FAJÃS DE SÃO JORGE

BIOSPHERE RESERVE NOMINATION FORM

MESSAGE FROM HIS EXCELLENCY THE PRESIDENT OF THE GOVERNMENT OF THE AZORES

In a dispersed territory like the Azores, particularly in the smaller settlements, it is essential to encourage sustainable development since it is the route to economic progress, social cohesion, quality of life, and the preservation of natural heritage.

In good time, the Government of the Azores has set inhabitants of São Jorge the challenge of jointly drawing up an application to UNESCO for the Fajãs de São Jorge to be designated a biosphere reserve.

Right from the start, this process has been a very inclusive one. Indeed, only by being so can it succeed as it is up to individuals, communities and institutions to choose the foundations for their own development. The public authorities are responsible for establishing the conditions required for this development by enhancing knowledge of our existing natural and cultural assets, improving the conservation of these assets and fostering landmark projects that may serve to catalyse the aims of the Man and Biosphere (MAB) programme.

The Fajãs de São Jorge are an example of a balanced but not always peaceful relationship between human beings and nature. As such, they offer clear evidence of perseverance and tenacity and are unique repositories of ways of life, landscapes and biodiversity that must be conserved and enhanced.

The biosphere-reserve designation will confer international renown on São Jorge, placing the island and its *fajãs* in a network comprising over 600 sites around the world. It will also add economic value to the products and services produced there by allowing them to display a UNESCO seal of quality.

It is therefore with enormous pride in the people and heritage of the Azores that we take this step, which will allow the Azores archipelago to progress and become more cohesive.

Vasco Alves Cordeiro

President of the Government of the Azores

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FAJÃS DE SÃO JORGE

BIOSPHERE RESERVE NOMINATION FORM

PART I SUMMARY

PART II DISCRIPTION

PART I
SUMMARY

1. PROPOSED NAME OF THE BIOSPHERE RESERVE

Fajãs de São Jorge Biosphere Reserve, Azores

2. NAME OF THE COUNTRY

Portugal, Autonomous Region of the Azores.

3. FULFILLMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES

3.1. CONSERVATION — CONTRIBUTE TO THE CONSERVATION OF LANDSCAPES, ECOSYSTEMS, SPECIES AND GENETIC VARIATION

In terms of biodiversity, São Jorge Island hosts a significant number of endemic animal and plant species belonging to several groups of organisms such as mammals (1), birds (9), molluscs (25), arthropods (86), vascular plants (56), and bryophytes (3). Most of these species have international, national or local conservation status.

The Biosphere Reserve area comprises two RAMSAR sites: the São Jorge Central Plateau / Pico da Esperança (3PT027) and the Fajãs of Caldeira de Santo Cristo Lagoon and Cubres Lagoon at São Jorge (3PT015). Also, three areas of community interest are included in the Natura 2000 network. These areas are divided into two Special Areas of Conservation (SAC) – Ponta dos Rosais (PTJOR0013), and Northeast Coast and Ponta do Topo (PTJOR0014) – and one Special Protection Area (SPA) – Topo Islet and adjacent coastal area (PTZPE0028). The SACs host 23 habitat types listed in Annex 1 of the Habitats Directive, six of which have been classified as priority habitats.

The island is also home to several migratory bird species, most of which are listed in Annex I of the Birds Directive. For this reason, the majority of São Jorge's protected areas are also classified as Important Bird and Bird Diversity Areas (IBA).

The richness of São Jorge's landscape, natural and cultural heritage led to the creation of the São Jorge Natural Park by the Regional Government of the Azores[1]. This statutory legal protection, which defines several levels of protected areas, promotes the conservation of the island's ecosystems, habitats, and species. The São Jorge Natural Park therefore comprises 24% of the island's surface and includes one Natural Monument, seven Protected Areas for the Management of Habitat/Species, one Landscape Protected Area, and four Protected Areas for the Management of Resources.

The proposed biosphere reserve corresponds to the entire terrestrial area of the island of São Jorge and a surrounding marine area whose outer boundary lies three miles from the coastline. This marine area corresponds to the zone set aside for local fishing, in which the use of long lines of any kind and line fishing from boats measuring over 14 metres are prohibited[2].

The creation of a Biosphere Reserve on São Jorge Island will result in an additional contribution to the protection level afforded to those landscapes, species and ecosystems, which have been recognised as having a significant environmental, geological and cultural importance at the local, regional, national, and even international level.

The classification of São Jorge Island as a Biosphere Reserve would also reinforce the legitimacy of those measures that have been and will be implemented in the context of the island's Natural Park.

Furthermore, a Biosphere Reserve Status will serve to promote the island both nationally and internationally, subsequently increasing the value of local products and demand for the island and tourism activities. Therefore, this classification will make an immense contribution to the development of São Jorge Island and the cohesion of the region.

In addition, it will increase awareness of and concern for the preservation of local ecosystems and result in greater investment in sustainable development, generating gains for the local economy and the island's natural assets, which must obviously be preserved and used in a sustainable manner.

1 Regional Legislative Decree no. 15/2007/A of 25 June established that the protected areas in each island should be integrated within the island's natural park. The São Jorge Natural Park was created by Regional Legislative Decree no. 10/2011/A of 28 March.

2 Ordinance no. 50/2012 of 27 April.

3.2. DEVELOPMENT

FOSTER ECONOMIC AND HUMAN DEVELOPMENT WHICH IS SOCIO-CULTURALLY AND ECOLOGICALLY SUSTAINABLE

The proposed Biosphere Reserve, which corresponds to the whole of the land area of São Jorge Island and an important adjacent marine area, is the outcome of a process that is wholly identified with the sustainable development of the island.

The main economic activities on São Jorge Island are livestock production, farming, tourism, and fishing. All of these activities are closely linked to natural resources, biodiversity, the landscape, and cultural and historical heritage. The proposed Biosphere Reserve will assume the role of bringing together and guiding these activities and the stakeholders involved, promoting consensus in respect of land planning and sustainable use of resources, including the landscape, soils, and coastal and marine areas.

Additionally, the proposed Biosphere Reserve will also play an important role in promoting dialogue and ensuring cohesion and coherence in terms of the jurisdiction and management of each different (national, regional, and local) level of government administration, encouraging all stakeholders to become involved and participate in discussing and experimenting with sustainable-development models for the various present human activities.

Moreover, the proposed biosphere reserve, by means of an inclusive management structure (coordinated by the São Jorge Natural Park in conjunction with a management board comprising the various bodies with responsibilities in the area, in accordance with articles 53 and 54 of Regional Legislative Decree no. 15/2012/A of 2 April) and the implementation of an action plan, in accordance with article 52 of Regional Legislative Decree no. 15/2012/A of 2 April, will make a decisive contribution to defining and promoting common management criteria that are adapted to the various areas (core, buffer and transition) and to the development of a permanent platform for environmental, social and economic partnership.

3.3. LOGISTIC SUPPORT

SUPPORT FOR DEMONSTRATION PROJECTS, ENVIRONMENTAL EDUCATION AND TRAINING, RESEARCH AND MONITORING RELATED TO LOCAL, REGIONAL, NATIONAL AND GLOBAL ISSUES OF CONSERVATION AND SUSTAINABLE DEVELOPMENT

In terms of logistic support, the Fajãs de São Jorge Biosphere Reserve will play an essential role in coordinating existing capacities and ongoing initiatives in various fields, as well as of the forseen research, conservation, training, environmental education activities, the promotion of local traditions, products and services, and environmental monitoring.

There are already various institutions which use São Jorge Island as a development laboratory for activities in the aforementioned fields while benefiting from some existing infrastructures and programmes. These institutions will be able to consolidate their position on São Jorge island and benefit directly from the creation of the Biosphere Reserve. The following are some of the institutions which currently exist on São Jorge Island: The Regional Government, local authorities, the University of the Azores, the São Jorge Natural Park, environmental and interpretation centres, museums, schools, professional training centres, dairy-product co-operatives, a tuna canning factory, private associations etc.

The University of the Azores currently runs several research projects in the field of natural heritage that concern or are carried out on the island of São Jorge:

- A study of the distribution and phylogenetics of the *Cladonia* genus under the umbrella of the "Coevolution of Cladoniaceae and associated fungi" project;
- Capturing and handling wild birds for the purposes of ringing and blood and faeces collection under the umbrella of the "Biogeography of coccidian, haemosporidian and avian pox in Macaronesian passerines" project;
- A study of the diet, communication, population dynamics and productivity of sea birds in colonies on the Azores that also involves monitoring and counting such birds;
- A study of the evolutionary pattern of the species in order to understand mechanisms of dispersal and subsequent differentiation on the islands under the umbrella of the "Phylogeography of *Woodwardia radicans*" project;
- A study to assess the risk that land birds on the Azores will be exposed to Haemosporidian parasites such as avian malaria.

The Government of the Azores is currently undertaking projects to monitor habitats and endemic species on the island of São Jorge, including censuses of pombo-torcaz-dos-Açores (*Columba palumbus azorica*), milhafre (*Buteo buteo rothschildi*), morcego-dos-Açores (*Nyctalus azoreum*) and morcego-da-Madeira (*Pipistrellus maderensis*).

Under the umbrella of the Regional Plan for Environmental Education and Awareness (PRESAA), the government is undertaking various programmes and campaigns on all of the islands, including the following: Eco-Escolas [Eco Schools], Jovens Repórteres para o Ambiente [Young Reporters for the Environment], ECOXXI, Bandeira Azul [Blue Flag], Miosotis Azores, Formar Ambiente na Escola [Environmental Training in Schools], Eco-Freguesia – freguesia limpa [Eco-Parish – Clean Parish], Açores Entre-Mares, SOS Cagarro, Parque Aberto [Open Park] and Parque Escola [Park School].

Where training is concerned, the Government of the Azores has carried out an annual training session under the umbrella of the programme 'Training in the Environment' and has organised the Eco-Schools Seminar, which involves all schools on the Azores.

In 2015, the school competition "A Água que nos Une" [The Water That Unites Us] on the theme of "O Sol que sustenta a vida" [The Sun That Sustains Life] and the sub-themes 'Biosphere Reserve' and 'Azores Geo-Park' was held. Where the former sub-theme is concerned, the competition was extended to schools on the island of São Jorge in view of the fact that this application is being drawn up.

Also worthy of note is the work carried out by the SPEA (Portuguese Society for the Study of Birds) on the census of buzzards on the Azores and the preparatory work and publication of the São Jorge Geosite Charter by the Geoparque Açores association.

In addition to restaging annual or multi-annual campaigns, the Government of the Azores plans to carry out the following actions in 2016:

- Implementing the Birds of the Azores Observation Network, which involves creating interpretive guides for all of the islands, creating an ornithological guide and a code of good practice, organizing a training course aimed at tourism operators and creating a website;
- Equipping São Jorge island with an extension of the Pico Wild Bird Recovery Centre, enabling the São Jorge Natural Park to receive injured wild birds and allowing them to recover and return to their natural environment;
- Carrying out censuses of the pombo-torcaz-dos-Açores (*Columba palumbus azorica*), melro-preto (*Turdus merula azorensis*), pombo-das-rochas (*Columbia lívia atlantis*), rola-turca (*Streptopelia decaocto*) and milhafre (*Buteo buteo rothschildi*);
- Studying the reproductive biology of the pombo-torcaz-dos-Açores (*Columba palumbus azorica*);
- Various actions undertaken to enhance and recover the endemic flora of the island of São Jorge in conjunction with the Faial Botanical Gardens.

In this context, the proposed Biosphere Reserve will operate as a facilitator of knowledge transfer between research and local stakeholders such as schools, farmers and entrepreneurs by including technical and scientific information in training and skill-development activities aimed at both the administration and visitors/tourists.

4. CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE

4.1. ENCOMPASS A MOSAIC OF ECOLOGICAL SYSTEMS REPRESENTATIVE OF MAJOR BIOGEOGRAPHIC REGION(S), INCLUDING A GRADATION OF HUMAN INTERVENTIONS.

São Jorge Island has unique landscape, geological, environmental and cultural assets, including the island's unique biodiversity and habitats. Due to its elongated shape, the island has an extensive coast line, the third longest in the Azores Islands.

Its hilly configuration is the result of the island's rocky cliffs, mainly located on its north side, which create a steeper landscape. Low-lying enclosed valleys exist alongside valleys situated above sea-level on the tops of cliffs, creating magnificent waterfalls. The coastline is occasionally interspersed with flat areas, named *fajãs* (detritic *fajãs* and lavic *fajãs*), which are a distinctive feature of the island. The highlands of the island are extremely windy and humid, with high levels of rainfall and frequent fogs, even during the summer season. In combination with the island's orographic features, this produces a high hydrological potential which sustains large areas of wetlands (high-altitude bogs) of local and regional importance which, due to their unique characteristics, re also of national and international importance.

Ever since humans first settled on the São Jorge Island, it has witnessed changes to its natural environment, mainly due to changes in habitats and the introduction of exotic animal and plant species, aggregate extraction, and the increase in livestock production which represents the main current economic activity of the island.

Nowadays, the island has a highly humanized landscape but still contains a significant percentage of areas with relatively unaltered habitats, mainly in high-altitude inland areas and coastal areas that are difficult to access such as coastal cliffs and islets. It is within these areas that the island's main natural assets are currently located.

The diversity of wetland communities found in the highlands (Central Plateau) is crucial to the hydrological balance of São Jorge Island. Active raised bogs (7110)[3] and bog woodland (91D0) are priority habitats listed in Annex I of the Habitats Directive. Endemic Macaronesian heaths (4050), which are also a priority habitat, are equally well represented and contain a significant number of endemic *taxa* and rare species.

