carrying a shipment of scrap iron and marble from Tenerife to Mallorca. Its route took them round the coasts of Fuerteventura and Lanzarote.

The wreck is resting at a depth of nearly 50 metres and is occasionally visited by sport divers.

In more recent times, to the north in Punta Pesebre, an automatic beacon has been installed. It emits light signals which cover this dangerous area, even though nowadays radar navigation and GPS have considerably reduced the risk of accidents

The beacon in Punta Pesebre



Sea grapes and sand violets

In the sandy areas at the tip of Jandía, there are Spiny Lettuce, plants called the Tenflowered Coast-Bush and the Mediterranean Saltwort and also the Moorish Sea Grape, which is a small bush with round fleshy leaves, which are greyish purple in colour. The sea grape plants are well adapted for desert areas with salty conditions. There are several species in North Africa, of which two or three can be found in the Canaries. The common sea grape is the most widespread. It can be found on the coastal perimeter of Fuerteventura, in rocky and sandy areas.

The sea grapes are all very similar in appearance but the differences can be found in the fruits. The fruits of the common sea grape are barrel shaped, but the Moorish sea grapes are elongated with a flared tip. This type is principally found in the desert regions of north-west Africa, and in the most southern area of Fuerteventura there is the only natural population in the Canaries. It's distribution area extends around Puerto de la Cruz, surrounding Punta de Jandía and finishing at Punta de Barlovento. Also, in recent years this type has been found in other coastal areas of Fuerteventura, but these could have come from seeds brought over with the sand, imported from the Sahara for construction.

The sandy clay esplanades surrounding the lighthouse at the Punta of Jandía are also home to another type of North African plant found here in the Canaries, called the Theurkauff's Ice-Plants. During rainy years it grows in shallow depressions in the land where rainwater collects. This helps with the plant's germination and first developments. Once the plant has grown, it does not need any more water, and sometimes

Common Sea Grape



produces small white flowers until late May and subsequently dries up.

Most important plant is the Bolle‘s Sea-Stock. It has striking purple flowers. Because of the colour of the flowers this small annual plant is known as “violet” by the inhabitants of Morro Jable and Puertito de la Cruz, although botanically speaking it has nothing to do with these plants. In reality, it is not limited to the Punta of Jandía; it also grows on the hillsides on the south coast of Jandía in the vicinity of the Los Canarios, Mal Nombre and Pecenescal ravines and also in the western regions of Jorós, Escobones valley and Los Mosquitos valley along with the Jandía-Spurge. It lives in other parts of Fuerteventura as well as parts of Lanzarote.

The individuals at Punta de Jandía are generally more stunted and lower growing, with fleshy leaves and big pale flowers, while those that develop in the ravines and hillsides in the other regions of Jandía, are spikier, with thin leaves and flowers with narrow dark petals. Botanists have more recently separated the varieties into different sub-species.

Similar to other annual desert plants, the development of the Bolle‘s Sea-Stock depends entirely on rainfall. In a good year, when there is more than 100 or 150 l/m^2 of rain, you will find a dense tapestry of hundreds of thousands of individuals, staining the hillside and sandy plains purple. This very striking phenomenon in the landscape only occurs sporadically, for example in the winter of 2004/2005, often having to wait a lot years to repeat the same conditions. Without doubt, even in the dry years, it is nearly always possible to find some examples of the violet.

Bolle‘s Sea-Stock in the sand at the tip of Jandía



Farewell to the Oystercatcher

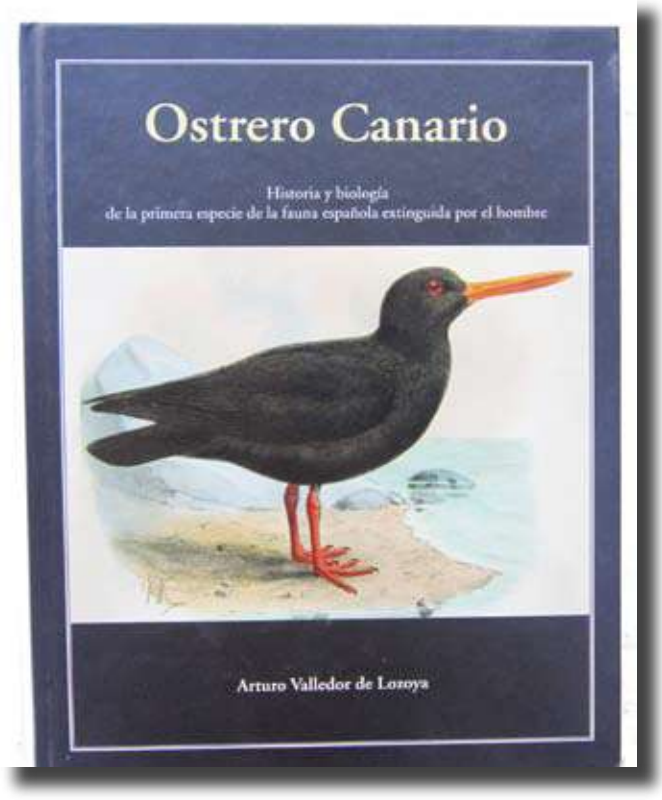
At the south-western end of Fuerteventura flocks of Trumpeter Bullfinches fly over the plains. The pipits approach the esplanades surrounding Puertito de la Cruz and the lighthouse, on the lookout for any crumbs that may have fallen from a tourist's sandwich. Also inhabiting these plains are Black-Bellied Sandgrouse, Stone Curlew, Cream-Colored Coursor and the Houbara Bustard. Atlantic Lizards leave their trails in the sand and at night Canarian Geckos come out to hunt insects. The Barbary Ground Squirrel and the North-African Hedgehog can also be found, but they are rarer here than in other parts of Fuerteventura.

In the past, you could easily observe the Canary Island's Oystercatcher, called the Sea-Raven in Fuerteventura, in the area which extends along the Barlovento coast between the lighthouse of Jandía and Punta Pesebre. This coastal bird is completely black with a red beak and was endemic to the Eastern Canaries.

Recent investigations show that it was closely related to the common European Oystercatcher, whose feathers are black and white rather than the South African black oystercatcher, with which it was originally identified. It fed mainly on limpets, mussels and other molluscs and they bred on the ground, although no scientist ever found a nest. Naturalists of the 19th Century said they were rare. Less than 10 bodies and only 1 egg from this species can be found in museums. Between the first one found by naturalists and the last detected by scientists in 1913 in La Graciosa, little more than 50 years had passed.

It could be that the Canary Island's oystercatcher survived in Alegranza for a few decades more. Its disappearance is a sad example of lots of species that become extinct due to human action. The scientists in those times were busy trying to get samples for museums instead of promoting methods of conservation. They contributed to the extinction of a species which was already rare due to the intensive use of the coastline by people taking the shellfish resulting in shortages of food for the Oystercatcher and disturbance to their breeding ground.

in his book about the Canary Island's oyster catcher, Arturo Valedor de Lozoya tells the "History and biology of the first species of fauna to become extinct because of man"





Osprey with prey in its claws

Guincho or the Osprey breeds in some of the coves in the extreme south of Jandía. They feed exclusively on fish that swim near the surface, picking them from the water with their legs extended forwards. They make their nests in the coastal cliffs and continue to add more sticks and branches every year making these nests easily visible from some distance away.

The ospreys stopped breeding in Fuerteventura at the beginning of the 1980's mainly due to the disturbance caused by humans and boats close to their nests. But every now and again you can see one, mostly on the west coast of Jandía.

Throughout the year you can see different species of shore birds on the beaches and the rocky areas. Spoonbills, Kentish Plovers, Turnstones, and Curlews and many more live in the area looking for food and tranquillity.

Eurasian Spoonbills and Common Egrets



Traces of past climate change

In several places along the coast of the northwestern tip of Jandía, signs of ancient sea levels can be seen, indicators of climatic phases which gave rise to higher sea levels than those of today. One of the most significant is that of the Corralito, located on the sea cliff about halfway between Puerto de la Cruz and Punta Pesebre.

This natural sea level indicator, which is 1m thick and visible for more than 250m, dates back to the late Miocene and early Pliocene periods. It consists mainly of rounded pabbles and basalt stones with angular edges. It is located on top of a layer of limestone, about 30-40 cm thick, which in turn sits directly on top of volcanic rock. Above this there is a layer of calcareous crust.

This site contains abundant remains of molluscs that inhabited the warm sea about 6 million years ago. While most of them became extinct in the Canaries, some of them returned during later warm periods with new sea levels later on.

The *strombus*, a genus of sea snail which today is still found in the Gulf of Guinea and Equatorial Africa, is one of these. Their remains can be found at other sea levels, mainly distributed in the southeast coast of Fuerteventura between Matas Blancas and Gran Tarajal, but are also present in the area of Punta de Jandía. They correspond to the time known as ´Jandiense´, dating back about 100,000 to 110,000 years before our era.

Area of El Corralito





Capricious geological formations



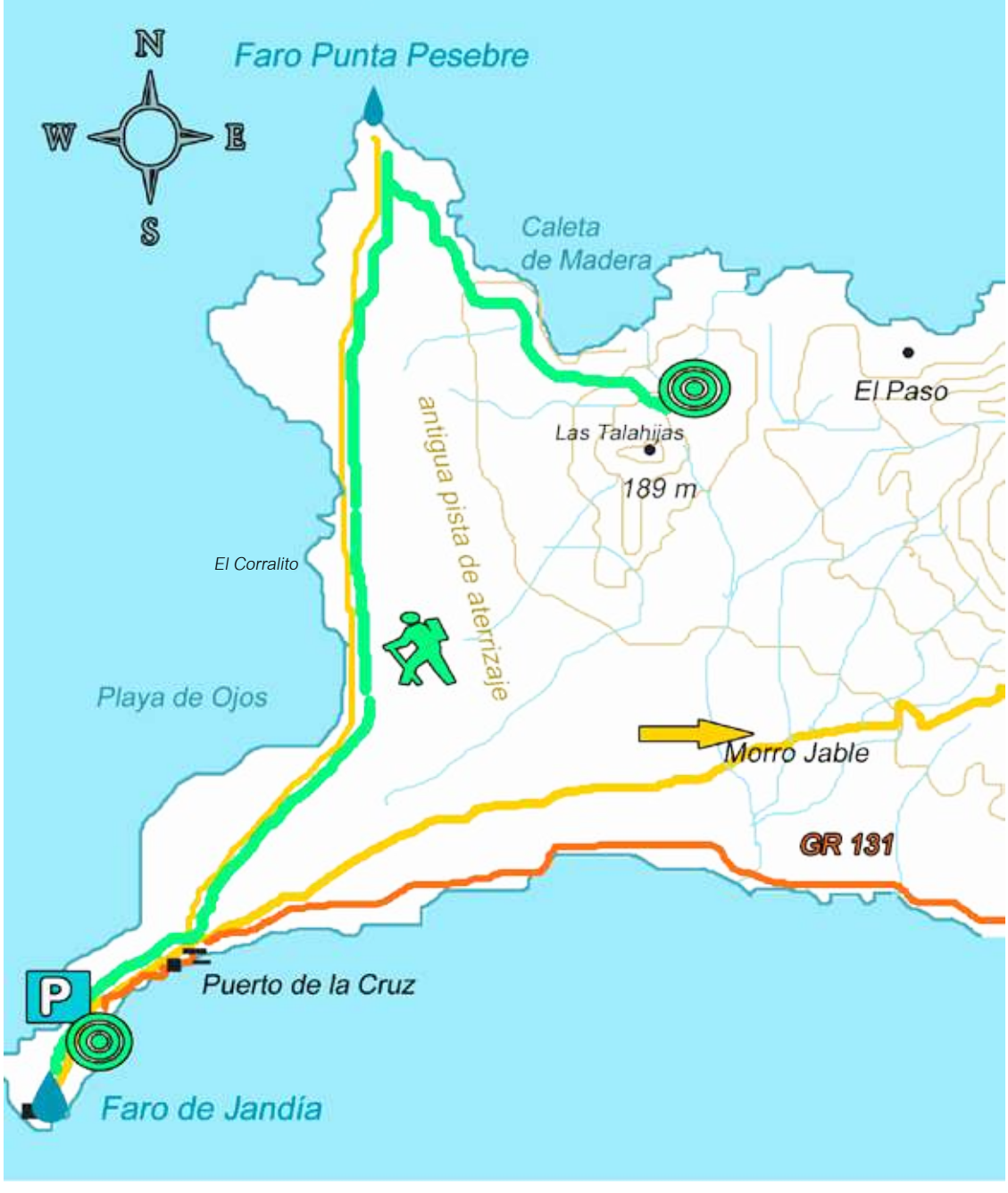
Recommended route:
Faro de Jandía - Caleta de Madera

Level of difficulty: medium

Elevation: 10 m

Distance: 6 km

Duration: 4-4.5 hours



Description:

There are many ways to experience nature on the western coast of Fuerteventura. Following the proposed route in full can be somewhat tiring, because it is an area with no shade and often whipped by the wind, but it also gives us the most complete picture of the area. We start at the Jandía lighthouse or Puertito de la Cruz, and head north sticking to the coast.

From the cliff you have a magnificent panoramic view of the rugged coastline and in some places small paths lead down to some hidden beaches. Remember that these narrow and steep paths don´t have railings or other security, and also that bathing on the beaches should be done with caution. Inland there is a vast sandy plain with low-lying vegetation.

There is an old runway, completely free from vegetation, that runs alongside the track at about the height of the Punta del Corralito. On arrival at the Punta Pesebre, the view expands across the entire secluded beach of Cofete. Continuing along the coast, now heading east, you finally arrive at Caleta de la Madera.