The fact that a significant proportion of the coastal area is difficult to access has limited anthropogenic impact on one of the island's main biological assets: marine birds. Threatened worldwide, these bird species find an important refuge for nesting and resting in São Jorge's coastal cliffs and islets. The proposed Biosphere Reserve represents a particularly important conservation area for populations of sea bird species such as *Calonectris borealis* (cagarro), *Sterna hirundo* (garajau-comum), *Sterna dougallii* (garajau-rosado), and *Hydrobates castro* (painho).

The coastal cliffs are also home to well preserved pockets of natural vegetation containing endemic species that have a high conservation value and are listed in Annexes II and IV of the Habitats Directive, namely *Rumex azoricus* (labaça-das-ilhas), *Ammi trifoliatum* (pé-de-pomba), *Scabiosa nitens*, and *Dracaena draco* (dragoeiro).

All of the flora and fauna elements that occur within the proposed biosphere reserve are representative of ecosystems that are typical of the Azores archipelago and the bio-geographical region of Macaronesia. As in the other Macaronesian archipelagos, they are supplemented by a significant percentage of endemic elements of considerable conservation and scientific value.

3 The numbers next to each habitat correspond to the codes of the habitats listed in the Annexes of the Birds and Habitats Directive.

4.2. BE OF SIGNIFICANCE FOR BIOLOGICAL DIVERSITY CONSERVATION

The Azores Archipelago contains a great diversity of fungi, plants, and animals, totalling 8,074 known *taxa* (species and subspecies).

The terrestrial environment of the Azores is home to 6,489 *taxa*, including 325 non-nesting and potentially nesting bird species in the area. Of the *taxa* known to exist on land in the Azores, 452 are endemic to the archipelago.

The highest number of endemic *taxa* are found among animal species, which comprise 73% of the Azores' terrestrial endemism. The highest number of *taxa* are found among molluscs (snails and slugs), of which there are 49, and arthropods, of which there are 266.

Only one species of fish is endemic to the Azores: *Centrolabrus caeruleus* (bodião).

As far as birds are concerned, there are 13 recorded endemic bird species.

To complete the richness of endemic taxa, the occurrence of two bat species is to be highlighted: *Nyctalus azoreum* (morcego-dos-Açores), the only mammal that is endemic to the Azores, as well as *Pipistrellus maderensis* (morcego-da-Madeira), endemic to Macaronesia, both of which are included in Annex IV of the Habitats Directive as species in need of strict protection.

Regarding vascular plants, there are 73 endemic taxa in the Azores. Vidália (*Azorina vidalii*) is the only genus that is endemic to the Azores.

On São Jorge Island, 185 endemic terrestrial *taxa* (3 fungi, 60 plant, and 122 animal *taxa*) have been recorded, which amounts to 41% of the total endemic *taxa* on the Azores. Arthropods are the most representative group, with 86 *taxa*, including some endemic species to São Jorge, namely *Cixius azopifajo azojo* (cigarrinha-das-árvores), *Acorigone zebraneus* (aranha), *Cheiracanthium jorgense* (aranha caçadora de São Jorge), and *Pseudoblothrus oromii (*Pseudoscorpião cavernícola), *Hadena azorica* (traça), *Trechus isabelae* (carocho cavernícola), and *Trechus jorgensis* (carocho cavernícola), which represent a relevant and valuable natural heritage.

There are 10 recorded endemic Azorean bird species on São Jorge Island. The species *Nyctalus azoreum* (morcego-dos-Açores) and *Centrolabrus caeruleus* (bodião) are also present in the proposed Biosphere Reserve area.

Regarding vascular plants, approximately 75% of taxa endemic to the Azores have been recorded on São Jorge Island, including the vidália (*Azorina vidalii*).

Recently, a rare orchid species, *Platanthera azorica*, has been rediscovered. Its population is confined to the Pico da Esperança on the central mountain range of São Jorge Island. Thus three endemic Azorean orchid species have been described – *Platanthera azorica*, *Platanthera micrantha*, and *Platanthera pollostantha* – all of which occur on São Jorge Island and are covered by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

São Jorge Island's central mountain range also hosts an important reserve of the species *Chaerophyllum azoricum*.

The presence of bogs is another relevant feature of São Jorge Island. The habitats listed in Annex 1 of the Habitats Directive, namely *Active raised bogs* (7110 - priority habitat), *Degraded raised bogs still capable of natural regeneration* (7120), and *Blanket bogs*

(7130) are located on Topo Hill and play an important functional role in collecting water and releasing it to aquifers. Therefore they are essential to the island's hydrological cycle.

Regarding the island's coastal area, its vegetation displays great floristic and phytocenotic originality. On the north slope communities of *Erica azorica* (urze), *Morella faya* (faia) and *Picconia azorica* (pau-branco) predominate while the south slope is characterized by the presence of the exotic species *Pittosporum undulatum* (incenso). Other interesting floristic elements, such as *Dracaena draco* (dragoeiro), are also found, greatly enriching the island's natural landscape. In terms of forest areas, it important to mention the presence of *Criptomeria japonica* (criptoméria).

The site of the Fajãs of Caldeira de Santo Cristo Lagoon and Cubres Lagoon, which is classified under the RAMSAR Convention, is of great ecological importance as it contains habitats listed in Annex I of the Directive Habitats, including *coastal lagoons* (1150, priority habitat), *large shallow inlets and bays*, *Mediterranean salt meadows,* and *endemic Macaronesian heaths* (4050, priority habitat), which provide unique and crucial support conditions to endemic and migrating species. The existing lagoon systems are unique or rare examples within the Azores and the Macaronesian biogeographic region.

The conservation of this site is of great interest due to its high level of biodiversity and the presence of natural habitats which provide the conditions needed for the nesting and passage of migratory birds such as: *Anas platyrhynchos* (pato-real), *Calidris alba* (pilrito-das-praias), *Limosa limosa* (maçarico-de-bico-direito), *Egretta garzetta* (garça-branca), and *Numenius phaeopus* (maçarico-galego); resident aquatic birds (e.g. *Anas crecca* – pato-marreco, *Gallinula chloropus* – galinha-d'água, *Arenaria interpres* – rola-do-mar); and terrestrial birds (e.g., *Buteo buteo rothschildi* – milhafre, and *Columba palumbus azorica* – pombo-torcaz).

The local flora includes a considerable number of protected species or species of high biogeographic value such as *Erica azorica* (urze), *Juniperus brevifolia* (cedro-do-mato), *Festuca petraea* (bracel-da-rocha), *Ruppia marítima*, *Juncus acutus* (junco-agudo), *Polypogon maritimus* (Rabo-de-zorra-macio-menor), *Juncus maritimus* (junco-das-esteiras), *Solidago azorica* (cubres), *Morella faya* (faia), Myrsine retusa (tamujo), *Corema azorica* (camarinha), *Silene uniflora* (bermim), *Crithmum maritimum* (perrexil-do-mar), and *Carex hochstetteriana*.

In the marine and coastal areas several species occur that are important from a conservation point of view, including communities of culturally and economically important species such as *Patella aspera* and *Patella candei* (lapas), *Epinephelus marginatus* (meros), and *Mycteroperca fusca* (badejos). Another relevant species is the red algae *Porphyra* sp., commonly known as "erva-patinha", one species of fish endemic to the Azores, *Centrolabrus caeruleus* (bodião), and several species of cetaceans, a group which is included in its entirety in Annex IV of the Habitats Directive.

Also worthy of note is the presence of the species *Themiste sp.* (sipúncula), which has not been described in any other area in the Azores.

The Autonomous Region of the Azores has developed strategies and is equipped with tools suited to the preservation of environmental assets. It incorporates a network of protected areas which includes all of the protected areas that exist in the region. This network follows the classification adopted by the International Union for Conservation of Nature (IUCN).

In this context, the São Jorge Natural Park, the management unit for the island's classified areas, contains 13 protected areas: One Natural Monument, seven Protected Areas for the Management of Habitats/Species, one Protected Landscape Area, and four Protected Areas for the Management of Resources.

São Jorge Island is also home to internationally important classified areas which are nesting sites for important bird species, many of which are listed in Annex I of the Birds Directive and contain habitats and rare plant and animal species listed in Annex II and IV of the Habitats Directive. The island possesses 3 areas that belong to the Natura 2000 Network (1 Special Protection Area [SPA] and 2 Special Areas of Conservation [SAC]) and 23 natural habitats listed on Annex I of the Habitats Directive, 6 of which are considered to be priority habitats.

The legal frameworks applicable to these protected areas implement public policy on nature conservation, resource management, and spatial planning and management, adapting the regulation of economic activities to preserve environmental assets in order to forge a clear link between sustainability and development.

The designation of São Jorge Island as a Biosphere Reserve will strengthen ongoing efforts undertaken at regional level to ensure and promote the conservation of the present natural assets, ensuring that they are in harmony with socio-economic development.

4.3. PROVIDE AN OPPORTUNITY TO EXPLORE AND DEMONSTRATE APPROACHES TO SUSTAINABLE DEVELOPMENT ON A REGIONAL SCALE

One of the primary objectives of the application for Biosphere Reserve status is to establish it as an area in which to promote and demonstrate sustainable-development activities adapted to the local scale and conditions.

The main challenge facing São Jorge Island is related to its small, ageing population, which is caused by a lack of attractive career opportunities that would keep younger, better qualified people on the island. New ways of using and managing the land and natural resources based on sound scientific knowledge may provide new job opportunities by bringing together areas that are traditionally far apart in terms of their management and organisation, such as tourism, livestock production, fishing or even new technologies.

Consolidating modes of agriculture, livestock production and fishing which are based on good practice, validated by international or local certification mechanisms, and associating these types of productive activities and their output with tourism will lead to the creation of market niches geared towards the increasing demand for tourism destinations which stand out by offering an integrated experience combining sightseeing with an experience of local history, cultural heritage, nature, and cuisine.

São Jorge Island displays all these features and the Biosphere Reserve is a catalyst for this process of integration, which will promote changes in the way that services based on new technologies, including communication, are offered, creating and diversifying job opportunities that do not currently exist.

4.4. HAVE AN APPROPRIATE SIZE TO SERVE THE THREE FUNCTIONS OF BIOSPHERE RESERVES

The proposed Biosphere Reserve area comprises the whole of the land surface of São Jorge Island in addition to an adjacent marine area whose outer boundary is generally three miles from the shoreline. Consequently, it covers a global area that coincides with the island's own natural boundaries.

The core and buffer areas amount to a significant percentage of the proposed Biosphere Reserve. They correspond to the already classified natural and semi-natural protected areas, which enjoy a specific legal status at local, regional, and international level. As a result, the high state of conservation of the different types of habitats and ecosystems can be safeguarded, as can the ability of these areas to provide ecosystem services.

Terrestrial and marine transition areas comprise the remaining areas of the island and guarantee that the entire population is involved in applying and demonstrating various forms of land use and developing socio-economic activities guided by an environmentally sustainable approach which corresponds to the population's own motivation, as expressed in their support for the application for Biosphere Reserve status of the Fajãs de São Jorge.

Ongoing initiatives related to the implementation of good environmental practices in productive processes associated with the most important areas of economic activity will strengthen the commitment to sustainability through adherence to the Biosfera Açores [Biosphere Azores] brand, which has been created to certify products, services and goods in terms of their authenticity and good social and environmental practices.

4.5. THROUGH APPROPRIATE ZONATION

A) CORE AREAS

A LEGALLY CONSTITUTED CORE AREA OR AREAS DEVOTED TO LONG TERM PROTECTION, ACCORDING TO THE CONSERVATION OBJECTIVES OF THE BIOSPHERE RESERVE, AND OF SUFFICIENT SIZE TO MEET THESE OBJECTIVES

The Core areas proposed in the Fajãs de Sâo Jorge Biosphere Reserve include most of São Jorge Island parishes, with the exception of Calheta, and include two types of areas: Coastal and marine core areas and core land area.

The coastal and marine core areas coincide with the following protected areas, within the São Jorge Natural Park:

- The Ponta dos Rosais Natural Monument;
- The West Coast Protected Area for the Management of Resources;
- The Ponta dos Rosais Reserve Area for the Management of Catches;
- The Protected Area for the Management of Habitats and Species of the North-West Coast;
- The Protected Area for the Management of Habitats and Species of the Fajã das Almas;
- The Protected Landscape Area of the Northern Fajãs;
- The Protected Area of the Pico da Esperança and the Central Plateau
- Protected Area for the Management of the Resources of the Fajã Coasts;
- The Reserved Area for the Management of Catches of the Fajã dos Cubres / Fajã da Caldeira de Santo Cristo;
- The Protected Area for the Management of Resources of Entre Morros;
- The Reserved Area for the Management of Catches of Morro das Velas;
- The Protected Area for the Management of Habitats and Species of the South-West Coast;
- The Protected Area for the Management of Habitats and Species on the Islet of Topo;
- The Protected Area for the Management of Resources on Topo;
- Reserve Area for the Management of Catches in Ponta do Topo.

The **Ponta dos Rosais Natural Monument (SJO01)** consists of a land surface that occupies approximately 170 ha, including the west tip of the island and the small islets which surround it. In this area it is possible to observe some endemic plant species such as *Erica azorica* (urze), and *Myosotis marítima* (não-me-esqueças). This place, which hosts important nesting marine bird species such as *Sterna hirundo* (garajau-comum), *Sterna dougallii* (garajau-rosado), *Calonectris borealis* (cagarro), and *Pufinus assimilis baroli*

(frulho), is considered an important bird and bird diversity area, with the "Rosais" IBA extending along the north coast to the Fajã de João Dias.

The **West Coast Protected Area for the Management of Resources (SJO010)** occupies a total area of 209.38 ha, with an emerged area of 0.5 ha and an altitude of 73 metres corresponding to the islet of Rosais. Located in the westernmost tip of the island, this protected marine area is characterized by a high degree of hydrodynamism as its intertidal zone contains a significant abundance of cirripedes (*Chthamalus stellatus* and *Megabalanus azoricus* - cracas). The algae community is relatively diminished in the subtidal zone due to the presence of strong currents. This coastal area is rich in pelagic carnivorous fish species (*e.g.*, *Sphyraena* viridensis - bicudas, *Seriola* dumerili - lírios, *Pomatomus saltatrix* - anchovas, *Sarda sarda* – serra, and *Katsuwonus pelamis* - bonitos). These species roam the water column in search of potential prey, which consist of shoals of small pelagic fish species (e.g. *Trachurus picturatus* - chicharros, *Pagellus bogaraveo* – carapaus, and *Boops boops* - bogas). Near the seabed there are various species of crustaceans, echinoderm, molluscs, and benthic ichthyofauna, which are very common in the overall subtidal zone of São Jorge Island. *Scyllarides latus* (cavaco), *Sphaerechinus granularis* (ouriço-do-mar), *Loligo forbesi* (lula), and *Scorpaena scrofa* (rocaz) stand out for their economic value.

This protected area is fully integrated within the boundaries of the **Ponta dos Rosais Reserve Area for the Management of Catches**, which include the area's islets.

The Ponta dos Rosais Natural Monument and the West Coast Protected Area for the Management of Resources incorporate the objectives and boundaries defined for the Ponta dos Rosais Special Area of Conservation (SAC), which includes 7 types of habitats listed in Annex I of the Habitats Directive, one of which is a priority habitat.

The **Ponta dos Rosais SAC (PTJOR0013)** is a coastal site dominated by coastal cliffs with endemic vegetation, erica heaths and pasture areas. The extraordinary power of the natural elements at this end of the island shapes the ecological uniqueness of the area, where mountain formations combine with coastal elements. This area has the distinction of being home to a meadow of *Rumex azoricus* (Labaça-das-ilhas), which is part of the "Rosais" IBA, an area extending along the north coast to the Fajã de João Dias, which is important for the protection of the bird species *Calonectris borealis* (cagarro), *Sterna hirundo* (garajau-comum), *Sterna dougallii* (garajau-rosado) and *Pufinus assimilis baroli* (frulho).

Occupying a total area of 307.08 ha, of which 140.29 ha are a marine area, this SAC contains four identified natural terrestrial habitats listed in Annex I of the Habitats Directive: *Annual vegetation of drift lines* (1210); *Perennial vegetation of stony banks* (1220); *Vegetated sea cliffs with endemic flora of the Macaronesian coasts* (1250); *Endemic macaronesian heaths* (4050); and 4 four plant species listed in Annex II of the aforementioned Directive: *Erica azorica* (urze); *Myosotis maritima* (não-me-esqueças); *Scabiosa nitens; Rumex azoricus* (labaça-das-ilhas).

In the marine area, the bottom possesses a range of typologies and substrates, including several small caves and crevices. The biotopes found there are typical of very exposed areas. The more hydrodynamic area, associated with depths of up to 5 metres, is dominated by coralline encrusting algae, with some patches of *Ulva* spp. At greater depths, *Cystoseira* sp., *Halopteris filicina*,

Asparagopsis armata, *Litophylum* sp. can be found. As the depth increases, so does the occurrence of patches of *Padina pavonica,* which are then replaced in the deeper zones by *Zonaria tournefortii*. Large shoals of pelagic fish species (*e.g. Trachurus picturatus* - chicharros, *Pagellus bogaraveo* – carapaus, and *Boops boops* - bogas) are also common.

In these areas, the following natural marine habitats listed in Annex I of the Habitats Directive have been identified: *Large shallow inlets and bays* (1160), *Reefs* (1170), and *Submerged or partially submerged sea caves* (8330). Furthermore, the following animal species listed in Annex II of the Habitats Directive have been identified: *Tursiops truncatus* (Golfinho-roaz), and *Caretta caretta* (Tartaruga-careta).

Other important species from both a conservation and a resource perspective include the following: *Patella aspera* (Lapa-brava), *Patella candei* (Lapa-mansa), *Octopus vulgaris* (Polvo-comum), *Megabalanus azoricus* (Craca), *Palinurus elephas* (Lagosta), *Maja capensis* (Santola), *Scylarides latus* (Cavaco), *Coryphoblennius galerita* (Caboz-de-crista), *Epinephelus marginatus* (Mero), *Mullus surmuletus* (Salmonete), *Phycis phycis* (Abrótea), *Arenaria interpres* (Rola-do-mar), *Calidris alba* (pilrito-das-praias), *Charadrius alexandrinus* (Borrelho-de-coleira-interrompida), *Larus michahellis atlantis* (Gaivota), *Larus marinus* (Alcatraz-comum), *Larus ridibundus* (Guincho-comum) e *Numenius phaeopous* (Maçarico-galego), *Delphinus delphis* (Golfinho-comum) and *Grampus griseus* (Moleiro ou grampo), and *Porphyra* sp. (Erva patinha).

The core areas that coincide with the coastal *fajãs* are distributed across the island. These have been defined in accordance with their importance in terms of landscape conservation and protection. They include sites that are of particular conservational relevance because they belong to protected parts of the São Jorge Natural Park and to SACs, SPAs and IBAs. Their cultural importance and built and classified heritage have also been taken into account.

The Fajã de João Dias, Fajã Vasco Martins, Fajã Rasa and Fajã do Manuel Teixeira are located in the protected area defined within the São Jorge Natural Park, which has been designated a **Protected Area for the Management of Habitats and Species of the North-West Coast (SJO02)**. The Fajã das Almas is adjacent to the **Protected Area for the Management of Habitats and Species of the Fajã das Almas (SJO06)**.

The Fajã Isabel Pereira, Fajã Ribeira d'Areia, Fajã Chã, Fajã dos Azevinhos, Fajã do Mero, Fajã da Abelheira, Fajã das Funduras, Fajã da Penedia, Fajã das Pontas, Fajã da Neca, Fajã da Betesga, Fajã dos Cubres, Fajã do Belo, Fajã dos Tijolos, Fajã da Caldeira de Santo Cristo, Fajã Redonda, Fajã do Sanguinhal, Fajã de Entre Ribeiras, Fajã de Salto Verde, Fajã do Norte das Fajãs, Fajã da Ribeira Funda, Fajã do Norte Estreito and Fajã do Nortezinho coincide with the **Special Protected Landscape of the Northern Fajãs (SJO09)**, occupying an area of around 2,926 ha. This protected area includes a large number of *fajãs* and their hillsides, establishing a link with the **Protected Area of the Pico da Esperança and the Central Plateau (SJO05)**. This area is noted for the harmonious interaction between its natural and cultural features, as expressed in the landscape and in traditional uses, building practices, and social and cultural events.The areas of this group which are most noteworthy, particularly due to their lagoons, are the Fajã dos Cubres and the Fajã da Caldeira de Santo Cristo, which are within the boundaries of various classified areas such as the **Protected Landscape Area of the Fajãs do Norte (SJO09),** the **Protected Area for the Management of the Resources of Fajã Coasts (SJO12),**

the Reserved Area for the Management of Catches of the Fajã dos Cubres / Fajã da Caldeira de Santo Cristo, and the **North-East Coast and Ponta do Topo SPA**. These areas are also classified as RAMSAR sites.

In fact, the view of these *fajãs* and their lagoons is one of the most striking that can be found on São Jorge island. These lagoon systems are unique in the Azores and offer shelter to various migratory and nesting species such as the *Ardea cinerea* (garça-real), the *Numenius phaeopus* (maçarico-galego), the *Sterna hirundo* (garajau-comum) and the *Calonectris borealis* (cagarro).

Furthermore, the lagoon of the Fajã da Caldeira de Santo Cristo is the only one in the Azores where clams (*Ruditapes decussatus*) can be found.

Various species of resident or migratory seabirds that feed from the waters of the lagoon can be observed in it, including *Larus michahellis atlantis* (gaivotas), *Sterna dougallii* (garajau-rosado) and *Sterna hirundo* (garajau-comum). On the banks it is possible to observe the *Charadrius hiaticula* and *Charadrius semipalmatus* (borrelhos); *Calidris alba*, *C. fuscicollis* and *C. malanotus* (pilritos); *Arenaria interpres* (rolas-do-mar); *Numenius phaeopus* and *Limosa limosa* (maçaricos); *Egretta garzetta* (garça-branca); and the *Ardea cinerea* (garça-real). The *Calonectris borealis* (cagarro) nests on the coastal cliffs of the *fajã* and feeds on the open sea.

This area is accessible via the Serra do Topo / Fajã da Caldeira de Santo Cristo / Fajã dos Cubres footpath, the most important footpath on São Jorge island, which begins in the Serra do Topo at an altitude of around 700 metres and finishes at sea level, at the Fajã dos Cubres.

The Fajã dos Cubres [Fajã of the Seaside Goldenrod], so-called because the yellow-flowered plant is found in abundance at the site, also possesses a coastal lagoon, albeit a brackish-water one, which probably represents a more advanced stage in the natural evolution of coastal lagoons. The lagoon is isolated from the sea by a barrier of stony banks and is not linked to the ocean by a channel. Thus fresh water from the rain and run-off from the land play a large part in shaping this habitat. The elongated orientation of the lagoon, which runs from east to west, and the presence of a central islet to which a footbridge has been constructed, have caused the salinity of the lagoon to become highly stratified, both length and depth-wise. Thus, the eastern side is essentially fresh water while the western side is essentially brackish, with the highest salinity level found near the bottom (max. 26‰) and the lowest at the surface (10-18‰)[4]. A thick layer of sediments resulting from the deposition and decomposition of organic matter lies across the whole of the bed of the lagoon. One of the most interesting aspects of this lagoon is that it is home to populations of the only marine vascular plant to have been recorded in the Azores, rupia (*Ruppia maritima*), which grows in areas containing green filamentous algae (*Enteromorpha* sp.) and other species of lake flora.

The marine part of the lagoon is noted for its dense populations of *Palaemon adspersus* (camarões das poças), among other invertebrates (polychaetes, amphipoda and isopoda). In contrast to Fajã da Caldeira de Santo Cristo lagoon it contains few fish species due to the low salinity levels. Thus, only the *Chelon labrosus* (tainhas) and the *Trachinotus ovatus* (prombetas) can survive in the lagoon, albeit sporadically and in small numbers.

4 Morton *et al.*, 1998.

Various species of terrestrial and marine birds feed and nest on the banks of the lagoon. The former group includes various species of domestic and wild ducks (e.g. *Anas platyrhynchos* and *Anas crecca*) and *Gallinula chloropus* (galinholas-de-água). The marine birds include the *Larus michahellis atlantis* (gaivotas), the *Charadrius alexandrinus* (borrelhos), the *C. melanotos* (pilritos), the *Arenaria interpres* (rolas-do-mar), the *Numenius phaeopus* and *Limosa limosa* (maçaricos), the *Egretta garzetta* (garça-branca) and the *Ardea cinerea* (garça-real). The *Sterna dougallii* (garajau-rosado) and *Sterna hirundo* (garajau-comum) feed in the waters of the lagoon and nest on its banks while the *Calonectris borealis* (cagarro) nests on the coastal cliffs of the *fajã* and feeds on the open sea.

The Fajã dos Cubres and its lagoon form part of the protected areas of the São Jorge Natural Park, specifically the **Protected Landscape Area of the Fajãs do Norte (SJO09)** and the **Protected Area for the Management of the Natural Resources of the Fajã Coasts (SJO12)**. It is also classified as a RAMSAR Site.

The **Protected Area for the Management of the Resources of the Fajã Coasts (SJO12)** occupies a total area of 876.22 ha and partially coincides with the R**eserved Area for the Management of Catches of the Fajã dos Cubres / Fajã da Caldeira de Santo Cristo**.

The coastline of this protected marine area is characterized by reefs and sandbanks formed by basalt deposits from the slope of the Serra do Topo volcano complex. This area is characterized by frequent, striking ocean-wave activity. Clear zonation characterized by unequal distribution of the algal substrate and of some species of marine invertebrates can be observed in the intertidal zone. The upper strip of the intertidal zone is dominated by lichen, cyanobacteria and gastropoda (e.g. lapas – *Patella aspera* and *Patella candei gomesii*). At a lower level, different bands of algae appear, namely, coralline algae such as *Corallina sp.* and *Jania sp.*, as well as barnacles (cracas - *Megabalanus azoricus*). The exotic alga *Asparagopsis armata* appears on the lower boundary of the intertidal zone and in the subtidal zone. The ichthyofauna is similar in every respect to that found around the whole of São Jorge island. In terms of ecological value, however, the most important species is the *Symphodus caeroleus* (bodião-azul), a species that is endemic to the Azores. The lagoon area is an important 'maternity ward' for *Epinephelus marginatus* (meros), allowing this species to exist in abundance in adjacent areas.

The **Entre Morros Protected Area for the Management of Resources (SJO11)** occupies a total marine area of 246.52 ha and coincides with the **Morro das Velas Reserved Area for the Management of Catches**.

The **Protected Area for the Management of Habitats and Species of the South-West Coast (SJO03)** borders the Entre Morros Protected Area for the Management of Resources and is an important bird and bird diversity area (IBA).