It is also possible to go by car - preferably an off-road vehicle - following the track that leads to Punta Pesebre. You can stop at various places along the track to sightsee or head down to one of the beaches. Further east of the Punta Pesebre cars are prohibited and it is not permitted anywhere to leave the marked tracks.



Caleta de la Madera



Coast Ragwort

Tenflowered-Coastbush gnawn by the goats



... and an individual bush in damp winters





Cofete

You can reach Cofete by car or by a small bus on a track near the harbour of Morro Jable. This track also leads to the Punta de Jandía. An alternative is to walk the marked route from the Gran Valle, along the slopes of Sotavento. The area of Cofete is located entirely in the Natural Park of Jandía.



The wildest beach

When you arrive at the path to Agua Oveja, an impressive panorama opens up before you. The mountain range stretches in a broad arc towards the isthmus of La Pared. The mountain tops are shrouded in fog and their feet buried in a huge beach. The great breaking waves coming from far away in the Atlantic produce a foam, and millions of tiny droplets of water become suspended in the air as clouds and move inland.

A brave and impetuous sea, this has no resemblance to the calm, clear waters of the Sotavento coast where the tourist resorts are found.

Swimming from the beach of Cofete is dangerous due to the dragging force of the water. It is only suitable for bathing during a few calm days of autumn, when the trade winds have decreased their activity. That said, caution should still be taken and it's important to not go out of your depth.

Perhaps for this reason and because of its relative remoteness, the area of Cofete has escaped from being built up, unlike the opposite coast. Currently its membership in the Natural Park of Jandía is the guarantee that this area will be preserved - hopefully for many years – and in its original state.

In Cofete you can get a good view of the internal structure of the volcanic massif of Jandía. The highest part of the original structure was probably found in what are now shallow waters off the coast of Cofete. The gravitational landslide that wiped out its entire northwestern half caused a split in the structure, revealing ancient volcanic cones buried under successive layers of lava, ash and ochre, reddish fossilized soils. Overlapping layers of lava, the product of quiet eruptions that marked the last stage of construction, can be seen particularly well at the top of the mountain range.

The abrupt transition from feudalism to modern times

The story of Gustavo Winter

Until the nineteen thirties, the headland of Jandía had been completely forgotten in history by the government. Manor property obtained by right of conquest in times of Castilian King Henry III of Castile, in 1403, either on a whim or by an oversight by the administration, had managed to dodge the abolition of the dominions decreed by the Cortes of Cadiz in 1811. In practice the ownership of this unique space (17,827 hectares of land) continued to belong to the heirs of the Norman conquerors for six centuries. They used to lease the property, and had more rights than those living in it. Untouched by progress and before the arrival of Europeans, the Aboriginal wall divided the island into two (or three) kingdoms, separating Maxorata from Jandía. The last tenant, Gustavo Winter, finally opened the doors of this remote territory to the modern age.

Mr Gustavo German, as he was known in Fuerteventura, was born in 1893 in a remote village of lumberjack cabins in Germany's Black Forest Mountains. Despite his humble beginnings, in 1912 he graduated in electrical engineering from the University of Freiburg. Responsible for the electrification of the Canary Islands, between 1925 and 1928 he designed and directed the construction of the Alfonso XIII Power Station. It occupied a side near the current auditorium „Alfredo Kraus" and is now defunct.

In 1937, barely a year after the start of the Spanish Civil War, Gustav Winter signed a "hire-purchase" contract for the pasture of Jandía, for 9,000 pesetas a year with its then owner the Earl of Girona and Mr. Angel Fiat Paul. In 1941 the estate was sold to the corporation „DEHESA de Jandía, S.A.". According to its statutes, their intention was Jandía's agricultural exploitation. In a notarized statement, buyers recognized the lessee to be G. Winter, ratifying and later extending the lease agreement he had signed in 1937. This agreement gives the tenant extensive rights and, in practice, G. Winter is master of Jandía. This, coupled with heavy investment in infrastructure and the tight control exercised by G. Winter in regard to this, gave rise to rumors among the agricultural and livestock community that Winter actually had another broader plan. This involved ultimately pursuing the installation, in the early 1940s, of a military support base in Jandía, in collaboration with the German intelligence service and with the approval of the then Spanish government.

After the Second World War, these plans were no longer pursued. In the 1950s the Winter

The track leads to the furthest village on Fuerteventura: Cofete





Villa Winter

family moved to Morro Jable, a village which began to attract people from Cofete, which became increasingly depopulated. Encouraged by the unstoppable expansion of tourism in the south of Gran Canaria and Tenerife, in 1960 Mr Winter decided to take the plunge into the tertiary sector which in practice meant the end of the last great manor estate of the Canaries. To do this, once he had obtained Spanish citizenship in 1958, he had no trouble in gaining control of the company Dehesa de Jandía and ownership of the land, and so he was able to promote his superb farm in Germany as a new touristic spot. The first hotel built in Jandía (and the first resort of Fuerteventura) was Casa Atlantica which had 50 beds. It opened in 1966 opposite El Matorral beach, two years before the Parador hotel of Playa Blanca in Puerto del Rosario. Access was via an unsurfaced road from Gran Tarajal and getting there was definitely an adventure. From there the expansion was unstoppable: Morro Jable, Esquinzo, Los Verodes, Costa Calma...



Agriculture

The traditional dry farming, (the most important centres in Fuerteventura are located around the villages of the interior), always had a secondary importance to livestock in Jandía. Its beginnings date back to the founding of Cofete in the early nineteenth century, although other agricultural activities were also practised in the past. Cofete in the nineteenth century was the only settlement in Jandía with a stable population, with about 100 inhabitants.

One hundred years later it would join the fishing village of Morro Jable, populated by livestock farmers and formed initially by fishermen from the north of Lanzarote and Fuerteventura. By the mid-nineteenth century agriculture was already well established in Jandía, as is clear from the work of J. Villalva, which in 1868 gave a description of DEHESA de Jandía, in that time belonging to the Count of Santa Coloma and Cifuentes in 1868, Marquis of Lanzarote.

This was a detailed study about the different parts of Jandía pointing out the springs and the ploughed areas, topsails, chains, houses, ponds, wells and other structures in each area. Besides Cofete, the main population centre, they had houses with gardens and orchards, located near many springs. The remains of some of them can still be seen today. Interestingly enough it can be said that in the surroundings of the house El Mosquito, located on the windward side before reaching Cofete, Villalva mentions the existence of two olive trees, which could be the same that are still there today , damaged by neglect and stray cattle. Agricultural activity is focused on the area around Cofete where tenant farmers settled. Villalva suggested that in Cofete „a lot of land is currently cultivated but potentially twice as much land could be farmed. In one day there could be enough work for a team of forty“. On the land on the opposite side, agriculture was lower.

With regard to the valley or ravine of El Ciervo, it has been said that „This is the only valley where there are still crops planted today, although in small quantities, as there are only two areas of sparse land, each about ten or twelve acres, which can be ploughed.” For the Great Valley it has been said that “Lands which have been ploughed in the past are now fallow, with nothing currently grown.” All this information paints us a picture of an agricultural activity whose intensity changed over time, depending on the circumstances. However, in the eyes of Villalva there still looked to be great untapped potential for the land to still be ploughed, as confirmed by the attention he devotes to it in every part of Jandía. Also, in his final statement he said that „Over much of Fuerteventura the land is completely without agriculture. Today a farming population of only about one hundred inhabitants means that the amount of cultivated land has greatly decreased“.

Another activity which can be considered in a broad sense to be agricultural is the production of sodium carbonate from the Ice-Plant (*Mesembryanthemum crystallinum*), which was very important in Fuerteventura in the eighteenth and nineteenth centuries. Traditional farming again had a boom in the nineteen forties and fifties, in the time of Gustav Winter. Three water galleries are still well preserved east of Cofete, (one on the slopes above the chalet Cofete, one in the ravine of Jorós and another in Esquinzo) were ponds were constructed and two others were built in Jorós valley. Over thirty wells were also opened across Jandía, with an average depth of 30-35 meters. In addition, Winter had built a vast wall around the perimeter of Cofete so cattle would not enter into this area, the remains of which, although badly damaged, can still be seen in several places (at the head of the

Vinamar ravine and at El Ciervo, near the summit of the mountain peak northeast of Mocán). In better condition is a threshing floor, situated on the slopes on the southeast of the village of Cofete. Apart from legumes and cereals for local consumption, at the time of Winter they first planted tomatoes on a large scale, which were then transported in trucks to Gran Tarajal and exported from there.

Traditional farming lasted until the early nineteen sixties, when tourism started. Today it is virtually non-existent, only the latest tomato plantations remaining in the Jorós area in the 1990s. There could be interesting results if an effort was made to re-cultivate areas such as the orchards of Jorós or Esquinzo, which could produce vegetables and fruit for local use. Today, like all foods, they are imported in mainly from other islands.

Remains of old orchards near the spring of Agua Camellos



Fish and shellfish and the capture of Shearwaters

The mounds of shells along the coast of Jandía are evidence of the traditional and widespread use of shellfish since pre-Hispanic times. The majority are from limpets (among which are the nowadays rarely found Fuerteventura-Limpets) mussels and barnacles. Shellfish fishing has increased considerably in modern times. The increase of frequent holidaymakers to this coast, largely from the other islands, together with the professional shellfish fisherman has led to overexploitation of resources. Currently, the fishing of shellfish is regulated and controlled, so that populations can recover.

The capturing of Cory's Shearwater chicks in their nests is widespread across the eastern Canary Islands. The main use is medicinal, as the oil of these birds is considered of great value in the treatment of respiratory diseases, especially in children. They can be consumed as they are or salted, and were caught in large quantities for this purpose.

Shearwaters are currently legally protected, making it prohibited to catch both chicks and adults. Nonetheless, the catching of chicks still continues in Jandía and in other areas, although not so commonly. Instead of being a full-fledged economic activity it's now a clandestine one, albeit moderate, a traditional resource still used by some for personal consumption.

Fuerteventura Limpets



Plant fortresses

The soft curvature of the vast area of the Arco de Cofete stretches from the Punta del Pesebre to the isthmus of La Pared. On the interior slopes, at a height of between 50 and 400 meters, large groups of lush plants can be seen which are immediately identified by many as „cactus“. This is the best part of the island to see them up close without having to walk too far, as they can be found close to the track that descends from the Agua Oveja to the village of Cofete.

Canarian ´Cardones´

The Canary Island Cactus-Spurge - or Cardón - despite its external appearance, has nothing to do with a real cactus. They belong to the family of euphorbias, characterised among other things by the highly toxic white latex that they contain. They are found on all the islands except Lanzarote and give great character to the landscape in parts of Tenerife and Gran Canaria.

The Canary Island Cactus-Spurge is rare in Fuerteventura, growing only in the area of Cofete and some other areas of Jandía's peninsula, like on the Montaña Cardón. However, some of the most impressive examples in the Canary Islands are found right here forming huge fortresses of greyish-green plants, with hundreds of branches ascending from a quadrangular trunk and covered with pairs of short spikes along the edges.

They can grow to over three meters high and occupy areas of several hundred square meters. In the middle, where they are safe from goats and rabbits, it is not unusual to find shrubs like the Shrubby Madder, the Smooth Periploca and the Eastern Canaries Climbing Aspargadus. Nearer to the sea are the Ifni-Seepweed and Tenflowered Coast-Bush. The first is restricted to some of the Canary Islands and the Western Saharan coast, the latter is widely across the desert areas of North Africa and the Middle East and has its largest populations in Jandía.

Both species don't only grow where they are protected by spurges, but are also scattered down the hillsides. The Tenflowered Coast-Bush prefers to grow in small troughs that catch the water when it rains. Good examples of this can be seen around the area of Agua Oveja and along the track which runs through the gently sloping plains towards the Jandía lighthouse. The downside to this is that most of the examples of these bushes are in easy reach of herbivores and in summer they are severely nibbled. A series of dry years has reduced the number of individuals to a minimum leaving only small twisted trunks with few branches totally devoid of leaves. However, a wet year works miracles and in just a few weeks they will return to life with their lush appearance, covered with thousands of small yellow stars in winter. The Ifni-Seepweed meanwhile, does not seem as desirable to the goats or rabbits and is hardly touched.

The Canary Island Cactus-Spurges bloom in spring. Yellow inflorescences appear at the top of the branches and as with all euphorbias they have nectaries along the edges, small elongated structures that produce nectar. This substance is sought after by ants, flies and small beetles, which are readily seen on these flowers, but they attract only a few butterflies.

In summer they form deep red fruit capsules. Generally each fruit has three capsules, each with a seed, but there are also some with four. On a hot day in August or September, these capsules explode with an audible snap, throwing the seeds over several meters.

However, the profuse blooming of the Spurges doesn´t always result in a good production of youngsters. Many capsules are parasitized by the larvae of small moths that feed on the seeds. The seeds that reach the ground are eaten by birds and rodents, and some of the seedlings that might start to grow are destroyed by goats trampling them.

Therefore, the reproduction of plants is rare.. The long life and resistance to adverse conditions make the population of spurges more or less stable. That said, for unknown reasons several adult plants have died over recent years so studies are now underway looking for suitable measures to manage and conserve the species.



Jandía-Spurge

Fuerteventura is the only isalnd of the Canarzs which has second species of cactus-like spurge: the Jandía-Spurge. It is exclusive to the island although it is very closely related to a spurge found in Southern Marocco. It doesn´t grow in the area of Cofete, but populations of this species are found in the middle and lower area of Gran Valle, along the route which is recommended in this chapter.