This protected marine area is notable for a striking islet located near the side of the hill to the north-west. This islet rises to a height of around 30 metres above the water and descends to a depth of 10 metres. The emersed area provides migratory marine birds with a safe point for resting, reproducing and nesting. The *Gymnothorax unicolor*, *Muraena helena*, *Muraena augusti* (moreias), *Apogon imbersis* (foliões) and *Octopus vulgaris* (polvos) use the crevices of this islet as a shelter while the water column near the vertical cliff face is home to an abundance of *Sarpa salpa* (salemas), *Diplodus sargus* (sargos), *Chromis limbata* and *Abudefduf luridus* (castanhetas). The submerged area of the sheltered bay to which this marine area belongs is characterised by the presence of large blocks of basalt rock. The sandy substrate reaches the 20-metre bathymetric line. The following species predominate on the

sandy bottom: *Mullus surmulltus* (salmonetes), *Bothus podas maderensis* (solhas), *Synodus saurus* (peixes lagartos) and occasionally *Dasyatis pastinaca* (ratões).

The **Protected Area for the Management of Resources of Topo (SJO13)** occupies a total area of 609.78 ha, with the emersed area of the Islet of Topo occupying 12.1 ha and rising to a height of 19 metres. This protected area partially coincides with the **Reserve Area for the Management of Catches in Ponta do Topo**, including the Islet of Topo. The Islet of Topo is a protected zone that has been designated the **Protected Area for the Management of Habitats or Species of the Islet of Topo (SJO08)**. Owing to the small size and isolation of this area of land, it is floristically poor although *Festuca petraea* (bracel-da-rocha) can easily be observed. However, marine birds such as *Calonectris borealis* (cagarro), *Sterna hirundo (*garajau-comum) and *Sterna dougallii* (garajau-rosado) are frequently seen on this islet, granting it important bird and bird diversity area (IBA) status.

In the rocky parts of this protected marine area (which include rocky beds, blocks and walls), the most common and abundant coastal fish species are *Abudefduf luridus* (castanheta-azul), the *Symphodus caeruleos* (bodião-verde), *Chromis limbata* (castanheta-castanha), the *Coris julis* (peixe-rei), *Diplodus sargus* (sargo), the *Labrus bergylta* (bodião-vermelho), *Sarpa salpa* (salema), *Scorpaena maderensis* (rascasso), the *Serranus atricauda* (garoupa), *Sparisoma cretense* (veja), the *Thalassoma pavo* (raínha), *Sphoeroides marmoratus* (sopapo), and *Trypterygion delaisi delaisi* (caboz-de-três-dorsais). To the north of the Islet of Topo there are several blocks of basalt rock that descend to depths of between 15 and 25 metres. This topography, which favours strong currents, makes this site ideal for pelagic fish (e.g. *Sphyraena viridensis* – bicudas and *Pseudocaranx dentex* - encharéus). In addition to the aforementioned species, the lower depths, close to the islet and between the basalt corridors, are home to exceptional numbers of *Epinephelus marginatus* (meros), *Mycteroperca fusca* (badejos), and large colourful *Bodianus scrofa* (peixes-cão). Near the south coast of the Islet of Topo, at depths of between 5 and 10 metres, there are blocks of rock covered in *Megabalanus azoricus* (cracas) and *Arbacia lixula e Paracentrotus lividus* (ouriços-do-mar).

This zone is included in the territorial boundaries of the **North-West Coast and Ponta do Topo SAC (PTJOR0014)** and also the I**slet of Topo and Adjacent Coast SPA (PTZPE0028)**. This SAC, which occupies a total area of 3,965.15 ha (389.30 ha of which is a marine area), is home to many elements listed on the Habitats Directive, such as: Natural land and sea habitats listed in Annex I of the Directive – *Annual vegetation of drift lines* (1210), *Perennial vegetation of stony banks* (1220), *Vegetated sea cliffs with endemic flora of the Macaronesian coasts* (1250), E*ndemic Macaronesian heaths* (4050), *Large shallow inlets and bays* (1160), Reefs (1170), and *Submerged or partially submerged caves* (8330) – and flora and fauna listed in Annex II of the same Directive – *Ammi trifolatum* (pé-de-pomba), *Azorina vidalii* (vidália), *Spergularia azorica*, *Scabiosa nitens*, *Erica azorica* (urze), *Rumex azoricus* (labaça-das-ilhas), T*ursiops truncatus* (golfinho-roaz), and *Caretta caretta* (tartaruga-careta).

Other important species from both a conservation and a resource perspective include the following: *Patella aspera* (lapa brava), *Patella candei* (lapa mansa), *Octopus vulgaris* (polvo-comum), *Megabalanus azoricus* (craca), *Ruditapes decussatus* (amêijoa-boa), *Palinurus elephas* (lagosta), *Maja capensis* (santola), *Scyllarides latus* (cavaco), *Epinephelus marginatus* (mero), *Mycteroperca fusca* (badejo), *Pagellus bogaraveo* (carapau quando juvenil), *Mullus surmuletus* (salmonete), *Parablennius ruber* (caboz-lusitano), *Lipophrys*

pholis (caboz-gigante), *Phycis phycis* (abrótea), *Gobius paganellus* (bochecha), *Gaidropsarus guttatus* (viúva), *Pagrus pagrus* (pargo), *Coryphoblennius galerita* (caboz-de-crista), *Lipophrys trigloides* (caboz), *Parablennius incognitus* (caboz-das-cracas), *Diplecogaster bimaculata pectoralis* (peixe-ventosa-dos-ouriços) and *Porphyra* sp. (erva patinha).

The coastal part of this SAC is also home to species of marine birds such as *Calonectris borealis* (cagarro), *Sterna dougallii* (garajau-rosado), *Sterna hirundo* (garajau-comum) and various terrestrial birds, including *Columba palumbus azoricus* (pombo-torcaz-dos-Açores).

The core land area of the proposed Biosphere Reserve coincides with a protected elevated area defined within the São Jorge Natural Park, specifically, the **Protected Area for the Management of Habitats or Species of Pico da Esperança and the Central Plateau (SJO05)** and the geo-site of the Central Volcanic Range. This area is also classified as an internationally important wetland in the context of the RAMSAR Convention.

Its territory is continuous with the **Protected Landscape Area of the Northern Fajãs**, which is included in the Core Coastal and Marine Area of Cubres and Fajã da Caldeira de Santo Cristo and also includes part of the **North-West Coast and Ponta do Topo SAC (PTJOR0014)**, which contains many of the habitats listed on the Habitats Directive Annexes.

This is one of the richest biological areas, where certain rare species such as *Chaerophyllum azoricum* and *Ammi trifoliatum* can be found. This site is also home to a great diversity of habitats that are largely in their natural states, including *Blanket bogs (active bogs), Endemic forests with juniperus* and *Macaronesian mesophile grasslands.*

The Protected Area for the Management of Habitats and Species of Pico da Esperança and the Central Plateau (SJO05) occupies an area of 1,087.22 ha and is approximately located in the centre of the island, covering the highest point of the island, the Pico da Esperança, which rises to a height of around 1053 metres. From here it is possible to observe the alignment of the volcanic cones that traverse the island from one end to the other in an east-west direction. Owing to its relief, altitude and difficulty of access, this site is well preserved and can be considered a privileged habitat for fauna. In fact, this is the only place in the world where it is possible to observe species of arthropods such as *Trechus jorgensis*, *Trechus isabelaei* and *Cheiracanthium jorgeense. Gallinago gallinago* (narceja) is the best represented species of avifauna in this site, which also hosts some migratory birds. Where flora is concerned, significant numbers of native and endemic species can be found, including the following representatives of Macaronesian mesophile grassland habitats (6180): *Leontodon filii* (patalugo-maior), *Tolpis azorica, Erica azorica* (urze), *Hypericum foliosum* (furalha), *Potentilla anglica, Huperzia dentata, Osmunda regalis (*feto-real), *Calluna vulgaris* (rapa), *Blechnum spicant* e *Holcus rigidus*.

Rare vascular plants such as *Chaerophyllum azoricum, Euphrasia grandiflora, Scabiosa nitens, Rumex azoricus* (labaça-das-ilhas), *Platanthera pollostantha* and *Platanthera micrantha* (conchelo-do-mato) are also common in this area, which is the only known place in the world where it is possible to find *Platanthera azorica*, the rarest orchid in Europe.

Some of these species would not be able to exist without the bogs found on this site. In fact, it was the water conditions and the diversity of endemic and native plants, dominated by *Sphagnum spp.* (esfagno), that led this area of the island to be classified as the RAMSAR Site – Central Plateau of São Jorge (Pico da Esperança).

Eleven natural terrestrial habitats listed in Annex I of the Habitats Directive have been identified for this site: *Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea* (3130), *Natural dystrophic lakes and ponds* (3160), *Endemic macaronesian heaths* (4050), *Thermo-Mediterranean and pre-desert scrub* (5330), *Macaronesian mesophile grasslands* (6180), *Active raised bogs* (7110), *Degraded raised bogs still capable of natural regeneration* (7120), *Blanket bogs (if active bog)* (7130), *Caves not open to the public* (8310), *Macaronesian laurel forests (Laurus, Ocotea)* (9360), *Endemic forests with Juniperus spp.* (9560) – and 15 species of flowers can be found that are protected by the same Directive – *Ammi trifoliatum* (pé-de-pomba), *Arceuthobium azoricum* (espigos-de-cedro), *Chaerophyllum azoricum*, *Culcita macrocarpa* (feto-do-cabelinho), *Erica azorica* (urze), *Euphorbia stygiana* (trovisco-macho), *Euphrasia grandiflora*, *Frangula azorica* (sanguinho), *Isoetes azorica*, *Prunus azorica* (ginja), *Rumex azoricus* (labaça-das-ilhas), *Sanicula azorica* (erva-do-capitão), *Scabiosa nitens*, *Trichomanes speciosum*, and *Woodwardia radicans* (feto-do-botão).

B) BUFFER ZONES — A BUFFER ZONE OR ZONES CLEARLY IDENTIFIED AND SURROUNDING OR CONTIGUOUS TO THE CORE AREA OR AREAS, WHERE ONLY ACTIVITIES COMPATIBLE WITH THE CONSERVATION OBJECTIVES CAN TAKE PLACE

The proposed Buffer Zones are areas whose size and legal status allow them to complement core areas in respect of nature conservation and biodiversity. These zones have been defined in accordance with their prior established legal status and with topographic and functional aspects that provide functional continuity between these zones and core and transition areas.

In general terms, the proposed buffer zones are characterised by possessing a good environmental state in which the presence of ecologically valuable and representative habitats and species is registered. From the point of view of human activity, they are characterised by low population densities and by the existence of some agricultural and fishing activity as well as small-scale fishing in coastal and marine areas. These areas are also associated with some regulated, low-impact tourism activity that is always practised in a way that respects the environment.

The buffer zones of the Fajãs de São Jorge Biosphere Reserve occupy a total area of 11,067.58 ha, of which 5,317.29 ha are terrestrial and 5,750.29 ha are marine. These zones include protected areas that form part of the São Jorge Natural Park and are classed as Protected Areas for the Management of Habitats or Species and for the Management of Resources, specifically:

- The Protected Area for the Management of Habitats and Species of the North-West Coast;
- The Protected Area for the Management of Habitats and Species of the Fajã das Almas;
- The Protected Area for the Management of Habitats and Species of the South-West Coast;
- The Protected Area for the Management of Habitats and Species of the Topo Coast;
- The Protected Area for the Management of the Resources of Topo.

The **Protected Area for the Management of Habitats or Species of the North-West Coast (SJO02)** occupies an area of around 701 ha, starting from the end of the protected area of the Natural Monument of Ponta dos Rosais and extending along the north coast to Ribeira da Fonte, to the east of the Fajã da Ponta Furada.

This area is home to certain types of vegetation that are endemic to the Azores, such as *Picconia azorica* (pau-branco) and *Erica azorica* (urze). Where fauna is concerned, the area is chiefly known for *Columba palumbus azorica* (pombo-torcaz dos Açores) and some marine birds such as *Calonectris borealis* (cagarro) and *Sterna hirundo* (garajau-comum) nest here. For this reason, it is classed as an important bird and bird diversity area (IBA).

The **Protected Area for the Management of Habitats or Species of the South-West Coast (SJO03)** occupies an area of 207.2 ha, beginning in the most westerly part of the Morro Grande das Velas and extending along the south of the island to the boundary of the protected area of the Natural Monument of Ponta dos Rosais. This area is also an important bird and bird diversity area (IBA) as it is a nesting site for *Sterna hirundo* (garajau-comum) and *Calonectris borealis* (cagarro). Where flora is concerned, the area is chiefly noted for species such as *Picconia azorica* (pau-branco), *Erica azorica* (urze) and *Myosotis maritima* (não-me-esqueças).

The **Protected Area for the Management of Habitats or Species of the Fajã das Almas (SJO06)** occupies an area of around 97 ha of the island, including the hillside of the Fajã das Almas. Being a coastal area, it is often inhabited by marine birds such as *Calonectris borealis* (cagarro) and *Sterna hirundo* (garajau-comum), making it an important bird and bird diversity area (IBA). Species such as *Erica azorica* (urze), *Picconia azorica* (pau-branco) and *Morella faya* (faia) are only some of the examples of flora that can be found in this area.

The **Protected Area for the Management of Habitats or Species of the Topo Coast (SJO07)** occupies a land area of around 387.8 ha, bounded by the Funda River and the Lixívias River. This area is classed as an important bird and bird diversity area (IBA) due to the diversity of birds that nest on this coast, which include *Sterna dougallii* (garajau-rosado) and *Sterna hirundo* (garajau-comum). Where flora is concerned, the area is home to a great diversity of species, such as *Azorina vidalii* (vidália), *Euphorbia stygiana* (trovisco-macho) and *Juniperus brevifolia* (cedro-do-mato). This Protected Area incorporates the objectives defined for the Islet of Topo SPA and also for the North-East Coast and Ponta do Topo SAC since it partially coincides with their boundaries.

The **Islet of Topo and Adjacent Coast SPA (PTZPE0028)**, which occupies 369.75 ha, includes the range of coastal cliffs between the Cabeço da Cruz river and the Fajã do Nortezinho and the coastal islets. This area contains a significantly diverse range of priority marine birds listed in Annex I of the Birds Directive. This is particularly true of the Islet of Topo, which is a nesting site for *Sterna dougallii* (garajau-rosado), *Sterna hirundo* (garajau-comum), *Puffinus assimilis baroli* (frulho), *Hydrobates castro* (painho) and *Calonectris borealis* (cagarro).

The natural terrestrial habitats listed in Annex I of the Habitats Directive that can be found in the aforementioned SPE are the following: *Annual vegetation of drift lines* (1210), *Perennial vegetation of stony banks* (1220), *Vegetated sea cliffs with endemic flora of the Macaronesian coasts* (1250) and *Endemic macaronesian heaths* (4050). In turn, the natural marine habitats listed in Annex I of the Habitats Directive that can be found in this SPA are: *Large shallow inlets and bays* (1160), *Reefs* (1170) and *Submerged or partially submerged sea caves* (8330).

The area covered by the SPE and the surrounding area are home to 6 identified species of flora listed in Annex II of the Habitats Directive, namely: *Ammi trifolatum* (pé-de-pomba), *Azorina vidalii* (vidália), *Spergularia azorica*, *Scabiosa nitens*, *Erica azorica* (urze) e *Rumex azoricus* (labaça-das-ilhas). *Nyctalus azoreum* (morcego-dos-Açores), the only mammal that is endemic to the Azores, as well as the bird subspecies *Columba palumbus azoricus* (pombo-torcaz-dos-Açores), are evenly distributed within this area.

C) TRANSITION AREAS — AN OUTER TRANSITION AREA WHERE SUSTAINABLE RESOURCE MANAGEMENT PRACTICES ARE PROMOTED AND DEVELOPED

In the proposal for the Biosphere Reserve, two types of Transition Areas are considered: a terrestrial transition area and a marine transition area.

The terrestrial transition area corresponds to the entirety of the remaining emersed territory of the island of São Jorge that is not included within the Core Area and Buffer Zones, occupying a total area of 14,686.65 ha. This area is where the main human settlements are found and where most socio-economic activities are carried out.

The marine transition area corresponds to an area surrounding the island of São Jorge delimited by a distance of 3 miles in relation to the coastline.

Owing to the limited extension of the insular platform of the island of São Jorge, the marine transition area is characterised by its quite steep slope, which reaches bathymetric depths of over 1,000 metres. This marine transition strip includes a multiplicity of coastal, oceanic, pelagic and benthic habitats that are home to a wide range of marine animals with different ecological affinities. In the rocky marine depths of the underwater slopes of the island, coral, anemones, hydrozoa and cold-water sponges shape benthic habitats that are home to moving invertebrates (molluscs, crustaceans, echinoderms etc.) and diverse demersal fish (e.g., *Conger conger* - congro, *Pagellus bogaraveo* - goraz, *Phycis phycis* – abrótea, *Helicolenus dactylopterus* – boca-negra, or macrourídeos, among other species). The deep ocean currents carry nutrients and bathypelagic mesofauna (fish, squid, crustaceans and gelatinous organisms), which accumulate on the slopes of the islands. Near the bottom, these organisms constitute important prey for carnivorous demersal fish, their high density attracting large pelagic predators such as cetaceans and birds, which seek food there.

Groups of female and juvenile *Physeter macrocephalus* (cachalote) are regularly seen in this area, feeding on deep-water cephalopods. In spring and autumn, there are occasional sightings of baleen whales (*Baleanoptera musculus* – baleia-azul; *Baleanoptera physalus* – baleia comum; *Baleanoptera borealis* – baleia-sardinheira; *Megaptera novaeangliae* – baleia-de-bossas), filtering plankton over the slopes of the island.

The slopes of the islands are ecosystems in which the oceanic environment penetrates the coastal environments. In low-lying coastal and oceanic areas the interaction between these two types of fauna is more intense. In these habitats, marine turtles, ocean

sharks and manta rays intermingle with small coastal fish, black coral and other coastal organisms. On the coastal strips, rocky benthic habitats are characterized by algae communities that house a great diversity of invertebrates. The fish that typically occur in this area include species such as *Abudefduf luridus* (castanheta-azul), *Chromis limbata* (castanheta-castanha), *Coris julis* (peixe-rei), *Thalassoma pavo* (rainhas), *Diplodus sargus* (sargo), *Sarpa salpa* (salema), *Scorpaena maderensis* (rascasso), and *Serranus atricauda* (garoupa), among others. Pelagic fish species include *Trachurus* picturatus (chicharro), *Sardina* pilchardus (sardinhas) and *Pagellus bogaraveo* (carapau), which serve as food for so-called 'blue fish' (e.g., *Sphyraena viridensis* – bicudas, *Sarda sarda* – serras, *Seriola spp.* – lírios, and *Katsuwonus pelamis* – bonitos, among others).

D) PLEASE PROVIDE SOME ADDITIONAL INFORMATION ABOUT THE INTERACTION BETWEEN THE THREE AREAS

The three types of areas (core, buffer and transition) that make up the proposed biosphere reserve will function in conjunction and connection with each other, requiring harmonious and functional interaction to take place between them. This is because the proposed designation area covers the whole of the terrestrial territory of São Jorge island (and therefore its entire population) and a significant marine area around the island, defined in relation to the corresponding coastline.

In the core areas, the legal protection in force monitors the development of some activities, with nature conservation being the priority.

The buffer zones function as a means of protecting the core areas in advance of the transition areas, where economic activities play the predominant role.

It should be noted that the legal framework in force in the Autonomous Region of the Azores provides for norms appropriate to the fulfilment of the various functions of each of the areas that make up the Fajãs de São Jorge Biosphere Reserve.

4.6. ORGANIZATIONAL ARRANGEMENTS SHOULD BE PROVIDED FOR THE INVOLVEMENT AND PARTICIPATION OF A SUITABLE RANGE OF INTER ALIA PUBLIC AUTHORITIES, LOCAL COMMUNITIES AND PRIVATE INTERESTS IN THE DESIGN AND THE CARRYING OUT OF THE FUNCTIONS OF A BIOSPHERE RESERVE

4.6.1. DESCRIBE ARRANGEMENTS IN PLACE OR FORESEEN

Various stakeholders in the public, private and voluntary spheres are located within the proposed biosphere reserve. These stakeholders are involved in the application process since they have actively participated in its development.

During the launch of the application process for the Fajãs de São Jorge Biosphere Reserve, an informal support group was set up that included local authorities (municipalities), agricultural and fishing organisations, private associations working in the fields of the environment and natural-heritage conservation, and various renowned figures.

This group met several times throughout the process and made a decisive contribution to the drawing up of this application, including the draft of the Action Plan for the Proposed Biosphere Reserve.

In future, the stakeholders will play a key role in the development of the proposed biosphere reserve within their different areas, acting as the driving force behind its sustainable economic development.

It is necessary to stress that the status of Biosphere Reserve is enshrined in the legal system of the Network of Protected Areas of the Autonomous Region of the Azores, granting stakeholders the right to participate publicly in all stages of its development and operations.

4.7. MECHANISMS FOR IMPLEMENTATION

A) MECHANISMS TO MANAGE HUMAN USE AND ACTIVITIES IN THE BUFFER ZONE OR ZONES

In the buffer zones of the Biosphere Reserve there are mechanisms for monitoring and managing land use and the occupation of the territory. These mechanisms include the various legal instruments in force, such as the Sectoral Plan for the Natura 2000 Network in the Autonomous Region of the Azores; the legal systems for the conservation of nature and the protection of biodiversity and the São Jorge Natural Park; the Land-Use Plan for the Coastal Area of São Jorge (POOC); and the Municipal Master Plans (PDM) for Calheta and Velas. A large part of the buffer zone will fall within these classified and regulated areas.

B) MANAGEMENT POLICY OR PLAN FOR THE AREA AS A BIOSPHERE RESERVE

The policies and norms provided for in the following public policies and legal instruments will remain in force for the areas of the Fajãs de São Jorge Biosphere Reserve: The Regional Land-Use Plan for the Azores (PROTA); the Sectoral Plan for the Natura 2000 Network in the Autonomous Region of the Azores(PSRN2000); the Regional Water Plan (PRA); the Plan for Managing the Hydrographic Region of the Azores (PGRH-Açores); the Tourism Management Plan for the Autonomous Region of the Azores (POTRAA); and the Strategic Plan for the Management of Waste in the Azores (PEGRA).

The Sectoral Land-Use Plan for Mining Activities in the Autonomous Region of the Azores (PAE) has recently been approved with a view to executing an integrated management policy for non-metallic mineral resources in all municipalities on the Azores, thereby rationalising the activities of the mining industry.

At the time of writing, the Regional Plan for Climate Change (PRAC) is being drawn up with a view to implementing the Regional Strategy for Climate Change, which was approved by Regional Government Council Resolution no. 123/2011 of 19 October.

Specifically, under the umbrella of the São Jorge Natural Park, the Management Plan for the Fajãs da Caldeira de Santo Cristo and dos Cubres (PGFCSCC) has been in force since 2010.

In addition to the action plan for the São Jorge Natural Park, a specific action plan for the proposed Biosphere Reserve will be created under the terms set out in article 52 of Regional Legislative Decree no. 15/2012/A of 2 April. The Action Plan for the Fajãs de São Jorge Biosphere Reserve, the draft of which is enclosed with this form, will be drawn up in conjunction with the local community and, in addition to detailing the actions to be carried out, must contain a specific environmental education programme

and internal and external promotional activities required to fulfil the aims set down for the area in question.

Lastly, reference should be made to Resolution no. 12/2015/A of 20 March of the Legislative Assembly of the Azores, which recommends that the Government of the Azores, in close collaboration with the municipalities, should draw up the Integrated Plan for the Development of the Fajãs of the Island of São Jorge.

C) DESIGNATED AUTHORITY OR MECHANISM TO IMPLEMENT THIS POLICY OR PLAN

The Fajãs de São Jorge Biosphere Reserve will be managed by the São Jorge Natural Park, an operational structure within the Government of the Azores that forms part of the department responsible for the environment under the terms set out in article 53 of Regional Legislative Decree no. 15/2012/A of 2 April.

The management structure of the Biosphere Reserve will also include a Management Board led by the Director of the São Jorge Natural Park, with the composition and competencies already set out in article 54 of Regional Legislative Decree no. 15/2012/A of 2 April.

The Regional Land-Use Plan for the Azores (PROTA) and the sectoral plans that have territorial impact are binding on public bodies, which are obliged to implement the sectoral policies set down in them. Moreover, municipal plans and special land-use plans are also binding on these bodies and are directly and immediately binding on private individuals, in accordance with article 3 of the legal system governing land-management instruments in the Autonomous Region of the Azores, approved by Regional Legislative Decree no. 35/2012/A of 16 August.

D) PROGRAMMES FOR RESEARCH, MONITORING, EDUCATION AND TRAINING

▶ RESEARCH

Under the umbrella of various research and higher education programmes, mainly run by the University of the Azores, research into various subjects has been carried out on São Jorge island. Several studies of the biology and ecology of various species are currently underway, as are several ecological modelling and habitat-recovery projects, among others.

In the area of sustainability, attention should be drawn to the Green Islands project, one of the main research projects within the MIT-Portugal programme. This project is developing innovative tools for planning and using energy on the Azores with a view to identifying strategies that allow local resources to be used to satisfy energy requirements.

Owing to São Jorge's importance to the natural environment of the Azores archipelago and the North Atlantic, the proposed biosphere reserve is expected to lead to an increase in research as the island will become a laboratory for studying the implementation of integrated and sustained-management models.

▶ MONITORING

Through the bodies responsible for managing the Fajãs de São Jorge Biosphere Reserve, the Government of the Azores will provide all of the means required to assess the state of conservation of the relevant species and ecosystems and the results of any management measures that come to be implemented through specific programmes and monitoring activities.

In parallel, monitoring programmes that are planned or currently underway within the scope of the Regional Board for the Environment and the São Jorge Natural Park will continue.

▶ ENVIRONMENTAL EDUCATION AND TRAINING

The Government of the Azores is currently implementing the Regional Plan for Environmental Education and Awareness, which is run by the island's natural parks and involves the *Ecotecas* and the network of environmental centres. In this context, various environmental education actions and programmes, implemented in partnership with local authorities, schools and environmental non-governmental organisations on the island of São Jorge, have been and will continue to be carried out.

The Environmental Interpretation Centre of the Fajã da Caldeira de Santo Cristo and the House of São Jorge Park and Eco-Museum currently operate under the management of the São Jorge Natural Park. These two venues, which are open to the general public and to visitors, provide information and training and raise environmental awareness.

The recent entry into service of the São Jorge Centre for Waste Processing and Organic Composting constitutes an important step in raising the population's awareness of the need to prevent and manage waste, including the need to sort waste for recycling purposes.

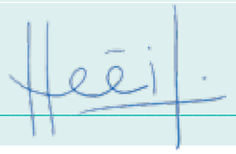
The Azores Biosphere Reserves are intended to be models of development centred on the conservation of environmental and cultural heritage. It is also hoped that the results obtained in the area of integrated resource and habitat management will have an impact on the implementation of similar measures on other islands in the region or in areas with similar characteristics.