It´s smaller size and much longer spines make it easily distinguishable from the „Cardón". It reaches a maximum height of between 1 to 1.5m, although most plants are considerably shorter. Some branch from their base, while others have branches coming out higher on the main trunk. The inflorescences and fruit capsules are much smaller than in the Canary Cardon, but the time of flowering and fruiting and the mechanism of seed dispersal are the same. The Jandia- Spurge also faces an uncertain future. In some places populations are good, with individuals of various ages and good rejuvenations, but in other places many individuals have died in recent years and haven´t been replaced. It's possible this is related to pathogenic fungi, but the cause is not clear, which leaves another area in need of extensive research.

Moquin's Saltbusches

Another type of vegetable fortress is created by the Moquin's Saltbusches. In Cofete they are scattered throughout the beach and the locals call them „matos". They have neither spikes nor toxic latex, but form large and dense rounded bushes of up to 8m in diameter. Other plants sometimes grow inside, keeping them more or less protected from the strong sea winds and various herbivores that venture near to the shore. Sand often accumulates around the bottom of the plants, crowning a small dune that they themselves have helped to form.

The Moquin's Saltbush belongs to the family of the Chenopodiaceae such as seepweeds, the Glaucous Glasswort or „Salado" and the different species of saltworts. It's leaves are small and fleshy, and it's tiny yellow flowers, that appear in summer, can only be seen if you look very carefully. As with most coastal plants, Moquin's Saltbush seeds can float a long time in seawater and then disperse. Therefore, this species is found along the coasts of the Canary Islands and the neighbouring continent from southern Morocco to Mauritania.

Moquin`s Saltbush



Freed slaves

The area of Cofete is home to the majority of the wildlife that can be found in the municipality of Pájara. However, we can´t overlook an animal that does not strictly belong to the fauna in the full sense, but is, in a characteristic way, from Jandía; we are talking about the domestic donkey, which still lives in small herds in the wild in the area of Cofete and on parts of the Sotavento coast.

They travel in groups of up to 6 or 7, moving at night through inhabited areas in search of food. They can also be seen near the salt marsh of El Matorral and in the adjacent urbanized areas during the day where they are sometimes fed bread and vegetables by passing tourists.

The Majorero Donkey

They descend from donkeys that were used in the past for farm work, and are part of the breed called „Burro Majorero“, officially recognized in 1997 by the state. Of the 6 races of Spanish donkey, it´s the one which is more closely related to the African ass. It seems certain that the donkey was introduced by Europeans soon after the conquest of Fuerteventura from North Africa. The Majorero donkey is grey and has a dark stripe running down its back and small horizontal stripes at the bottom of their legs. This last marking is also found in the very few surviving African wild donkeys in Somalia and Eritrea. There are also white donkeys found amongst those in Jandía. Their colouring is due to degeneration of the species as a result of the inbreeding of these animals. The local breed came close to extinction, but today associations such as the Group for the Conservation and Promotion of the Burro Majorero are dedicated to breeding and guidance on upkeep and reproduction. They are also working to establish a family tree of the Fuerteventura donkey in collaboration with the Government of the Canary Islands, the Cabildo Insular de Fuerteventura and the Faculty of Veterinary Medicine, University of Barcelona.

Two donkeys saying ‚Hello´on the plains of Cofete



Two `Burros Majoreros` on a farm in the south

Wild donkeys in Jandía





The Majorero dog

Talking about domestic animals, we must als mention the Majorero dog or ´bardino´, officially recognized as its own breed by the Spanish Royal Canine Society in 1994, whose breed standards were published in 2001. Brought over by the pre-hispanic inhabitants more than 2,000 years ago, this strong medium-sized dog is a popular guardian of both home and livestock and is reputed for being loyal and brave. Its coat is predominantly black or dark grey, with often vertical tabby stripes, ranging from brown to beige, starting at the spine.

Very rarely will you find a house or farm in the Majorero countryside without one or more of these dogs. While some spend a sad life tied to a chain, others get to show their true capabilities, working with the farmer in the monitoring and collection of livestock. Many of the dogs that you see are not purebred, but are mixed with other breeds such as the Presa Canario or sheepdogs from other places. As is the case with the Majorero donkey, there is an Association for the Conservation of the Majorero Dog. With more than 100 members at present, they aim to keep this breed pure so that it doesn´t end up being diluted by any of the other breeds of dogs that have been introduced in Fuerteventura.

The war of the mice

In several areas of Fuerteventura, including some small gullies and ravines in the slopes of the Cofete area, paleontologists have found remains of small mammals such as the Lava- Mouse and the Canary Shrew, along with those of reptiles such as the Simony‘s Skink, the Fuerteventura Lizard and Fuerteventura Wall-Gecko. All these species remain in existence except for the first, which became extinct in historical times, probably because of the impact of the unintentional introduction of the common mouse and pets by the first human inhabitants, between 2,500 and 2,000 years ago. Robust, about 20 cm in length and 40 grams in weight, it is estimated

that the extinction of the Lava Mouse, who lived in Fuerteventura, Lanzarote and the islets, occurred between 800 and 600 years ago. The hopes first harboured by some biologists of finding a relict population in some remote place are fading as the years pass.

The older, lower layers of some sites still have abundant remains of this species, while findings of the remnants of ordinary mice are increasing in the new layers. It must have been a slow and cruel battle for available resources, one which was finally won by the abundant and adaptable common mouse, and one that was certainly helped by the dogs and cats that always accompany human beings. Today the common mouse can be found everywhere in Fuerteventura in both towns and cities as well as far from human settlements. Interestingly, and somewhat unexpectedly, recent molecular research has shown a close phylogenetic relationship between the Lava- Mouse and the modern mouse of the genus *mus*. The Lava-Mouse may have derived from an ancestor who arrived no less than 7,000,000 years ago from the African continent.

The Canary Island Shrew

The Canarian Shrew had better luck than the Lava-Mouse. Also endemic to the eastern Canary Islands although it is by no way as abundant and suffers greatly under the pressure of domestic and feral cats that give chase but rarely eat it. It is also captured by the Barn Owl. Shrews are small carnivorous mammals that look like mice, but with a longer and pointed snout. Despite their appearance they are not actually related to the mouse, feeding on insects, spiders, worms and even lizards. Her secret life, hidden among the low vegetation and in the cracks in the lava fields, the stony hillsides and ravines which have some moisture and vegetation is so well hidden that their presence went unknown to scientists until 1984, and they were declared as their own species three years later.

Just 30 years later, the Canarian Shrew is today among the most endangered animals in the archipelago. Studies are being sponsored by the Cabildo de Fuerteventura to try to curb its negative population trend.







Mariout-Milkvetch



Shrubby Madder



Famara-Reichardia



Canary Island Rockrose



Arminda Majorera



Stone Curlew



Canary Stonechat



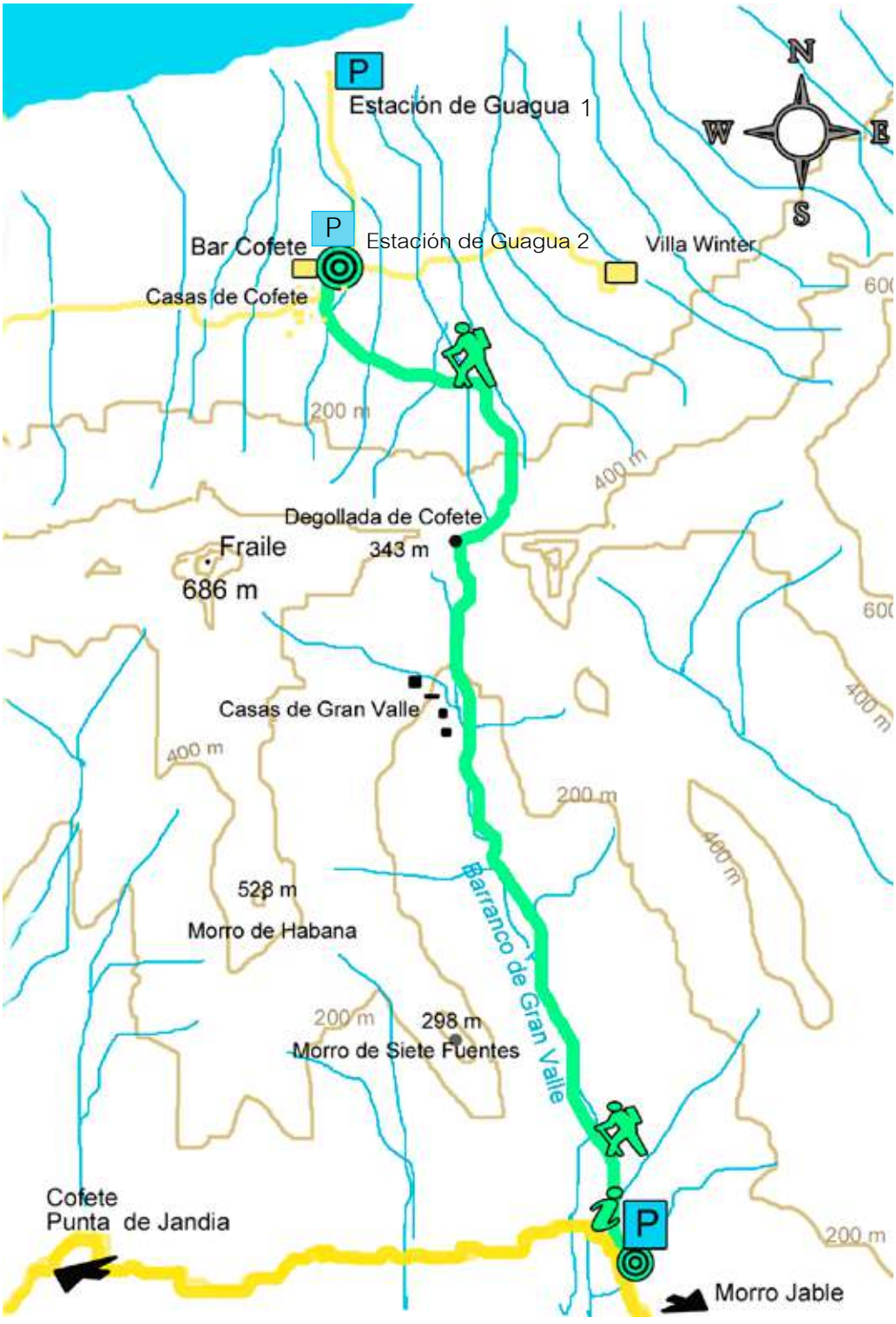
Common Raven



Cream-Colored Coursor

Recommended route : Gran Valle - Pueblo de Cofete

Level of difficulty: medium
Elevation: 300 m
Distance: 7 km
Duration: 2 – 2.5 hours



Description:

Follow the track to Cofete-Punta de Jandía, which starts in Morro Jable near the port. About 500m after passing the Cemetery of Morro Jable on your right, there is a carpark. Here you will find the beginning of the trail which leads up to the Gran Valle and to Cofete, at a height of 343m above sea level. This mountain pass leads down to the small village of Cofete. This is the PR-FV 55 Nature Trail. You can make use of the bus service to go back to Morro Jable or return along the same path. Make sure you check the bus timetable at the Tourist Office in Morro Jable beforehand.











Montaña Cardón

Montaña Cardón is located in the southwestern part of Fuerteventura. The mountain is visible from a considerable distance and gives character to this part of the island. On its eastern flank is the village of Cardón (135 inhabitants), which is reached by the FV-618. On the western side is the hamlet of Chilegua. It consists of an old house with a wall, which belonged to the Lords of Fuerteventura, which is surrounded by sharecroppers' houses. The FV-605 (Costa Calma-La Pared-Pájara) runs past Chilegua. You can take the FV-617 to get to the southern part of the mountain.

The Montaña Cardón is a protected natural area, categorized as a Natural Monument (1266.8 ha). The entire land is privately owned. Since January 2010, 1,233.6 hectares of this space have become part of the Natura 2000 Network as a Special Area of Conservation (SAC).



Natural forces have formed this rugged terrain. The `castillete` stands at the north end of the mountain

Modeled by erosion

From a considerable distance, the Montaña Cardón stands out in the landscape as an imposing elongated massif, the second largest and highest in the south of Fuerteventura after the Jandía peninsula. In fact, it is a mountain range with a „V" shape with the apex pointing north. Only the eastern stretch, which runs for about 4.5 km from north to south with a height is called Montaña Cardón. A long plain runs along the top of the mountain which reaches 691m at its highest point. Along the sides, the land falls into vertical walls, the majority of which are inaccessible. They form protective shelters filled with native flowers and a place for nesting birds of prey.

The western side is part of the common vertex and extends in a northeast - southeast direction. Even though it is shorter and lower it is no less rugged and steep, and is called Espigón de Ojo Cabra. In the northern part, on its peak, are two prominent rocky areas that appear as impregnable castles against the horizon. In fact, they are called „Castillete". In between the two sides or arms is a valley whose bottom gently uphill towards the convergence point.

Montaña Cardón is a fragment of the old volcanic building called by geologists the „Central block of Fuerteventura“. In this block they have found rocks that date back 22 million years, but its origin may be even earlier. It is the largest of the three Miocene shield volcanic blocks that together, after erosion, make up the present island. The remains of the main mass, which reached a diameter of more than 40km and a height greater than 3,000m, extend in a semicircle in the southeast part of Fuerteventura. It runs from Pozo Negro passing through Gran Tarajal and La Lajita to Montaña Cardón. It consists of elongated hills, which in Fuerteventura are called „knives“ because of they appear to have sharp looking crests. Montaña Cardón is a ´knife´. They are a result of fragmentation due to water erosion of a shield volcano.

Aboriginal remains of buildings - later used by farmers



Mahan‘s grave

Montaña Cardón was very important in the life of the ancient inhabitants of Fuerteventura. Pasture for livestock, wood and water were prerequisites for the settlement of a permanent population. There are many archaeological sites in the area dating back to the Majos. Generally these are pastoral structures, near which ceramic fragments are commonly found. Also preserved on a hillside on the southwestern tip of the mountain, near the village of Guerime, are remains of old houses. They are round with dry stone walls as are all Aboriginal constructions. They are attributed to the pre-Hispanic inhabitants, although some of the houses were reused by locals in relatively recent times.