Flora
Líquenes Lichens
Algas e Briófitos Algae an

5. ENDORSEMENTS

5.1. SIGNED BY THE AUTHORITIES IN CHARGE OF THE MANAGEMENT OF THE CORE AREAS

5.2. SIGNED BY THE AUTHORITIES IN CHARGE OF THE MANAGEMENT OF THE BUFFER ZONES

NAME	Hernâni Hélio Jorge
POSITION	Regional Director for the Environment
CONTACTS	Adress: Rua Cônsul Dabney, Colónia Alemã, Apartado 140, 9900-014 Horta, Faial, Açores E-mail: info.dra@azores.gov.pt Telephone: (+351) 292 207 300
DATE	26/08/2015
SIGNATURE	

NAME	Rui Miguel Vieira de Sequeira
POSITION	Director of the São Jorge Natural Park
CONTACTS	Adress: Rua Nova, Relvinha 9850-042 Calheta, São Jorge, Açores E-mail: parque.natural.sjorge@azores.gov.pt Telephone: (+351) 295 403 860
DATE	26/08/2015
SIGNATURE	

5.3. SIGNED AS APPROPRIATE BY THE NATIONAL (OR STATE OR PROVINCIAL) ADMINISTRATION RESPONSIBLE FOR THE MANAGEMENT OF THE CORE AREAS AND THE BUFFER ZONES

NAME	Luís Nuno da Ponte Neto de Viveiros
POSITION	Regional Secretary of Agriculture and the Environment
CONTACTS	Adress: Rua Cônsul Dabney, Colónia Alemã, Apartado 93, 9900-014 Horta, Faial, Açores E-mail: info.sraa@azores.gov.pt Telephone: (+351) 292 208 800
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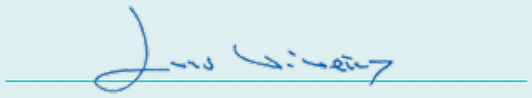
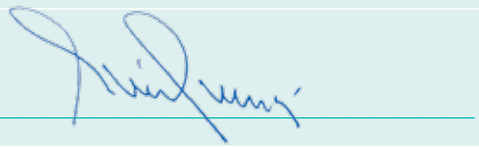
SIGNATURE	

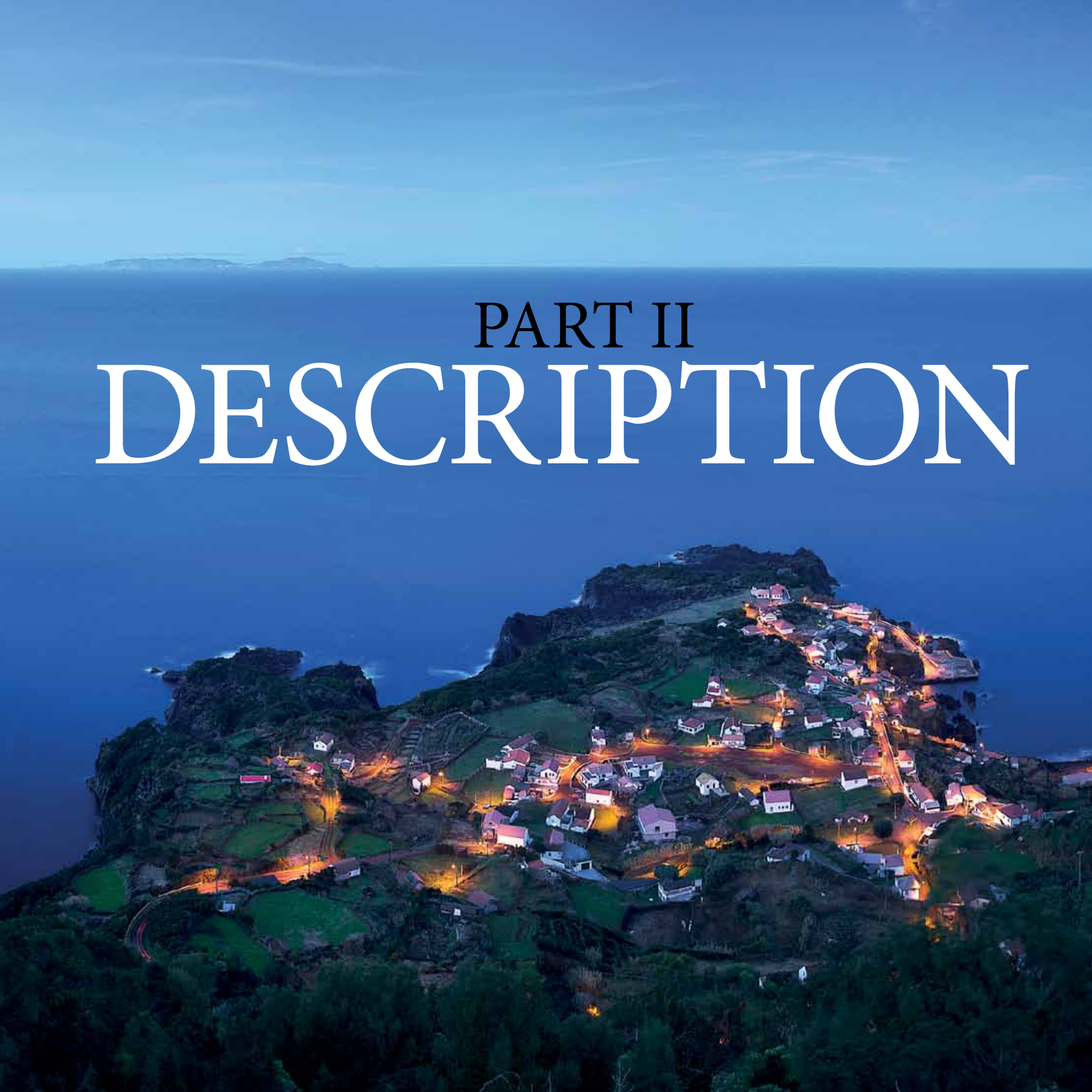
5.4. SIGNED BY THE AUTHORITIES, ELECTED LOCAL GOVERNMENT RECOGNIZED AUTHORITY OR SPOKESPERSON REPRESENTATIVE OF THE COMMUNITIES LOCATED IN THE TRANSITION AREAS

NAME	Décio Natálio Almada Pereira
POSITION	President of the Municipal Council of Calheta
CONTACTS	Adress: Rua 25 de Abril, Calheta 9850-032 Calheta, São Jorge, Açores E-mail: geral@cm-calheta.pt Telephone: (+351) 295 416 324
DATE	26/08/2015
SIGNATURE	

NAME	Luís Virgílio de Sousa da Silveira
POSITION	President of the Municipal Council of Velas
CONTACTS	Adress: Rua São João, Velas 9800-539 Velas, São Jorge, Açores E-mail: geral.m.velas@mail.telepac.pt Telephone: (+351) 295 412 214
DATE	26/08/2015
SIGNATURE	

5.5. SIGNED ON BEHALF OF THE MAB NATIONAL COMMITTEE:

NAME	Anabela Rodrigues dos Santos Trindade
POSITION	Portuguese Committee for the MAB Programme
CONTACTS	Adress: Av. da República, nº 16 a 16-B, Lisboa 1050-191 Lisboa E-mail: anabela.trindade@icnf.pt Telephone: (+351) 213 507 900
DATE	26/08/2015
SIGNATURE	



PART II
DESCRIPTION

6. LOCATION (COORDINATES AND MAPS)

The proposed Fajãs de São Jorge Biosphere Reserve is located in Portugal, more specifically in the Autonomous Region of the Azores.

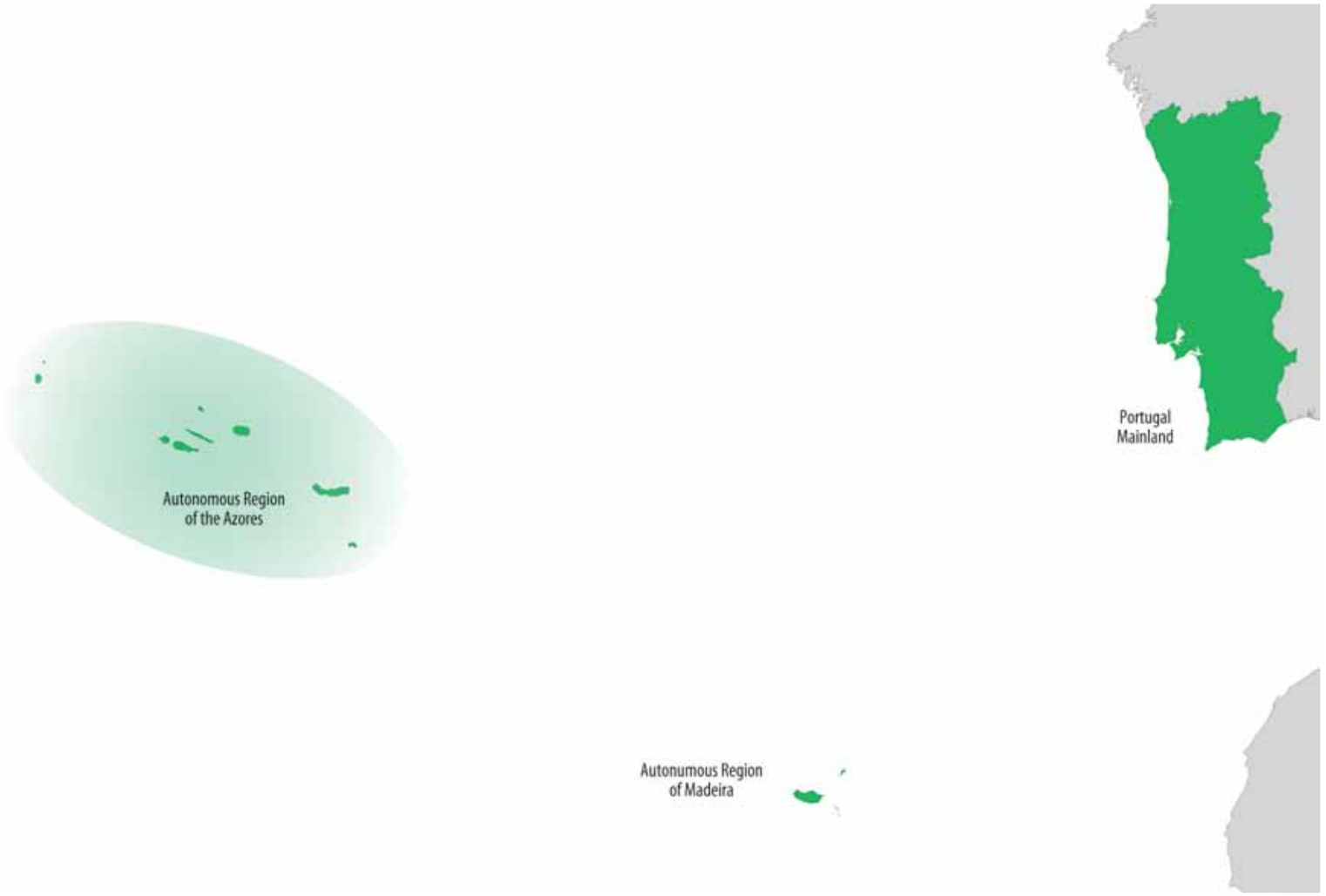


Figure 1. Location of Portugal and its Autonomous Regions

6.1. PROVIDE THE BIOSPHERE RESERVE'S STANDARD GEOGRAPHICAL COORDINATES (ALL PROJECTED UNDER WGS 84)

Table nº. 1 – Biosphere Reserve's geographical coordinates

CARDINAL POINTS	LATITUDE	LONGITUDE
Most central point	38,64127125	-28,04348815
Northernmost point	38,80675701	-28,31712189
Southernmost point	38,48329684	-27,82662959
Westernmost point	38,75593903	-28,38160341
Easternmost point	38,54772152	-27,68868045

6.2. PROVIDE A MAP(S) ON A TOPOGRAPHIC LAYER OF THE PRECISE LOCATION AND DELIMITATION OF THE THREE ZONES OF THE BIOSPHERE RESERVE