Former agricultural land on the western slopes of the Montaña Cardón

Montaña Cardón however was not simply an area of pasture for livestock, but one which may have also had magical and religious significance to prehistoric inhabitants the same as the mountain of Tindaya in the north of Fuerteventura. This conclusion is based on the presence of some rock carvings. An ancient legend, dating back to the sixteenth century and even echoed by Miguel Unamuno himself, says that in a cave located at the top of this mountain lies the tomb of the giant Mahan. Mahan was a mythical hero who, according to the legend, had 64 teeth and was 22 feet tall.

The area of Montaña Cardón has traditionally been dedicated to agriculture and extensive livestock farming. Crops were primarily grown on the farm area of Chilegua, and on the western slope of the mountain. Chilegua consists of an old house that belonged to the former lords of the island, and in the vicinity are several modest houses where workers or sharecroppers lived. Terraces are also preserved on the eastern slope of the mountain, formerly used for the production of cereals and pulses.

The fountain of Tanquito



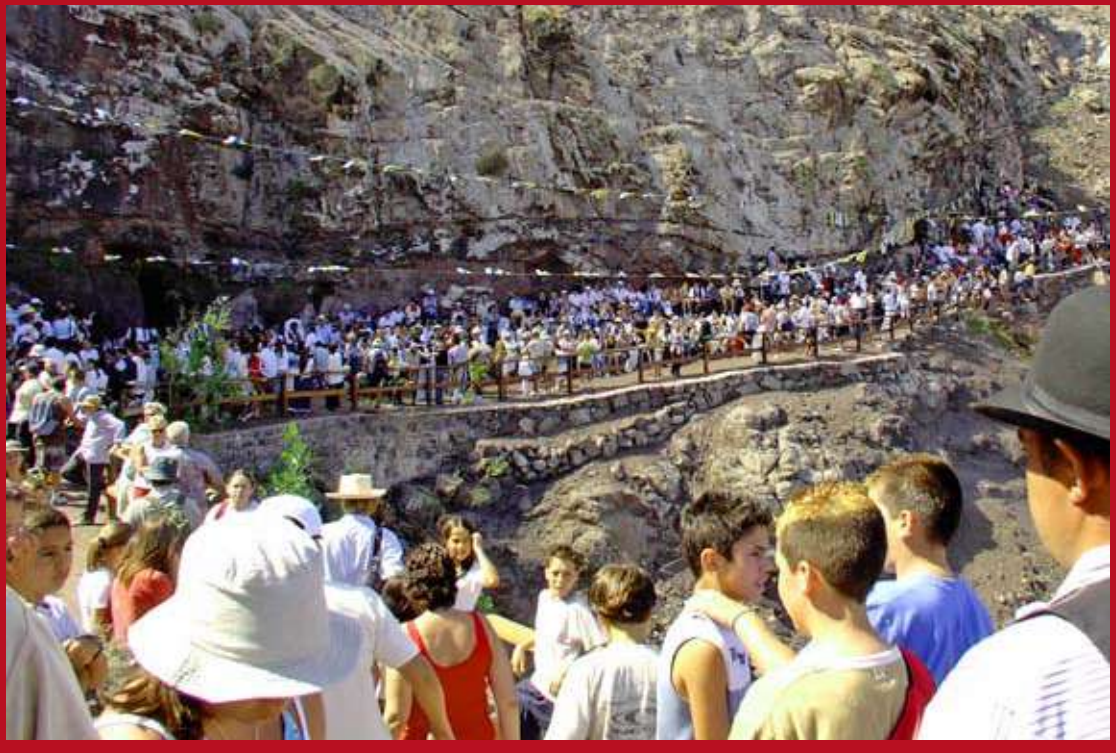
El Tanquito

On the western side of Espigón de Ojo Cabra halfway down the hillside there is a permanent source of water. It doesn´t produce a lot of water but it is very good quality spring. In ancient times residents from neighbouring villages would come to collect water. It is highly likely that this was a sacred place for ancient Majos and related to the worship of water that gave life. Now it is a small Marian shrine dedicated to Our Lady of Tanquito. A small opening in the rock that is used to fetch water, leads to a small cave that has been converted into a chapel. There is a small tank or Tanquito built next to it to collect water in accordance with an ordinance from the local Council ensuring good use of springs and waterholes, hence its name.

In the past people who collected water saw figures in the slabs of stone in the wall and believed them to be the Virgin‘s face. They began to ask for favours and covered its walls with votive offerings, letters of thanks and all kinds of souvenirs. Nowadays many people who are about to take their driving test go there to ask for help. After passing their test they leave their highway codes as a gift. Since a Marian Statue was placed in the chapel in 1981, on the first Sunday of May each year a multicoloured pilgrimage, following the image, climbs up from Cardón to El Tanquito.



Pilgrimage in honor of Our Lady of Tanquito in 2010.





Flowers of the Sow-Thistle

The Pinnate-Leaved Sow-Thistle finds shelter in the crevices of the rock.

Shelters for endemic flora

Nowadays, the vegetation on the Montaña Cardón and its surroundings consists mainly of a thicket of Spiny Lettuce and other bushes, the result of many centuries of grazing and the collection of firewood. However, remnants of the original vegetation which covered the area before humans arrived still remain. On both the Eastern and Western side of the mountain there are plants of the King-Juba-Spurge which have in part returned to recolonize old cultivation terraces. On the eastern edge you can find Canary Island Cactus-Spurge, the only ones that exist on the island apart from those in Jandia, alongside groups of Balsam-Spurge

In the not too distant past there were also groves of Canarian Olive trees. Today just one huge and ancient individual remains. It's estimated to be at least 150-200 years old and sits on the hillside on the western slope of Montaña Cardón, above the houses of Chilegua. Several smaller specimens, most of which are also of considerable age, are scattered throughout the area.

It is precisely these ´riscos´ that surround the top of the mountain that are most interesting from a botanical point of view. Rock plants such as Pinnate-Leaved Sow-Thistle, Arabian Scurfpea, Canary Crooked Flower, Willow-Leaved Carline-Thistle, Aspargadus y Pinnatifid-Leaved Andryala live here. The Pinnate-Leaved Sow-Thistle is relatively common. This species grows to more than a metre high and is found in the eastern Canary Islands, where it is relegated to a few mountain ranges, and in some coastal areas of Morocco. Its large yellow flowers appear in March and April. The Arabian Scurfpea with its beautiful blue flowers often grows close by.

Famara Vipers-Bugloss





Fuerteventura-Sage

The Canary Crooked Flower is a plant exclusive to the Canaries and well adapted to arid climates. They can be in bloom almost all year round. Meanwhile, the Famara Viper's Bugloss is unique to Lanzarote and Fuerteventura, where it only grows in Jandía and, sparsely, on the Montaña Cardón. This interesting gallery of rock plants also contains various other species, but nevertheless, it should be noted that the area where they grow has no paths and is difficult to get to. We recommend that it only be accessed by people with some mountaineering experience.

Old individual of an Canary Olive-Tree





Field-Marigold during the winter

Hunters of the sky

As in other areas of Fuerteventura, most of the terrestrial vertebrates of Montaña Cardón are birds. Throughout the year at least 15 species can be seen, many of which breed in the area: Aegyptian Vulture or Guirre, Buzzard, Kestrel, Barbary Falcon, Raven, Barbary Partridge, Rock Dove, Barn Owl, Plain Swift, Hoopoe, Berth, Berthelot's Pipit, Canary Stonechat, Spectacled Warbler, Majorero Tit, Canarian Shrike, Trumpeter Finch and Linnet. Others are occasionally seen as well.

Canary Buzzard

The common buzzard is found throughout Europe, North Africa and much of Asia. In this wide area they have created many subspecies or races. In the Canary Islands lives a somewhat smaller and darker subspecies than that found in Europe, called „Aguililla“ or „Aguellilla“. The buzzards live in several mountainous areas of Fuerteventura and couples remain faithful to a certain territory for many years.

The Montaña Cardón is one of the places where you are almost certain to find them. They are usually heard first, Identified by its plaintive cry that could be transcribed as a fine „piuuuuh“. To find the source simply look up where you´ll see one or more buzzards flying in wide circles, sometimes around a mountain top, where they nest. It is not uncommon to see them perched on rocky promontories or even on power lines or telegraph poles.

This bird has increased in recent decades in Fuerteventura. Probably one of the reasons for this is the rapid colonization of the island by the Barbary Ground Squirrel, which began in the 1970s, and is now abundant in many parts. The buzzard is the only bird who gives chase, as it is too big a prey for the common Kestrel and the Barbary Falcon, which only captures birds in flight.

The buzzards fiercely defend their territory, even against human intruders. If you are near the nest, it is not uncommon for them to fly past, low and from behind, falling sharply from above and steeply returning after passing just a few metres above your head. However, these intimidating attacks are purely that. These birds do not physically assault people, as can indeed be the case, albeit very occasionally, with other birds of prey such as the buzzard or the sparrowhawk, that do not breed in Fuerteventura.



The Tagarote or Barbary Falcon

This hawk lives in arid regions from the Canary Islands to central Asia. It is very similar to the Peregrine Falcon, so much so that some zoologists consider of it. It is a bit smaller than most of the subspecies of the Peregrine Falcon, at 34-40 cm long with a wingspan of 80-100 cm. Like most falcons, the female is slightly larger than the male. Apart from size, the Barbary Falcon differs from the Peregrine in its colouring. It is reddish brown with a brown stain on the back of its head.

Its flight is spectacular in terms of speed and maneuverability. It hunts in the air, feeding on other airborne birds. It breeds and lives in rocky walls along the coast and inland. During the breeding season in spring, pairs defend their territory against other pairs as well as raven, hawks and other birds of prey.

It is sometimes possible to catch an unexpected glimpse of its very fast persecution of another bird, or of it circling in the sky while searching for its prey. However, the Barbary Falcon spends much of the day perched on a cliff, where it is difficult to spot.

Up until 20 years ago, the Barbary Falcon was considered the rarest and most enigmatic species of bird in the Canaries. Apart from two or three pairs who lived on the small islands north of Lanzarote, their presence on the islands was only known due to ancient references from the nineteenth century.

From the middle of the 1990s the number of pairs started to grow, along with our knowledge about their biology in the Canaries, which until then was practically nonexistent. Now it breeds on all of the islands. Its legal protection is one of the reasons for its increase in numbers, as well as the increased availability of some of its prey, especially the doves, now ubiquitous in many parts of the archipelago.



Barbary Falcon

Kestrel



The Guirre or Egyptian Vulture



This vulture, the only strict scavenger in the archipelago, also inhabits the area around the Montaña Cardón. It is considered a „noble bird“ by farmers and ranchers as it doesn´t attack livestock or other animals, instead it feeds on animal carcasses and rubbish therefore cleaning the fields. Just a century ago it was abundant in most of the archipelago, but the changes that occurred to the traditional agricultural landscape, with the proliferation of power lines and roads, began to make its life difficult. The massive use of insecticides like DDT which is now banned, added to the problem. After becoming extinct in the western and central islands in the 1980's, Fuerteventura and to a lesser extent Lanzarote and its smaller surrounding islands became the last refuge for the Aegyptian Vulture in the Canaries. With just over 20 pairs left in the early 2000's, a recovery plan, partly financed with European funds from the LIFE program, was put in place. These funds arrived just in time and laid the foundations so that today the island boasts 50-55 breeding pairs.



Three Vultures eat a dead baby goat



A young vulture with his dark plumage

However, the future of this vulture is not assured. Illegal poisons, power lines that are not adapted to the presence of birds as well as high levels of lead and other environmental poisons which find their way into the blood of the vultures means we must remain vigilant. We need to continue taking steps to ensure that its iconic silhouette doesn´t disappear from the broad Majorero plains.

The birds make their nests in small caves in rocky cliffs and cover them with goat and sheep hair. They usually lay two eggs in April, and the young start flying in July. In their early years they are dark brown. They reach sexual maturity in five years, find a mate and then look for a territory of their own to breed.





Field-Marigold



Pinnatifid-Leaved Andryala



Famara Viper`s Bugloss



Tree-Asparagus



Sventenius`Sea-Kale



Flowers of the Canary Crooked Flower



Canary Island Dog-Mustard



Western Bellflower



Chios-Storksbill



Arabian Scurfpea



Artichoke Thistle



Mountain Fumitory





Arabian Scurfpea



Pinnate-Leaved Sow-Thistle



Cretan Fagonia



Fuerteventura-Sage



Selvagen`s Snapdragon



Flowers of Canary Olive Tree



Horned Hedge-Mustard



Lanzarote Bird`s Feet Trefoil



Hercule`s Mace



Catchfly



Two males of Trompeter Finch



Hoopoe



Great Grey Shrike



Common Raven



Lesser Short-Toed Lark



Stone Curlew





Neoscona crucifera



„Araña de pinzas“



Canary Island Scorpion Spider



„Araña masona“



Canary Island Camel Spider



Hogna-Wolf Spider



Atlantic Lizard



„Campalita de Olivier“



Larva of the Hawk-Moth - Hyles lineata



Larva of the moth Polytela Cliens



Death`s Head Hawk-Moth

Recommended Route: Montaña Cardón



Route 1: Climb to the shrine of Our Lady of Tanquito

Level of difficulty: Medium
Elevation: approx. 110m
Distance: 2km
Duration: 2 hours (round trip)



The climb to the chapel of the Virgen del Tanquito starts from the car park located 2.6km north of Cardón village, along the FV-618. An information sign marks the site. The trail ascends the hillside westwards. Halfway up you come across a small esplanade. In the middle of a circle of stones there is a pole with a stand which is used in the pilgrimage of El Tanquito, when they carry the Virgin up from the village. From this point the trail runs along the northern side of the mountain, where you can enjoy spectacular views of the north coast, and catch glimpses of Cofete's coast.