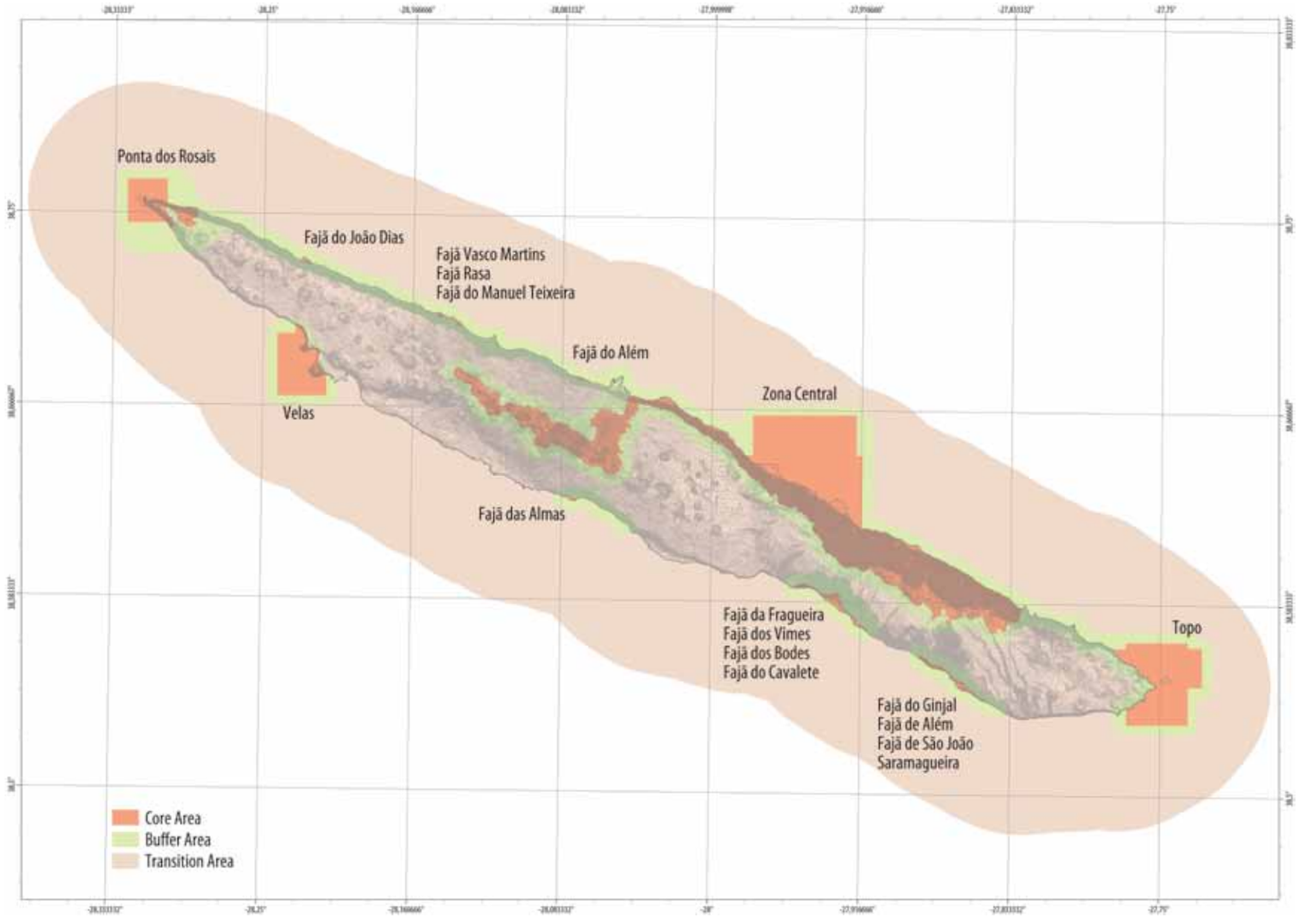


Figure 2. Zonation of the Fajãs de São Jorge Biosphere Reserve, Azores

Hyperlink to access the map on the internet: http://arcg.is/1LdK0DM

7. AREA

The Fajãs de São Jorge Biosphere Reserve occupies a total area of 98,114.17 ha, of which 24,382.77 ha are terrestrial and 73,731.40 ha are marine.

Table nº. 2 – Biosphere Reserve's areas

	Terrestrial	Marine	Total
7.1. AREA OF CORE AREAS:	4,378.83 ha	3,981.48 ha	8,360.31 ha
7.2. AREA OF BUFFER ZONES:	5,317.29 ha	5,750.29 ha	11,067.58 ha
7.3. AREA OF TRANSITION AREAS:	14,686.65 ha	63,999.63 ha	78,686.28 ha
TOTAL:	**24,382.77 ha**	**73,731.40 ha**	**98,114.17 ha**

7.4. BRIEF RATIONALE OF THIS ZONATION IN TERMS OF THE RESPECTIVE FUNCTIONS OF THE BIOSPHERE RESERVE

The zonation defined for the Fajãs de São Jorge Biosphere Reserve has taken into account the natural, social, economic and cultural characteristics of the island of São Jorge, taking as its main reference point the vulnerability of (marine, coastal and terrestrial) environments in relation to human activities and the implications of these activities for the territory.

In this respect, the legal mechanisms in force were taken into account, specifically, the established protected areas and the corresponding conservation statutes and regulations governing the compatibility of uses and the occupation of the territory. The

zonation that has been established is wholly compatible with the boundaries of the existing protected areas and the instruments governing land management, land use and the regulation of economic activities.

The decision to include the whole of the area of the island of São Jorge in the Biosphere Reserve stems from a commitment undertaken to search for and experiment with socio-economic development models whose foundations incorporate conservation and the sustainable use of natural resources, particularly biodiversity, the landscape, and water resources.

A) CORE AREAS LEGALLY CLASSIFIED CORE AREAS WITH LONG-TERM PROTECTION AIMS THAT COMPLY WITH THE CONSERVATION AIMS OF THE BIOSPHERE RESERVE AND ARE OF SUFFICIENT SIZE FOR THESE AIMS TO BE FULFILLED

The Core areas of the proposed Biosphere Reserve include two types of areas: Coastal and marine core areas and core land area.

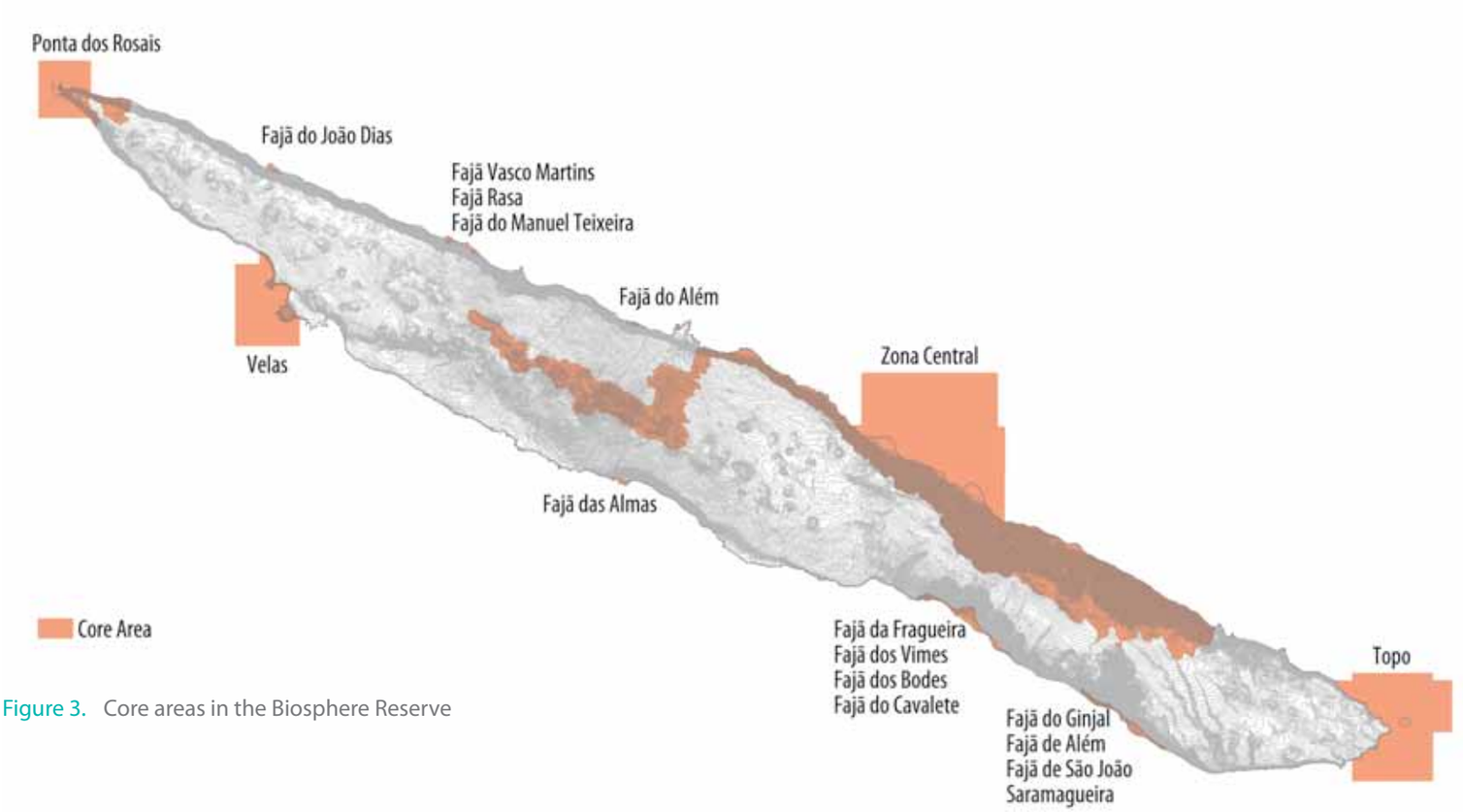


Figure 3. Core areas in the Biosphere Reserve

The **coastal and marine core areas** coincide with the protected areas within the São Jorge Natural Park, whose legal status is established by Regional Legislative Decree no. 10/2011/A of 28 March. This status includes the categories of Natural Monument, Landscape Protected Area, and Protected Area for the Management of Resources, categories which were established according to criteria proposed by the IUCN (International Union for Conservation of Nature). These core areas also include Reserve Areas for the Management of Catches, as defined in Ordinance no. 1/2014 of 10 January, and a Ramsar site.

All islands of Azores have coastal islets, many of which are classified as Protected Areas. São Jorge's main islets are listed in the following table:

Table nº. 3 - São Jorge's main islets

ISLET	EMERGED AREA (ha)	ALTITUDE (m)	STATUTORY LEGAL PROTECTION
Topo	12,1	19	APGR (SJO13)
Urzelina	0,3	<4	—
Rosais	0,5	73	APGR - West Coast (SJO10)

Owing to the need to maintain a good conservation status for certain species such as *Megabalanus azoricus* (craca), *Patella aspera* (lapa-de-fundo or lapa-brava), and *Patella candei gomesii* (lapa-mansa or lapa-da-pedra), the marine areas also coincide with the reserve areas for managing commercial or recreational catches of marine species, defined according to the legal framework for nature conservation and biodiversity protection[1]. Ordinance no. 1/2014 of 10 January standardises the provisional legal frameworks then in force, establishing four Reserve Areas for the Management of Catches on São Jorge Island: Ponta do Topo, including Topo Islet; Morro das Velas; Fajã dos Cubres / Fajã da Caldeira de Santo Cristo; and Ponta dos Rosais, including the islets.

The Coastal and Marine Core Areas are distributed across four separate areas: Rosais, Fajãs Costeiras, Entre Morros and Topo.

The **Rosais** area coincides with the limits of the following protected areas within the São Jorge Natural Park:

- The Ponta dos Rosais Natural Monument (SJO01);
- The West Coast Protected Area for the Management of Resources (SJO010);
- The Ponta dos Rosais Reserve Area for the Management of Catches.

1 Approved by Regional Legislative Decree no. 15/2012/A of 2 April.

Figure 4. Cagarros (*Calonectris borealis*) at the Natural Monument of Ponta dos Rosais

The Ponta dos Rosais Natural Monument (SJO01) consists of a land surface that occupies approximately 170 ha, including the west tip of the island and the small islets which surround it. In this area it is possible to observe some endemic plant species such as *Erica azorica* (urze), and *Myosotis marítima* (não-me-esqueças). This place, which hosts important nesting marine bird species such as *Calonectris borealis* (cagarro)[2], *Sterna hirundo* (garajau-comum), *Sterna dougallii* (garajau-rosado)[3], *Calonectris borealis* (cagarro), and *Puffinus assimilis baroli* (frulho), is considered an important bird and bird diversity area, with the "Rosais" IBA extending along the north coast to the Fajã de João Dias.

The West Coast Protected Area for the Management of Resources (SJO010) occupies a total area of 209.38 ha, with an emerged area of 0.5 ha and an altitude of 73 metres corresponding to the islet of Rosais. Located in the westernmost tip of the island, this protected marine area is characterized by a high degree of hydrodynamism as its intertidal zone contains a significant abundance of cirripedes (*Chthamalus stellatus* and *Megabalanus azoricus* - cracas). The algae community is relatively diminished in the subtidal

2 Approximately 65% of bird couples of the world population of the species *Calonectris borealis* (cagarro) nest in the Azores archipelago.

3 This species is classified on the Portuguese Red List of Vertebrates as VU (vulnerable), and as a priority species by OSPAR. It is also included in the the ICBP (International Council for Bird Preservation) world checklist of threatened birds and in Annex II of the Bern Convention.

zone due to the presence of strong currents. This coastal area is rich in pelagic carnivorous fish species (*e.g.*, *Sphyraena* viridensis - bicudas, *Seriola* dumerili - lírios, *Pomatomus saltatrix* - anchovas, *Sarda sarda* – serra, and *Katsuwonus pelamis* - bonitos). These species roam the water column in search of potential prey, which consist of shoals of small pelagic fish species (e.g. *Trachurus picturatus* - chicharros, *Pagellus bogaraveo* – carapaus, and *Boops boops* - bogas). Near the seabed there are various species of crustaceans, echinoderm, molluscs, and benthic ichthyofauna, which are very common in the overall subtidal zone of São Jorge Island. *Scyllarides latus* (cavaco), *Sphaerechinus granularis* (ouriço-do-mar), *Loligo forbesi* (lula), and *Scorpaena scrofa* (rocaz) stand out for their economic value.

This protected area is fully integrated within the boundaries of the Ponta dos Rosais Reserve Area for the Management of Catches, which include the area's islets. The coastal islets are specific habitats, authentic land enclaves in the marine area. Their rocky nature (basalt or tuff) produces intertidal and subtidal habitats which are typically rocky, usually with submerged or semi-submerged caves, often surrounded by a sedimentary bottom (sand or gravel), allowing them to be colonised by marine coastal flora and fauna. However, these areas are also important because their emerged areas serve as significant breeding grounds for many marine bird species.

The Ponta dos Rosais Natural Monument and the West Coast Protected Area for the Management of Resources incorporate the objectives and boundaries defined for the Ponta dos Rosais Special Area of Conservation (SAC), which includes 7 types of habitats listed in Annex I of the Habitats Directive, one of which is a priority habitat.