At the end of the path there is a small cave that has been excavated by a natural spring. The chapel is a few metres further. You´ll also find an oven, barbecue and small pond/tank that gives the place its name, as well as benches and seating areas.

Route 2: Path from El Cardón to Guerime

Level of difficulty: Easy
Elevation: approx. 150m
Distance: 3km or more
Duration: variable



This route leads from the church square in the village of Cardón to the houses of Guerime. This route is part of the Nature Trail (GR-131) which continues to the south of the island. Groups of beautiful Canary Cactus-Spurge and Balsam-Spurge can be seen up the hillside from the track. They are remnants of the natural vegetation which was once more widespread across this area.



Ajuy

1.5 km west of Pájara there is a road junction where you take the FV 621, which leads directly to the coast of Ajuy. This area is part of the Rural Park of Betancuria as well as a Natural Monument in its own right.



The roots of Fuerteventura

At first sight it appears to be just another beach in a small fishing village in front of cliffs, facing a mighty and difficult sea.

What makes Ajuy different? Basically the rocks. It has a hidden wealth in its amazing geology. Its oddly shaped rock face which looks out over the Atlantic is a real ´outdoor classroom´ for those interested in learning about the birth of the Canary Islands. Part of the basal complex of Fuerteventura has been found here, the oldest geological material in the archipelago.

The basal complex, as the name suggests, is a geologically complicated solid rock mass. It actually covers all the so-called Macizo de Betancuria which is the midwestern part of Fuerteventura, but its different layers are especially visible in the ravines of La Peña and Ajuy, and are regularly visited by geologists. The basal complex corresponds to the submarine phase of growth of Fuerteventura, before the island began to rise above the sea.

In fact, geologists now prefer to call these complicated geological formations that form the basis of the Canary Islands the “submarine phase“. They are present on all the islands, but they are only visible in a few places on some of them, such as the Macizo de Betancuria in Fuerteventura.

Why are these ´submarine phases' so complex? Instead of imagining the process as a simple layering of lava coming out of a submarine crater and extending the seabed, imagine it as the magma rising and passing laterally through different layers of pre-existing rocks and seabed sediments. This therefore creates a kind of bulge, with layers of lava and layers of ancient seabed, which constitutes the base of a future island and contributes to the growth of the main block towards the surface.

The continuous underwater volcanic eruptions created numerous magmatic dikes through the original block forming intrusive narrow paths. Earthquakes turned them over, compressed them and divided them. They then underwent intense erosion and new rejuvenation processes that transformed them again and again a thousand times. A real creative upheaval to the foundations of what later, only 22 million years ago, would emerge from the water as the early stages of Fuerteventura.

For this reason all components of the basal complex have their submarine origin in common. Up to 180 million years old, they were formed by the effects of a slow sedimentation on the seabed or by other violent or intense volcanic activity. In Ajuy we can see some of the oldest and most interesting components, Ftanitas. These grey rocks that are sandwiched between other layers, are formed by sediments that were deposited in the ancient ocean floor. They were contemporaries of the Jurassic marine reptiles that swam in the primitive Atlantic Ocean at a time when the American continent had just begun to separate from the African continent opening a vast sea through the middle. When they were formed in the deep sea, the Canary Islands had not even started to develop.

If they were at the bottom of the sea before Fuerteventura existed, how did they get up to the surface? There was a period of nearly 13 million years of almost no volcanic activity. Intense erosion slowly changed the shape of the now emerged main land mass and exposed the previously buried layers.

Old beach lifted and eroded by wind





Ancient seabed sediments on which Fuerteventura emerged

The extraordinary loss of weight, coupled with internal earthquakes, caused the submarine base to gradually rise. That is to say that the bulk of Betancuria suffered a sharp rise after the volcanic rocks which covered it were almost completely removed by erosion.

More recently, but still several million years ago, basaltic lava from nearby volcanoes renewed profiles of the coast. The constant, powerful and merciless action of the waves cutting into it to form cliffs. The noise of these waves breaking against the rocks resounds in the depths of the caves which they themselves dug into the cliffs. It is precisely these caves, carved by the sea, which are reached by a well-marked path, one of the attractions to visit in Ajuy.

In the Quaternary time, different variations in sea level created white-sandy beaches that with time, as the level of the ocean dropped and as the land rose, were abandoned high on the cliffs (14 meters). There they became fossilized between layers of basalt, along with an incredible variety of molluscs whose shells can still be found among these frozen sand mounds known as raised beaches. Parallel to this you can see a thin but hard calcareous crust of „caliche“ on the surface of the upper plains, a ´stone skin´ made up of soils covered by sand which during wet periods has a rapid process of carbonation.

But this interesting geological setting is not the only thing that Ajuy and its surroundings have to offer. Its plains, chasms and cliffs, besides the scientific interest, are an important scenic treasure with their round shapes and sinuous lines, not forgetting the intense colours full of contrasts between this tortured land, the clear sky and the stormy sea.



Lime kiln dug into the cliff

Coastal quarry used for the extraction of „caliche“



Caves for a port

Not everything in Ajuy is rocks and stones. There is also history, lots of history. In the early fifteenth century the first Norman conquerors landed at the old Puerto de la Peña, annihilating a primitive aborigenes society, who was overwhelmed by the advance of their European conquerors, replacing the old culture with their own.

The bay of Puerto de la Peña was later recognized as an important place of import and export of products from small businesses in Fuerteventura during the following five centuries.

This place with a strange name and little standardized toponymy (Ajuy, Ajuí, Ajui and even Hahui) was once a strategical port due to its location. It was the only major port on the Majorera windward coast with its own natural protection, keeping it hidden from the watchful eyes of the fierce Berber pirates. The port of Betancuria, the first city in the Canary Islands and also the main port of Pájara, soon became powerful links for the island with the world outside. Evidence of this can still be found on the beaches and nearby coves where the anchored boats would wait to be loaded with their goods.

An ethnographic study of this region produces more evidence of the lime industry (difficult, complicated work) than that of fishing. It was supplemented with a coastal trade specializing in the buying and selling of grain and livestock and also the ´Orchilla´, the precious Staining Lichen that is the source of a dye and which was collected for centuries among the high cliffs of Jandía and the Montaña Cardón.

Of great importance during the seventeenth and eighteenth centuries, calcium oxide obtained from the slow burning of „caliche“ in many lime kilns scattered throughout Fuerteventura was shipped through the Puerto de la Peña to the rest of the Canary Islands, especially to the ports of Santa Cruz de Tenerife, Garachico, Santa Cruz de La Palma and Las Palmas. For centuries it was the only cement used in construction, mixed with sand as a building mortar or used as a plaster and applied directly onto the walls of a house.

Several stone kilns owned by the county can still be seen along the coast. They are remnants of this semi-industrial activity which produced white



A wooden railing ensures safety of the trail

lime, the finest and most valued, used to paint facades and common lime for construction.

Coastal ramps and holes which were used to move the lime onto the boats are still visible, besides other buildings such as customs, where the goods were taxed, and even several caves which were used as warehouses for the lime.

From this spectacular vantage point the scenery is breathtaking





Palm trees near the ravine the Madre de Aqua

Trees that cry salty tears

Today, the area of Ajuy can no longer offer an expanse of Balsam-Spurge that, in all likelihood, once spread across the plains covering the now barren terrain in bright green. The arrival of humans 2,000 years ago marked the beginning of the end of this peculiar carpet of vegetation. For centuries, as nature refused to offer any other type of wood, the Spurge was ripped out, dried in the sun and then used as an important source of fuel. Therefore, the little that was left by the goats finally ended up being burned in homes or in lime kilns. However, portions of this ancient splendor are still preserved further inland, in the high hills of Betancuria, especially in the area of Toto and Pájara.

The moon above two beautiful Canarian Palms



The Canarian Palms which are now found on the lower slopes of the mountains and ravines with seasonal or perennial humidity were also once more abundant in the valley from Ajuy to Betancuria. This was the case back in the early fifteenth century when the Norman Jean de Bethencourt and his soldiers passed through here to explore and begin their conquest of the island. The chronicles written by one of his companions speak of 900 palm trees and permanently flowing streams. Palm trees, along with Olive trees and Mount Atlas Mastic Trees, suffered the same fate as the Spurges and for the same reason. In spite of this, there are still beautiful and dense



Palm trees and fields go hand in hand in the agricultural landscape of Fuerteventura

clusters of them, especially in the area known as „Madre del Agua“, a few kilometres up the valley from Ajuy. The Canarian Palm is native to these islands but widely cultivated for ornamental purposes in many areas of Mediterranean climate around the world. Nowadays it is also produced in large numbers in nurseries and often used in gardens and along roadsides, so its survival is not in danger. This species is closely related to the North African date palm, but as its fruits are smaller and not very sweet, they are only eaten by livestock.



A group of Canary Tamarisk near the Playa de la Solapa

The Canary Tamarisk was also luckier than the Spurges and is very common in the lower parts of the ravine in Ajuy and many other ravines on the island. They form dense clumps of up to 5-6 m high, preferably in places with brackish water, both on the coast and inland.

The Canary Tamarisk can excrete salt through its thin leaves, and you can often see small raindrops hanging from its branches like tiny salty tears. It's precisely the ability to extract salt water from the subsoil and then deposit a layer of salty leaves on the soil surface, making it sterile for many other plants, which makes the Canary Tamarisk unwelcomed by farmers in the vicinity of their crops.

The typical trunk of an old Canary Tamarisk





Salt water droplets glow on the branches of the Canary Tamarisk in the morning sun

But as its hardwood was of great value for farm implements, looms, crossbars and keels of small boats, the cutting down of this plant was always tightly controlled.

During the seventeenth and eighteenth centuries zealous and vigilant guards were named to exclusively protect these bushes. These in Ajuy and La Peña were the most important on the leeward side along with those of Ugán, Vigocho, Amanay and Chilegua, further south.

A sea of birds

The area known as Puerto de la Peña is actually a great cliff amphitheatre of 700m. Its semicircular shape, which serves as protection from the strong currents in the area, makes it ideal for anchoring boats. Although stark and dramatic, its walls support a rich fauna, which is why this space has been listed by the European Union as a Special Area for the Protection of Birds. The Barbary Falcon has recently re-colonized in some rocks that had once always been theirs, making it possible to spot them on their usual perches or chasing fast unsuspecting pigeons which nest in the caves carved by the sea.

The Plain Swift breeds in the cracks of the cliff. It is somewhat smaller and more uniformly dark than the Common Swift which is so abundant in Europe.

The Osprey has not been as lucky and have disappeared from rocks where not so long ago they settled in their impressive nests. The noisy colonies of the Cory‘s Shearwater are still around, and even a couple of breeding pairs of the Little Shearwater, Bulwer‘s Petrel, but because of the pelagic and nocturnal habits of the latter, its presence is still a mystery.

When they come to the coast at night in search of their nests and their mates, all of these sea birds sing incredible, almost supernatural noises.

Cory‘s Shearwater, the most common seabird in the Canaries apart from the Seagulls, reaches the Canary Islands in mid-February or early March to nest. Egg-laying and hatching takes place in May and June in burrows or „huras“ located under the rocks, compacted in sand or among dense undergrowth. Chicks remain there until the second half of October. Traditionally they were heavily persecuted by the population mainly for the fat that they accumulated and were captured in large quantities. This „aceite de Pardela“ was used to treat respiratory diseases and the birds were also used directly as food. Some poaching of these birds still takes place, although they are now protected by law.

On the other hand, the environmental authorities and environmental groups organized the collection of chicks which were left blinded by the street lights in the coastal towns, organizing school trips to later release them. In this way, it helps a species that apart from poaching, also suffers from the increasing human occupation of the coast.

In November, the Shearwater leave Canarian waters and disperse across the Atlantic, reaching the coast of Brazil and Namibia. They are tireless

Cory`s Shearwater



travellers whose elegantly gliding flight, with their wingtips always skimming the waves and are a well-known image to fisherman and sailors. Their mournful sounds that can be heard around their breeding ground is also part of the extraordinary landscape of Ajuy.

Meanwhile, the woods of Canary Tamarisk in the ravine are home to several species of birds that prefer this habitat to any other. The Sardinian Warbler, an insectivore, which is grey with a white throat and has a red ring around its eye, and the Common Turtle Dove, are more scarce and elusive than the abundant Turkish Dove which can be seen in any city and town.

The Warbler is here all year round, but the Common Turtle Dove migrates to Africa after breeding, leaving very few in Fuerteventura during the winter. The Canary Stonechat inhabits the rocky slopes of the ravines covered in bushes, while the Berthelot's Pipit and Trumpeter Finch are as common in Ajuy as in many other parts of the island.

Collard



Ancestral ocean beings

Immersed in marine sediments of the basal complex in some places, you can find fossils of various sea animals, including echinoderms (sea urchins and starfish), mollusk shells, foraminifera and some ammonites, which are very rare in the Canary Islands. These cephalopods with spiral shells, very distant relatives of today's octopus and squid, evolved into numerous species that lived in the seas around the end of the Cretaceous period about 65 million years ago.

In many places, ammonite fossils are indicators that help determine the age of the rocks in which they are found.

Fossil of a mollusk with a spiral shell







Egyptian Sage



Canary Tamarisk



and his flowers



Creeping Saltbush



Ward`s Weed



Musky Bugleweed



Blond Plantain



Marguerite-Leaved Ragwort



Narrow-Leaved Desert-Nettle



Cádiz -Navelwort

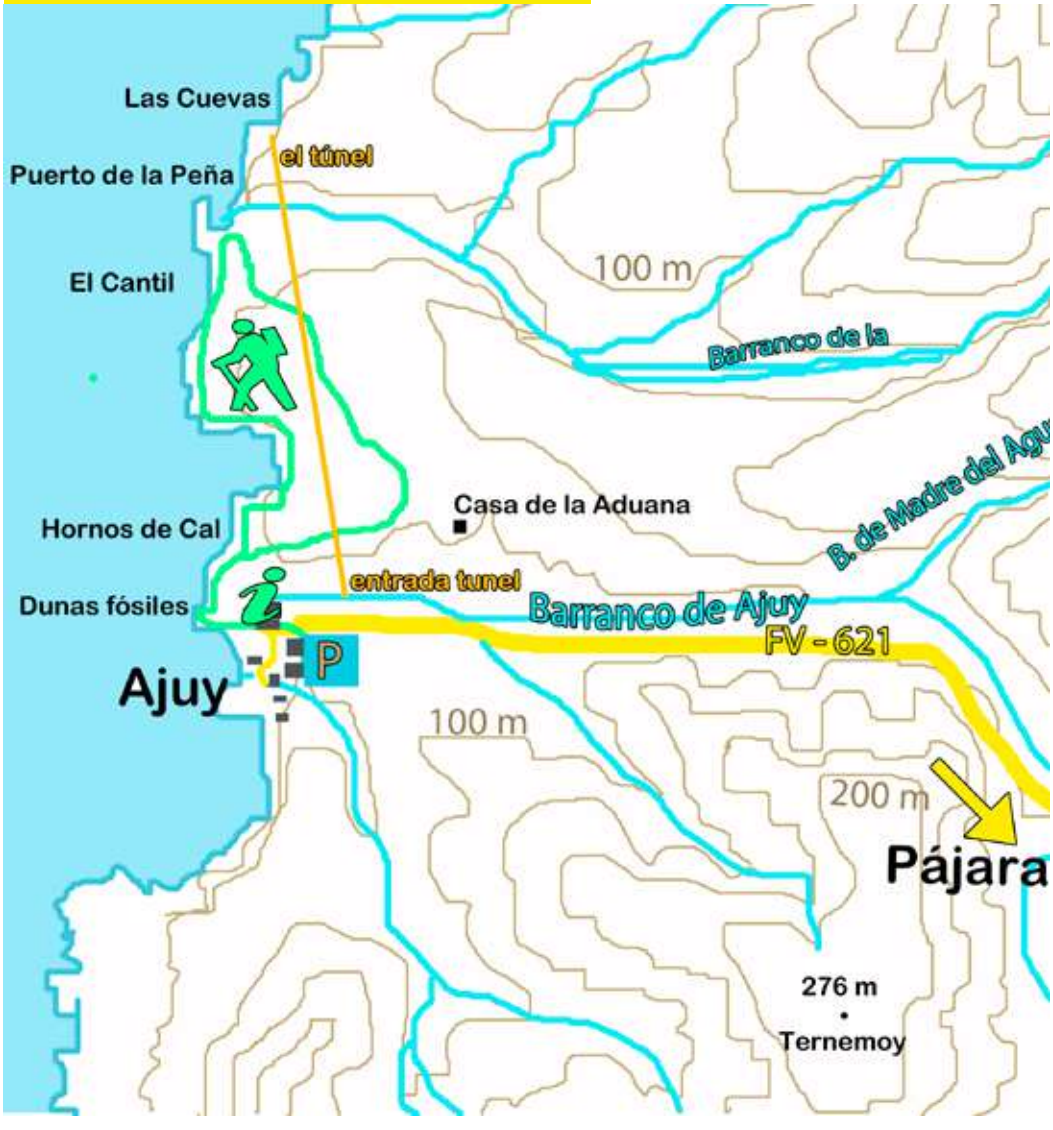


Brown Seaheath

Recommended Route: Puerto de la Peña - Ajuy

Distance: 2 kilometres.
Time: 2 hours – round trip.
Level of difficulty: Easy.

Recommendations and warnings:
It is very dangerous to get too close to the cliff edge. Also pay close attention when walking down into the caves. Due to their close proximity to the sea the steps can get wet and become very slippery.



Description:

At the end of the black sandy beach (200 meters long and 50 meters wide), on the right bank of the mouth of the gorge there is a vertical rock wall with light and dark stripes. They are sediments from the seabed formed 170 million years ago at the time of the dinosaurs. It has alternating layers of shale, siltstone and sandstone, but its current appearance of nearly horizontal layers is not the original, because in reality they have been turned over 180 degrees.

How can we know this? Very simply. If we consider the dark, clay layers are heavier than the white, sandy ones, the latter will settle more quickly on the bottom, while the former will do so more slowly, accumulating on top of the sand. But here they are reversed. The fact that the dark layers are present at the top rather than at the bottom is evidence of an enormous upheaval that literally turned the rocks „upside down". An extensive network of vertical basaltic and trachytic dikes cuts through the sedimentary layers meeting an equally large set of fractures and faults.

On top of these older layers of sediments sits a raised beach, at no less than 14 meters above sea level. This does not however mean that the sea level was once that high and then suddenly dropped drastically to today's level. Although it did drop, this also clearly shows that the island has risen due to orogenic movements, pushing up materials from ancient marine deposits, sand and pebbles accumulated by waves 4.8 million years ago. At the same height, but further into the ravine of Ajuy, we can see a formation of basaltic lavas. It is the river of lava created by the eruption of Morro Valdés, which, even though it was 9 kilometers away, still managed to reach the sea. We know this from its ´pillow´ form, a sign that the lava reached the beach and rapidly cooled when it came into direct contact with the water.

However, there are many more pages in the amazing geology book which is Ajuy. On top of the old raised beach and the lava, a field of sand dunes was formed millions of years later which also came from the sea. It has now been converted into fragile calcarenite where unfortunately, more than one imbecile has left their senseless mark. It relates to a cold time, when the increase in polar ice caused a drop in the sea level, exposing white sand formed by fragments of shells, shellfish and seaweed, which the wind blew inland. Geologists have identified up to four strips of consolidated dunes in the upper section. They are separated by thin alluvial marine deposits (conglomerates and sandstones) with fossils from almost five million years ago, showing alternating periods of dry and wet climates.







The artistic church of Nuestra Señora de la Regla is shaded by large Indian laurels.

Pájara and its neighborhoods

The capital city of the same name is located in a valley in the mountainous region known as the Massif of Betancuria, most of which is protected as a Rural Park. You get to the village by the FV-30 (Tuineje-Betancuria). Coming from Betancuria, the very twisty road is accompanied by spectacular mountain scenery and between Tuineje and Pájara it is bordered by farmland. It´s on the FV-605, 1.5 km after the junction with the FV-621, which leads to the coastal town of Ajuy.



The town of Pájara is a small oasis in the arid landscape

The secret of bare mountains

The town of Pájara is located in one of the most spectacular geological landscapes in the Canary Islands. Here, the whitish hills of the Massif of Betancuria, hide the mystery of the origin of the Archipelago and give clues to understanding its birth about 20 million years ago. However, materials that are found here are much older, formed in the depths of the ocean and full of mysteries.

Basalts, rocks which are very common in the landscape of Fuerteventura, are the product of ´primary´ basaltic magmas that solidified on the surface. But when this magma solidifies at great depths without reaching the surface, it forms a type of rock called ´gabbro´, which contains various different types of coarse crystals.

However, magma flow towards the surface is not constant. It often stays for periods in a type of intermediate tank enshrined in the earth‘s crust called „magma chambers“ which are located beneath a volcano or a group of volcanoes.

As time progresses, the primary magma originally contained in these chambers slowly cools and begins to undergo physical and chemical changes, especially fractional crystallization of different components. This causes „differentiated“ magmas, generally more viscous, and which can be emitted by the volcano during later eruption cycles, after a period of inactivity. Among the rocks that produce these magmas on cooling are rhyolites, trachytes and phonolites, all with a much lighter colour than the basalt.



A restored water wheel in front of the Town Hall

Living off the land

Oblivious to the relentless growth of its tourist resorts, the historic-artistic centre of the town of Pájara boasts to be the most cared for and beautiful town in all of the municipality; the capsule of a time not so long ago but definitely forgotten.

This is a place which was not only passionately defended by Miguel de Unamuno during his months of exile here in Fuerteventura, but which bears no relevance to the popular saying that „en Pájara, no hay pájaros (there aren´t any birds)." Upon arrival in the village, a cheerful bustle of Moorish Sparrows and Collared Doves welcomes travellers to an amazing environment. The surrounding parched land gives way here to a lush garden, the most beautiful in Fuerteventura, dominated by lush Indian laurels, Chinese Roses and colorful Bougainvillea. This is a recently created landscape and is one whose survival is not only guaranteed with a regular supply of water from desalination plants, as all the plants here are exotic, but which ultimately has an important cultural and touristic significance. And it's beautiful.

Less spectacular but more culturally important are the now dormant crop fields adjacent to the town of Pájara and its neighbourhood. They are testimony to the intelligence of the Majoreros and their victorious struggle against the desert. These little areas of land surrounded by modest earthen walls are called ´gavias´ and are distributed throughout much of Fuerteventura. They are an original agricultural system unique in arid areas where runoff water is used, taken from water collectors and carried through ´recogederos´ or pipes and stored in the same place as the crops. They are actually plots of land converted into temporary water dams and are enclosed on all sides with walls or ridges of earth called „trastones". These have a lock used to let in or stop the water. Interconnected by an ingenious stepped structure and connected with breaches, the overflow from one allows the next one to be filled or drained when it reaches a certain level thanks to weirs which prevent the trastones from collapsing. In this way the rain water, which falls heavily and is laden with nutrients, is caught in the field, where due to the clay soil it slowly seeps in. This is popularly known as „drinking".

The invention is not a Majorero one, but it's as if it was. It is of North African origin, probably brought over by the numerous Moorish slaves who arrived in force to this land in the sixteenth and seventeenth centuries. Cultivation is focused on cereals and dryland legumes as growing



Growing potatoes in a ´gavia`

plants don´t receive any additional water than that which comes from the rain. This intelligent management eventually ensured the survival of Muslims and Christians.

Along the edges of some gavias and the surrounding hillsides there are often traditional fruits such as figs, mulberries, carob trees, pomegranates and almonds. Although today they are almost forgotten, gavias still maintain the biological productivity of the area through the use of the soil and water. They therefore contribute to the conservation of biodiversity and the prevention of erosion and stand up to the advancing desert. In recent decades, some have been converted for the cultivation of potatoes and vegetables that require little irrigation. When these gavias are aligned longitudinally and only occupy the bottom of the ravines they are called „nateros“.

Some of the old`nateros`near Toto





Well cared-for `gavias` near Toto can hold the running rainwater

Another traditional farming system is the ´chain´ or ´terraces´. This terracing is found in areas with steep slopes held up by dry stone walls or embankment. The development of this type of staggered construction is directly related to the lack of flat land for cultivation, a situation which was aggravated in Fuerteventura by the limitations of the soil. They are closely linked to periods of high population density and scarce resources such as those recorded in the first half of the twentieth century, which forced the Majoreros to restart the production of new terraces which, in other times, were discarded because of their low profitability. Construction and maintenance required a lot of manpower to achieve meager crops, so they were the first to be abandoned once the economic and social conditions of the island improved.

A unique element of this ´agroscape´ is the American Windmill. Its origin is relatively recent and it was introduced in the early twentieth century. With the wind as an ally, it allowed the replacement of traditional wells, which were moved by donkeys or camels.

This favoured the extraction of water from wells for irrigation of crops such as alfalfa, potatoes and tomatoes, some of which are indigenous varieties like the small and exquisite „huevo de gallo“.

Now in the XXI century many of these mills are still in use and bear the name which in 1888 was the first trademark in the world: The Aeromotor Chicago. By 1960 there were about 500 wells with these windmills, 184 of which are still in use today, mostly in the center of Fuerteventura (Tuineje and Antigua). However, the installation of diesel engines and over-exploitation of aquifers, which are responsible for an excess of salt in the water, more than 10 grams per liter, is condemning these beautiful examples of agricultural archaeology to ruin.



A Chicago windmill in action

Wonderful trees that exude milk

On the steep stony slopes next to Pájara small patches of spurges can still be seen, reduced in size due to livestock and their use as firewood once dried. Two species are found on the mountains: Balsam-Spurges who mostly occupy the sunny, south and west facing slopes, while the King-Juba-Spurges grow mainly on the shady slopes facing north.

Not only is it surprising that such a fragile plant manages to make progress in such an arid land like this, but even more so that it ´bleeds´ a white milk from its broken branches. Miguel de Unamuno from the Basque country in mainland Spain drew attention to this. He poetically said that this milk „acrid and caustic" is nothing more nor less than „the juice from the charred bones of the volcanic earth that emerged from the bottom of the sea; the marrow of the bones of this parched land".

What is the difference between King-Juba-Spurges and Balsam-Spurges? The first has a thinner and straighter, grey trunk very few branches except at the top. The leaves are long and narrow, and are a deep green. But the most important feature is that each small branch carries several inflorescences at its apex, each on stems of 4-5cm in length that depart radially from the apex of the branch. When in fruit, every twig holds several fruitful capsules. The Balsam-Spurges however, especially the older ones, have much thicker trunks and branches that come out irregularly from below, tortuous and brown. Its leaves are a greyish green and shortly elliptic. In general they are only half the length of those of the King-Juba-Spurge. Each small branch ends in only one inflorescence on a short thick stalk, so that during fruiting a single capsule is found at the end of each branch. The King-Juba-Spurge also has both male and female flowers on each individual and therefore fruit and seeds, whereas on the Balsam-Spurge, the flowers of both sexes are found on separate individuals. It is a dioecious species and only the female specimens produce fruit.

The spurges are not alone. Further up at the top of the shady slopes, isolated examples of Canary Olive Trees can be found looking like dark green rounded spots. Don´t be fooled by its appearance as an expanding newcomer. It's actually just the opposite. They are the last survivors of a native forest which 2,000 years ago covered much of the Majorero mountains, called thermophilous forest and now almost extinct.

A thermophianary forest, now extinct. It was typical of those areas of the Canaries with a Mediterranean climate, situated between 200 and 400 meters and composed of Wild Olives, Mastics trees, Canary Juniper and Canary Palms, but they quickly perished under the axe and the gnawing of the goats. The expansion of some crops is also to blame as the terraces or ´chains´ clung to the slopes in a meagre attempt to increase grain harvest and keep away hunger.



An example of a Balsam-Spurge centennial near Toto

A Spurge dulce damaged by goats

The joy of the Blue Tits



Gardens of Pájara

Blue Tit



The gardens of Pájara and the vegetated slopes around the village are a good place to observe Blue Tits. The Blue Tits of Fuerteventura, called “Alegría” (“Joy”) by its inhabitants, are one of the five subspecies of this bird that inhabit the Canary Islands. The subspecies or race from the eastern islands is comparatively rare and can also be found on Lanzarote. Exactly as the famous finches of the Galapagos Islands, studied by Charles Darwin, the Blue Tits of the Eastern Canaries have evolved from ancestors which must have reached the islands some million years ago from the continent.

The evolutionary history of this little bird is fascinating and was only very recently unveiled by scientists, in 2015 and thanks to modern techniques of molecular genetics, after having rejected some other contradictory theories. In these studies, three million nucleotides were analysed. The as far most accepted theory, that the Blue Tits had back-colonised northern Africa coming from the Canary Islands, was proved to be wrong. Instead, the results showed that the Blue Tits reached the Canaries in three independent immigrant waves: the first one took them to La Palma; in the second wave they reached the central Canaries and El Hierro. Finally, during the last immigrant wave, the birds colonized Lanzarote and Fuerteventura, coming again from North Africa. For this reason, the Blue Tits of the Eastern Canary Islands are genetically more close to the North African ones as to those from the other islands of the archipelago.

This is a rare and fascinating example of evolution by adaptative radiation in small “jumps”, in a bird that on the continent typically inhabits forested areas, but which managed to adapt and survive in a desert-like biotope.

Other common birds in cultivated areas are the Hoopoe, known here as the “Tabobo”, the Spanish Sparrow, which is often called the „well“ bird because they regularly breed in the stone walls in the interior of wells, and the Linnets. At night, the Barn Owl flies over the fields hunting for small rodents and perhaps even a Canarian Shrew, exclusive to the Eastern islands.

Small invaders

Across all of Pájara, but especially in places where tourists stop, it is easy to see a Barbary Ground Squirrel, a small invasive newcomer to the island who has made himself quite at home. The four black and two white stripes which run down the full length of its body and tail make it is easy to identify.

The species originally comes from the northwest corner of Africa and can be found in Morocco, High and Middle Atlas mountains, from the south of Agadir to the north of the Sahara and to the northwest of Algeria. In Spain they live only in Fuerteventura, but they didn´t come here naturally. They were brought here by boat and plane in 1965 from the former Spanish colony Sidi Ifni, with the help of some of the Majorero settlers who went there to earn a living and then returned with these curious animals as pets. Its escape into the wilderness in an arid environment like that of Morocco explains the success of its forced colonization.

Ground squirrels are not related to European tree squirrels. Reproduction begins in February, when you can hear the peculiar, shrill of the singing males („chic-chic-chic -...“). Gestation lasts for two weeks and the number of babies ranges from four to nine. At five to six weeks they begin to leave the nest and at seven they are weaned. Between March and April the first youngsters can be seen and between May and June, a third of the females who have already given birth have a second litter. With an island population estimated at more than one million, this explains their success. It also explains their notoriety, because although omnivorous, 75% of their diet is vegetarian with a special preference for crops, to which they can cause serious damage.

On the contrary, their arrival has been a windfall for predators like cats, kestrels, ravens, even vultures, and especially buzzards. The latter, which by 1960 was on the verge of extinction in Fuerteventura, has benefited greatly from the appearance of such an appetizing invader. So much so that they have become its favourite prey, something that has allowed its numbers to grow exponentially to new limits that couldn't have even been imagined a few decades ago.



Finally a tip: never feed the squirrels. However confident and friendly they appear, they are wild animals and can give a nasty bite, transmit diseases or pass on fleas or other unwanted pests.

Simony`s Skink

This reptile, endemic to Fuerteventura and Lanzarote, is sometimes found in cultivated areas. Because of its rarity and because they spend much of their lives under rocks or in underground galleries, it is very difficult to see. Sometimes you may see one „lisneja“ taking a bath in the sun on a stone, but most likely is that their presence in an area pass virtually unnoticed. It feeds on small invetrebrados, and relatively little is known about their biology and distribution in Fuerteventura.









Cornish Mallow



Spanish Vetchling



Burchard's Caralluma



Scarlet Pimpernel



Canry Island Rockrose



Mediterranean Sow-Thistle



False Spurry



Century Plant



Black Mustard



Prickly Pear and Cochinilla-louse



St.Mary`s Thistle



Canary Island Crooked Flower



Balsam-Spurge



detail



King-Juba-Spurge



detail



Canary Island Candle Plant



detail



Canary Island Lavender



Pinnatrifid-Leaved Poppy



Figwort



Crown Daisy



Pastor`s Asparagus



Hare Barley



Canary Island Stonechat



Palm Dove



Great Reed Warbler - Migrant



Linnet



Spanish Sparrow



Canary Island Blue Tit



Black Canarian Cucarrón



„Chinche“ - a bug species



Monarch Butterfly



Striped Earwig



Black Widow



Betancuria-Mantis

Recommended Route: Toto - Valle de Terequey

Level of Dificulty: medium
Elöevation difference: aprox. 110 m
Distance: 5 km
Time: 2,5 h (roundtrip)



Description:

The route begins in the village of Toto at its chapel dedicated to San Antonio de Padua, at the bottom of the steep hill that is the main street. It is a simple construction from the eighteenth century where an image of the patron saint is worshipped by unmarried girls who pull at her lace habit in an attempt to find a boyfriend.

From the open square to one side there is a unique view of the fields arround Pájara. It's dotted with Canarian Palms, with its white washed village clustered at the end of a valley capriciously compartmentalized by ´gavias´ and ´nateros´, whose walls retain the valuable fertile land for agricultural use. In contrast are the stark hillsides on both sides, where the ruined walls of the old terraces are observed.

These abandoned fields, now obsolete, are part of the „architecture of hunger" where grains were introduced in this thankless land in a time of need not so long ago.

In the background you can see the rounded hills typical to this part of the island and the distant blue sea. In winter and spring scattered spurges give splashes of green color to these earthy slopes.

Our route is part of the island's network of trails and is clearly marked and in good condition. Having reached the bottom of the ravine, we are greeted with the characteristic figure of an American windmill, beside which are growing centenarians of Balsam-Spurge. Surrounded by a livestock enclosure, the damage caused by the goats is more than evident and responsible for their odd shapes. Despite the caustic white sap that the plant exudes, the animals are still able to nibble its leaves and branches, leaving them naked as far as they can reach. The fragility of the branches causes numerous breaks, so much so that the animals can break the plant, resulting in these extraordinary specimens.

Follow the marked path. The intense agricultural use of the valley explains the many gavias and fruit trees which are found here. But all this fertile land is now as ruined as the traditional agriculture. Abandonment is killing the very trees that were planted by our ancestors, that were accustomed to being taken looked after in a way



Chapel of Toto

Small shelter on the way





The Carob Tree

His robust trunk is quite a surprising sculpture chiseled by nature. However, and although it looks so tough, remember that it is a being several hundred years and, as such, extremely fragile. Do not climb the trunk or roots.
A treetment of poorly educated visiters could finish it in a short.
Let us save this heritage for our grandchildren.



that they haven't been for decades. But at least the joy of the Blue Tits still remains. A name given to these little blue birds in Fuerteventura whose singing uplifts all those who listen to it.

The spurges return to join us next to a new picnic area, just as the trail begins to climb the cliff path. Slightly off our trail, about 10m away, it's well worth a detour to admire an old female Carob Tree sleeping at the bottom of the ravine for more than two centuries.

Back on the path you discover other interesting plants such as Canary Island Crooked Flower, Silky Golden Star, asparagus and Arabian Scurfpea. Also small birds like the confident Tarabilla canaria, easy to spot as it is always attentive to any insect that appears on top of the plants and stones. The Spectacled Warbler is exactly the opposite, scared and so stays permanently hidden inside the bushes where it finds shelter and food. Above our heads the buzzards screams tireless in the defense of its territory. Egyptian Vultures also often pass by here, their former nesting ground and whose presence is remembered in the name of the nearby village Valle de Guirre.

If you look at the map it indicates that you are going up the valley of Tequereyde, but if ask any resident here they will point out of error of the cartographer. Its real name is Terequey, a beautiful clear prehispanic name. Smooth walls highlight the hillsides of Risco Blanco and the Riscos del Carnicero where, from the summit the spurges descends to meet the abandoned terraced fields. On top of them, a tight line of Agaves can be seen as a sort of an armored border, which marked the boundary between livestock and land. Reinforcing these defences, every stone wall was in turn fortified by lines of prickly cactus, which in addition to defending the meager crops of cereals from the teeth of voracious goats, it also allowed the cultivation of Cochinille Louse. And above the terraces, a few scattered olive trees dot the hillsides in a difficult attempt to regain their former space of lost forests.

At the top the view is amazing. Towards Vega del Rio Palmas the stretch of whitish rounded mountains remind us of the well-known granite landscapes of the peninsular such as the Sierra de Madrid and Extremadura. But it's a mistake: The rocks of Fuerteventura have little to do with granite, despite their appearance. If you remember back to classes of Natural Science, granite is a plutonic rock consisting of three elements, quartz, feldspar and mica. The rock here is Syenite which is also plutonic and has feldspar in his structure, but is

devoid of quartz. That's the difference, subtle but important.

It's possible to follow the path until you reach the road linking Pájara to Betancuria (about 20 minutes), where you could pick up a previously parked vehicle to return to Toto, or walk down the valley to the dam of Las Peñita.



Impressions of the route



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Thanks for the fotos to:

PEDRO OROMÍ MASOLIVER: pág. 33; 39 arriba dcha., centro izq. y dcha., abajo izq. y dcha.; 57 arriba dcha., centro izq., abajo izq. y abajo dcha.; 89 abajo dcha.; 119 arriba izq.; 142 todas; 179 todas.

MIGUEL PEÑA ESTÉVEZ: pág. 72 (guincho); 83; 89 arriba dcha., centro izq.;132; 140 arriba dcha., centro izq., abajo izq.; 156; 178 centro izq.

JUAN RAMÍREZ ROMÁN: pág. 39 arriba izq.; 67; 70; 71; 72 (aguja colipinta); 134 abajo; 178 arriba izq., centro izq. y abajo izq.

JUAN JOSÉ RAMOS MELO: pág. 89 abajo izq.; 119 arriba dcha., centro izq.; 133 arriba; 134 arriba izq.

MARÍA ANTONIA PERERA BETANCORT: pág. 12; 13; 14; 15.

LIDIA SOTO MARTÍN: 165; 166; 167.

MARTÍN LECHNER: pág. 31; 71 abajo; 84 arriba; 133 abajo; 178 arriba izq.

FRANCIS VILIC: pág. 47; 117.

HERIBERTO LÓPEZ HERNÁNDEZ: pág. 53 (cigarrón palo majorero).

JUAN JOSÉ BACALLADO ARÁNEGA: pág. 179 centro izq.

DOMINGO TRUJILLO GONZÁLEZ: pág. 117.

MIGUEL IBÁÑEZ GENIS: pág. 53 (Canariela majorera)

The other fotos are from the authors or Sabine Kiesewein.

Appendix

The following pages contain the common names of the quotet plants and animals in english and spanish and also in relation to their scientific meaning.

Plants

Common names	Spanish Names	Scientific names
Aegyptian Sage	conservilla	Salvia aegyptiaca
Alkali Seepweed	matomoro común	Suaeda vera
Arabian Scurfpea	tedera	Bituminaria bituminosa
Artichoke Thistle	alcachofa silvestre	Cynara cardunculus
Balsam-Spurge	tabaiba dulce	Euphorbia balsamifera
Bethencourt‘s Aichryson	gongarillo majorero	Aichryson tortuosum var. Bethencourt.
Black Mustard	mostaza negra	Brassica nigra
Black Saltwort	matabrusca negra	Salsola divaricata
Bladder-Dock	vinagrerilla roja	Rumex vesicarius
Blond Plantain	llantén lanudo	Plantago ovata
Bolle‘s Ragwort	moqueguirre de Bolle	Senecio bollei
Bolle‘s Sea-stock	alhelí canario	Matthiola bolleana
Bourgeau‘s Thistle	cardo majorero	Carduus bourgeaui
Boxthorn	espino del mar	Lycium intricatum
Brown Seaheath	tomillo marino pardo	Frankenia capitata
Burchard‘s Caralluma	cuernúa	Caralluma burchardii
Burchard‘s Fleabane	pulicaria majorera	Pulicaria burchardii
Cádiz-Navelwort	sombrerillo común	Umbilicus gaditanus
Canary Island Bully Tree	marmolán	Sideroxylon canariense
Canary Island Cactus-Spurge	cardón canario	Euphorbia canariensis
Canary Island Candle Plant	verode	Kleinia neriifolia
Canary Island Crooked Flower	romero marino	Campylanthus salsoloides
Canary Island Date Palm	palmera canaria	Phoenix canariensis
Canary Island Deersfoot ern	helecho batatilla	Davallia canariensis
Canary Island Dog-Mustard	relinchón canario	Erucastrum canariense
Canary Island Lavender	matorrisco común	Lavandula canariensis
Canary Island Maytenus	peralillo	Maytenus canariensis
Canary Island Olive tree	acebuche	Olea cerasiformis
Canary Island Rockrose	jarilla turmera	Helianthemum canariense
Canary Island Tamarisk	tarajal canario	Tamarix canariensis
Catalina‘s Restharrow	taboire de Catalina	Ononis catalinae
Century Plant	pitera común	Agave americana
Chios-Storksbill	alfilerillo común	Erodium chium
Christ's Restharrow	taboire de Jandía	Ononis christii
Climbing Asparagus	esparraguerra común	Asparagus umbellatus
common Needle-Wort	yesquerilla fina	Ifloga spicata
Common Reed	carrizo	Phragmites australis
Cornish Mallow	malva bastarda	Lavatera cretica
Creeping Saltbush	amuelle de fruto rojo	Atriplex semibaccata
Cretan Fagonia	espinosillo	Fagonia cretica
Crown Daisy	pajito común	Glebionis coronaria
Cutandia-Grass	cután dicotómico	Cutandia dichotoma

Plants

Common names	Spanish Names	Scientific names
Cutleaved Storksbill	alfilerillo picado	Erodium laciniatum
Desert Heliotrope	camellera	Heliotropium bacciferum
Desert Truffle	papa cría	Terfezia claveryi
Desfontaine‘s Seagrape	uva de mar común	Tetraena fontanesii
Dwarf Oatgrass	cañotilla enana	Rostraria pumila
Eastern Canaries Climbing Asparagus	esparraguera majorera	Asparagus nesiotes subsp. purpuriensis
Elmleaf Blackberry	zarza común	Rubus ulmifolius
European Searocket	rábano marino	Cakile maritima
False Spurry	esparcilla falsa	Spergula fallax
Famara Viper‘s Bugloss	taginaste blanco oriental	Echium famarae
Famara-Reichardia	cerraja de Famara	Reichardia famarae
Felty Saltbush	algahuera	Chenoleoides tomentosa
Field-Marigold	alpoadera	Calendula arvensis
Figwort	fistulera común	Scrophularia arguta
Fuerteventura-Sage	conservilla majorera	Salvia herbanica
Glaucous Glasswort	sapillo	Arthrocnemum macrostachyum
Graciosa-Broomrape	jopo de La Graciosa	Orobanche gratiosae
Halfmoon Saltbush	amuelle medialuna	Atriplex semilunaris
Hare Barley	cebadilla ratonera	Hordeum murinum subsp. leporinum
Heberdenia	aderno	Heberdenia excelsa
Herbaceous Seepweed	matomoro baboso	Suaeda spicata
Hercules‘ Mace	mazo de Hércules	Phellorinia herculeana
Horned Hedge-Mustard	patagallina	Notoceras bicorne
Ifni-seepweed	matomoro moruno	Suaeda ifniensis
Jandía Viper‘s Bugloss	taginaste de Jandía	Echium handiense
Jandía-Marguerite	margarita de Winter	Argyranthemum winteri
Jandía-Spurge	cardón de Jandia	Euphorbia handiensis
Kikuyo-Grass	kikuyo; hierba kikuyo	Kikuyiuochloa clandestina
King-Juba-Spurge	tabaiba salvaje	Euphorbia regis-jubae
Knot-flowered Ice-Plant	cosco	Mesembryanthemum nodiflorum
Lanzarote Bird‘s-Foot Trefoil	corazoncillo de Lanzarote	Lotus lancerottensis
Lax-Flowered Monanthes	pelotilla escamosa	Monanthes laxiflora
Leafless Spurge	tolda	Euphorbia aphylla
Macaronseian Polypody	polipodio del país	Polypodium macaronesicum
Marguerite-Leaved Ragwort	moqueguirre hediondo	Senecio leucanthemifolius
Mariout-Milkvetch	chabusquillo de Jandía	Astragalus mareoticus
Mastic Tree	lentisco	Pistacia lentiscus
Mediterranean Saltbush	amuelle grande	Atriplex halimus
Mediterranean Saltwort	matabrusca carambilla	Salsola vermiculata
Mediterranean Sow-Thistle	cerrajilla común	Sonchus tenerrimus
Medusa‘s Head Bindweed	chaparro canario	Convolvulus caput-medusae
Mocan	mocán	Visnea mocanera
Moorish Seagrape	uva de mar moruna	Tetraena gaetula
Moquin‘s Saltbush	balancón	Traganum moquinii

Plants

Common names	Spanish names	Scientific names
Mount Atlas Mastix-Tree	almácigo	Pistacia atlantica
Mountain Fumitory	mellorina macaronésica	Fumaria montana
Musky Bugleweed	hierba crin	Ajuga iva
Narrow-Leaved Desert-Nettle	ratonera picona	Forsskaolea angustifolia
Oed Massa Ragwort	moqueguirre de Oued Massa	Senecio massaicus
Parabolic Rye-Grass	ballico moruno	Lolium parabolicum
Pastor's Asparagus	esparraguera espinablanca	Asparagus pastorianus
Pinnate-Leaved Sow-Thistle	cerrajón de risco	Sonchus pinnatifidus
Pinnatifid-Leaved Andryala	estornudera común	Andryala pinnatifida
Pinnatifid-Leaved Poppy	amapola fina	Papaver pinnatifidus
Prickly Pear Cactus	tunera común	Opuntia maxima
Purslane-Leaved Aizoon	patilla	Aizoon canariense
Scarlet Pimpernel	muraje común	Anagallis arvensis
Sea Purslane	verdolaga litoral	Sesuvium portucacastrum
Sea Spurge	lechetrezna de playa	Euphorbia paralias
Selvagen's Snapdragon	conejito de Salvajes	Misopates salvagense
Shrubby Madder	tasaigo	Rubia fruticosa
Shrubby Sea-Lavender	salitrosa	Limoniastrum monopetalum
Silky Golden Star	jorao	Asteriscus sericeus
Small Hare's Ear	hierba negrilla	Bupleurum semicompositum
Smallseeded Mairetis	alancranillo azul	Mairetis microsperma
Smooth Periploca	cornical	Periploca laevigata
Snowy Small Saltbushs	saladillo blanco común	Polycarpaea nivea
Soft Seepweed	matomoro brusquillo	Suaeda mollis
Spanish Vetchling	chícharo morado	Lathyrus clymenum
Spiny Lettuce	aulaga	Launaea arborescens
Spiny Lettuce' s Dodder	greña de aulaga	Cuscuta approximata
St. Mary's Thistle	cardo mariano	Silybum marianum
Staining Lichen	orchilla	Roccella canariensis, R. tuberculata
Sticky Fleabane	altabaca	Dittrichia viscosa
Sventenius' Sea-Kale	colino majorero	Crambe sventenii
Tamonante's Oatgrass	avenera de Tamonante	Trisetum tamonanteae
Tenflowered Coast-Bush	matocosta milengrana	Gymnocarpos decandrus
Theurkauff's Ice-Plant	cosco de Jandía	Mesembryanthemum theurkauffii
Thickstemmed Aichryson	gongarillo mayor de Jandía	Aichryson pachycaulon subsp. pachycaulon
Thorny-fruited Small Saltwort	saladillo pinchudo	Gymnocarpos sclerocephalus
Tree-Asparagus	esparragón	Asparagus arborescens
Ward's Weed	cucharilla	Carrichtera annua
Webb's Sandwort	morujón fino	Minuartia webbii
Western Bellflower	campanita canaria	Campanula occidentalis
Western Restharrow	taboire de arenas	Ononis hesperia
Wild Tantan	tantán salvaje	Desmanthus virgatus
Willow-Leaved Carline-Thistle	cardo de Cristo	Carlina salicifolia
Yellow Cistanche	jopo amarillo	Cistanche phelipaea

Animals

Common names	Spanish names	Scientific names
Egyptian Vulture	guirre	Neophron percnopterus majorensis
Araña de Pinzas	araña de pinzas	Palpimanus canariensis
Araña Mosana	araña masona	Titanidiops canariensis
Arminda Majorera	arminda majorera	Arminda fuerteventurae
Atlantic Lizard	lagarto de Fuerteventura	Gallotia atlantica mahoratae
Bar-tailed Godwit	aguja colipinta	Limosa lapponica
Barbary Falcon	halcón tagarote	Falco pelegrinoides
Barbary Ground Squirrel	ardilla moruna	Atlantoxerus getulus
Barbary Partridge	perdiz moruna	Alectoris barbara koenigi
Bardino	bardino	Canis familiaris
Barn Owl	lechuza majorera	Tyto alba gracilirostris
Barred Warbler	curruca mirlona	Sylvia nisoria
Berthelot's Pipit	caminero	Anthus berthelotii
Betancuria-Mantis	teresita majorera	Pseudoyersinia betancuriae
Black Widow	viuda negra	Latrodectus trecemguttatus
Black-Bellied Sandgrouse	ganga	Pterocles orientalis
Blue Tit	herrerillo majorero	Parus caeruleus degener
Bulwer's Petrel	perrito	Bulweria bulwerii
Buzzard	aguililla canaria	Buteo buteo insularum
Calato Gonzalez	calato de González	Calathus gonzalezii
Campalita de Oliver	campalita de Olivier	Campalita olivieri
Canariela Majorera	canariela majorera	Canariella eutropis
Canary Island Camel-Spider	solífugo canario	Eusimonia wunderlichi
Canary Islands Oystercatcher	ostrero canario	Haematopus maedewaldoi
Canary Islands Quail	codorniz canaria	Coturnix gomerae
Canary Islands Scorpion-Spider	araña garrapato gigante	Platyoides venturus
Canary Islands Stonechat	caldereta	Saxicola dacotiae dacotiae
Chinche	chinche asesina	Coranus griseus
Cigaròn Palo Majorero	cigarrón palo majorero	Purpuraria erna erna
Cochinita Arena	cochinita de las arenas	Porcellio spinipes
Common Raven	cuervo canario	Corvus corax canariensis
Cory's Shearwater	pardela cenicienta	Calonectris diomedea borealis
Cream-Colored Courser	engaña	Cursorius cursor
Cucarro Boliche	cucarro boliche ciliado	Arthrodeis subciliatus
Curracón de Arenal	cucarrón de arenal	Scarites buparius
Darkling Beetle	pimelia de erial	Pimelia lutaria
Death's Head Hawk-moth	esfinge de la calavera	Acherontia atropos
Egyptian flower-mantis	zapatana	Blepharopsis mendica
Eurasian Spoonbill	espátula	Platalea leucorodia
European Rabbit	conejo	Oryctolagus cuniculus
Fuerteventura-Limpet	lapa majorera (lapa de sol)	Patella candei
Great Disdera-Spider	disdera gigante	Dysdera longa

Animals

Common names	Spanish names	Scientific names
Great Grey Shrike	alcaudón canario	Lanius meridionalis koenigi
Great Reed Warbler	carricero tordal	Acrocephalus arundinaceus
Grey Crowned Crane	grulla coronada	Balearica regulorum
Hadada Ibis	ibis hadada	Bostrychia hagedash
Hogna Wolf-spider	araña lobo feroz	Hogna ferox
Hoopoe	abubilla	Upupa epops
Horned Mantis	santateresa patapalo	Hypsiocorypha gracilis
Houbara Bustard	avutarda canaria	Chlamydotis undulata fuert.
Jandia Chuchanga	chuchanga de Jandía	Hemicycla paeteliana
Jandia Land-Snail	canariela de Jandía	Canariella jandiaensis
Kanary Islands Shrew	musaraña canaria	Crocidura canariensis
Kentish Plover	chorletijo patinegro	Charadius alexandrinus
Kestrel	cernícalo majorero	Falco tinnunculus dacotiae
Lesser Short-Toed Lark	calandra canaria	Calandrella rufescens rufescens
Linnet	pardillo majorero	Carduelis cannabina harterti
Little Shearwater	tajose	Puffinus assimilis baroli
Mariadominga	mariadominga	Derycoris lobata
Monarch Butterfly	monarca	Danaus plexippus
Monk Parakeet	cotorra argentina	Myiopsitta monachus
North-African Hedgehog	erizo moruno	Atelerix algirus
Osprey	guincho	Pandion halieaetus
Painted Lady	vanesa de cardo	Vanessa cardui
Palm Dove	tórtola senegalesa	Streptopelia senegalensis
Plain Swift	andoriña unicolor	Apus unicolor
Red Admiral	vanesa de arco	Vanessa atalanta
Rock Dove	paloma bravía	Columba livia
Ruddy Turnstone	vuelvepiedras	Arenaria interpres
Sacred Ibis	ibis sagrado	Threskiornis aethiopicus
Sand-Snail	caracol arlequín	Theba sp.
Sanderling	correlimos tridáctilo	Calidris alba
Sardinian Warbler	curruca cabecinegra	Sylvia melanocephala leucogastra
Simony‘s Skink	lisneja	Chalcides simonyi
Spanish Sparrow	gorrión moruno	Passer hispaniolensis
Spectacled Warbler	curruca tomillera	Sylvia conspicillata orbitalis
Stone Curlew	alcaraván majorero	Burrhinus oedicnemus insularum
Striped Earwig	tijereta de culo claro	Labidura riparia
Trumpeter Finch	pájaro moro	Bucanetes githaginea
Yellow-Legged Gull	gaviota patiamarilla	Larus michahellis