The Ponta dos Rosais SAC (PTJOR0013) is a coastal site dominated by coastal cliffs with endemic vegetation, erica heaths and pasture areas. The extraordinary power of the natural elements at this end of the island shapes the ecological uniqueness of the area, where mountain formations combine with coastal elements.

This area has the distinction of being home to a meadow of *Rumex azoricus* (labaça-das-ilhas), a protected species which forms communities in very few places. The area is also part of the "Rosais" IBA, an area extending along the north coast to the Fajã de João Dias, which is important for the protection of the bird species *Calonectris borealis* (cagarro), *Sterna hirundo* (garajau-comum), *Sterna dougallii* (garajau-rosado) and *Puffinus assimilis baroli* (frulho).

Occupying a total area of 307.08 ha, of which 140.29 ha are a marine area, this SAC contains four identified natural terrestrial habitats listed in Annex I of the Habitats Directive: *Annual vegetation of drift lines* (1210); *Perennial vegetation of stony banks* (1220); *Vegetated sea cliffs with endemic flora of the Macaronesian coasts* (1250); *Endemic macaronesian heaths* (4050)[4] – and 4 four plant species listed in Annex II of the aforementioned Directive: *Erica azorica* (urze); *Myosotis maritima* (não-me-esqueças); *Scabiosa nitens; Rumex azoricus* (labaça-das-ilhas).

In the marine area, the bottom possesses a range of typologies and substrates, including several small caves and crevices. The biotopes found there are typical of very exposed areas. The more hydrodynamic area, associated with depths of up to 5 metres, is dominated by coralline encrusting algae, with some patches of *Ulva* spp. At greater depths, *Cystoseira* sp., *Halopteris filicina*,

4 Priority habitat according to Annex I of the Habitats Directive.

Figure 5. Labaça-das-ilhas (*Rumex azoricus*)

Figure 6. Tartaruga-careta (*Caretta caretta*) and garajau-comum (*Sterna hirundo*)

Asparagopsis armata, *Litophylum* sp. can be found. As the depth increases, so does the occurrence of patches of *Padina pavonina,* which are then replaced in the deeper zones by *Zonaria tournefortii*. Large shoals of pelagic fish species (*e.g. Trachurus picturatus* - chicharros, *Pagellus bogaraveo* – carapaus, and *Boops boops* - bogas) are also common.

In these areas, the following natural marine habitats listed in Annex I of the Habitats Directive have been identified: *Large shallow inlets and bays* (1160), *Reefs* (1170), and *Submerged or partially submerged sea caves* (8330). Furthermore, the following animal species listed in Annex II of the Habitats Directive have been identified: *Tursiops truncatus* (Golfinho-roaz), and *Caretta caretta* (Tartaruga-careta), which is considered a priority species.

The species listed below, which are important either from the conservation point of view or as resources, can also be found:

- Invertebrates: *Patella aspera* (lapa-brava), *Patella candei* (lapa-mansa), *Octopus vulgaris* (polvo-comum), *Megabalanus azoricus* (craca), *Palinurus elephas* (lagosta), *Maja capensis* (santola), and *Scylarides latus* (cavaco);
- Fish: *Coryphoblennius galerita* (caboz-de-crista), *Epinephelus marginatus* (mero), *Mullus surmuletus* (salmonete), and *Phycis phycis* (abrótea);
- Birds: *Arenaria interpres* (rola-do-mar), *Calidris alba* (pilrito-das-praias), *Charadrius alexandrinus* (borrelho-de-coleira-interrompida), *Larus michahellis atlantis* (gaivota), *Larus marinus* (alcatraz-comum), *Larus ridibundus* (guincho-comum), and *Numenius phaeopous* (maçarico-galego);
- Cetaceans: *Delphinus delphis* (golfinho-comum), and *Grampus griseus* (moleiro or grampo);
- Flora: *Porphyra* sp. (erva patinha).

Figure 7. Santo Cristo da Caldeira Sanctuary

Figure 8. View of the fajãs and the lagoons of Cubres and Caldeira de Santo Cristo

The core areas that coincide with the **coastal *fajãs*** are distributed across the island and include the following *fajãs*:

- The Fajã de João Dias;
- The Fajã Vasco Martins, Fajã Rasa and Fajã do Manuel Teixeira;
- The Fajã d'Além (north coast);
- The North Coast Fajãs (from the Fajã Isabel Pereira to the Fajã do Nortezinho);
- The Fajã das Almas;
- The Fajã da Fragueira, Fajã dos Vimes, Fajã dos Bodes and Fajã do Cavalete;
- The Fajã do Gingal, Fajã de Além (south coast), and Fajã de São João e Saramagueira.

These core coastal areas have been defined in accordance with their importance in terms of landscape conservation and protection. They include sites that are of particular conservational relevance because they belong to protected parts of the São Jorge Natural Park and to SCAs, SPAs and IBAs. Their cultural importance and built and classified heritage have also been taken into account.

These areas correspond to places associated with their natural and cultural use. They contain classified and inventoried buildings and are characterised as spaces that play an important role in the conservation of resources and of the natural and landscape heritage.

The Fajã de João Dias, Fajã Vasco Martins, Fajã Rasa and Fajã do Manuel Teixeira are located in the protected area defined within the São Jorge Natural Park, which has been designated a Protected Area for the Management of Habitats and Species of the North-West Coast (SJO02). The Fajã das Almas is adjacent to the Protected Area for the Management of Habitats and Species of the Fajã das Almas (SJO06).

The Fajã Isabel Pereira, Fajã Ribeira d'Areia, Fajã Chã, Fajã dos Azevinhos, Fajã do Mero, Fajã da Abelheira, Fajã das Funduras, Fajã da Penedia, Fajã das Pontas, Fajã da Neca, Fajã da Betesga, Fajã dos Cubres, Fajã do Belo, Fajã dos Tijolos, Fajã da Caldeira de Santo Cristo, Fajã Redonda, Fajã do Sanguinhal, Fajã de Entre Ribeiras, Fajã de Salto Verde, Fajã do Norte das Fajãs, Fajã da Ribeira

Figure 9. Amêijoas (*Ruditapes decussatus*) from the Caldeira de Santo Cristo lagoon

Figure 10. Mero (*Epinephelus marginatus*)

Funda, Fajã do Norte Estreito and Fajã do Nortezinho coincide with the Special Protected Landscape of the Northern Fajãs (SJO09), occupying an area of around 2926 ha. This protected area includes a large number of *fajãs* and their hillsides, establishing a link with the Protected Area of the Pico da Esperança and the Central Plateau. This area is noted for the harmonious interaction between its natural and cultural features, as expressed in the landscape and in traditional uses, building practices, and social and cultural events.

The areas of this group which are most noteworthy, particularly due to their lagoons, are the Fajã dos Cubres and the Fajã da Caldeira de Santo Cristo, which are within the boundaries of various classified areas such as the Protected Landscape Area of the Fajãs do Norte (SJO09), the Protected Area for the Management of the Resources of Fajã Coasts (SJO12), the Reserved Area for the Management of Catches of the Fajã dos Cubres / Fajã da Caldeira de Santo Cristo, and the North-East Coast and Ponta do Topo SPA. These areas are also classified as RAMSAR sites.

In fact, the view of these *fajãs* and their lagoons is one of the most striking that can be found on São Jorge island. Although they are very close to each other, these lagoons function differently: the lagoon of the Fajã da Caldeira de Santo Cristo is linked to the sea by a channel and is affected by tides while the lagoon of the Fajã dos Cubres can only communicate with the ocean by means of percolation. These lagoon systems are unique in the Azores and offer shelter to various migratory and nesting species such as the *Ardea cinerea* (garça-real), the *Numenius phaeopus* (maçarico-galego), the *Sterna hirundo* (garajau-comum) and the *Calonectris borealis* (cagarro).

Furthermore, the lagoon of the Fajã da Caldeira de Santo Cristo is the only one in the Azores where clams (*Ruditapes decussatus*) can be found. Despite being an introduced species, clams are highly appreciated and form part of the local cuisine. Several licensed catchers exploit them commercially.

The muddy interior of the lagoon is home to a range of species of macroalgae and communities of invertebrates (sponges, hydra, anemones, bryozoa, sipuncula, bivalvia, gastropoda, annelids, crustaceans, echinoderms). It contains species that are important from the conservation point of view than the amêijoa-boa. In the waters and depths of the lagoon there are around twenty species of coastal

fish, particularly juveniles, which use the lagoon as a place in which to grow. Such species include *Epinephelus marginatus* (mero).

Various species of resident or migratory seabirds that feed from the waters of the lagoon can be observed in it, including *Larus michahellis atlantis* (gaivotas), *Sterna dougallii* (garajau-rosado) and *Sterna hirundo* (garajau-comum). On the banks it is possible to observe the *Charadrius hiaticula* and *Charadrius semipalmatus* (borrelhos); *Calidris alba*, *C. fuscicollis* and *C. Malanotus* (pilritos); 1x); *Numenius phaeopus* and *Limosa limosa* (maçaricos); *Egretta garzetta* (garça-branca); and the *Ardea cinerea* (garça-real). The *Calonectris borealis* (cagarro) nests on the coastal cliffs of the *fajã* but feeds on the open sea[5].

This area is accessible via the Serra do Topo / Fajã da Caldeira de Santo Cristo / Fajã dos Cubres footpath, the most important footpath on São Jorge island, which begins in the Serra do Topo at an altitude of around 700 metres and finishes at sea level, allowing walkers not only to appreciate a wide range of plant species at close hand but also to see how altitude affects flora. In the high areas where the path begins, one of the most interesting plant communities in the Azores can be found, the afforested peat bogs that are home to the Azores juniper (*Juniperus brevifolia*). A little lower down it is possible to observe a large community of ferns, the most noteworthy of which are endemic species such as *Polypodium azoricum* (polipódio), *Asplenium azoricum* or *Dryopteris azorica*. Further down still lies an area in which the vegetation is dominated by woody plants such as *Daboecia azorica (*queiró), *Erica azorica* (urze), *Juniperus brevifolia* (cedro-do-mato), and *Vaccinium cylindraceum* (uva-da-serra). Finally, at the lowest level, coastal plants such as *Azorina vidalii* (vidália) and *Spergularia azorica* can be observed.

The Fajã dos Cubres [Fajã of the Seaside Goldenrod], so-called because the yellow-flowered plant is found in abundance at the site, also possesses a coastal lagoon, albeit a brackish-water one, which probably represents a more advanced stage in the natural evolution of coastal lagoons. The lagoon is isolated from the sea by a barrier of stony banks and is not linked to the ocean by a channel. Thus fresh water from the rain and run-off from the land play a large part in shaping this habitat. The elongated orientation of the lagoon, which runs from east to west, and the presence of a central islet to which a footbridge has been constructed, have caused the salinity of the lagoon to become highly stratified, both length and depth-wise. Thus, the eastern side is essentially fresh water while the western side is essentially brackish, with the highest salinity level found near the bottom (max. 26‰) and the lowest at the surface (10-18‰)[6]. A thick layer of sediments resulting from the deposition and decomposition of organic matter lies across the whole of the bed of the lagoon. One of the most interesting aspects of this lagoon is that it is home to populations of the only marine vascular plant to have been recorded in the Azores, rupia (*Ruppia maritima*), which grows in areas containing green filamentous algae (*Entermorpha* sp.) and other species of lake flora.

The marine part of the lagoon is noted for its dense populations of *Palaemon adspersus* (camarões das poças), among other invertebrates (polychaetes, amphipoda and isopoda). In contrast to Fajã da Caldeira de Santo Cristo lagoon it contains few fish species due to the low salinity levels. Thus, only the *Chelon labrosus* (tainhas) and the *Trachinotus ovatus* (prombetas) can survive in the lagoon, albeit sporadically and in small numbers.

5 Adapted from Morton *et al.*, 1998, Partidário & Ferreira, 2005.

6 Morton *et al.*, 1998.

Figure 11. Fajã dos Cubres lagoon

Figure 12. Fajã da Caldeira de Santo Cristo lagoon

Owing to the abundance of invertebrates, various species of terrestrial and marine birds feed and nest on the banks of the lagoon. The former group includes various species of domestic and wild ducks (e.g. *Anas platyrhynchos* and *Anas crecca*) and *Gallinula chloropus* (galinholas-de-água). The marine birds include the *Larus michahellis atlantis* (gaivota-de-patas-amarelas), the *Charadrius alexandrinus* (borrelho-de-coleira-interrompida), the *C. melanotos* (pilrito-de-colete), the *Arenaria interpres* (rolas-do-mar), the *Numenius phaeopus (maçarico-galego)* and *Limosa limosa* (maçarico-de-bico-direito), the *Egretta garzetta* (garça-branca) and the *Ardea cinerea* (garça-real). The *Sterna dougallii* (garajau-rosado) and *Sterna hirundo* (garajau-comum) feed in the waters of the lagoon and nest on its banks while the *Calonectris borealis* (cagarro) nests on the coastal cliffs of the *fajã* and feeds on the open sea[7].

The Fajã dos Cubres and its lagoon form part of the protected areas of the São Jorge Natural Park, specifically the Protected Landscape Area of the Fajãs do Norte (SJO09) and the Protected Area for the Management of the Natural Resources of the Fajã Coasts (SJO12). It is also classified as a Ramsar Site.

The wetlands of the Caldeira de Santo Cristo and Cubres Fajãs contain habitats that are listed in Annex I of the Habitats Directive. These areas provide unique and essential living conditions for endemic and migratory species such as: *Coastal lagoons* (1150 - priority

7 Adapted from Morton *et al.*, 1998.

habitat), *Large shallow inlets and bays* (1160), *Mediterranean salt meadows* (1410) and *Endemic macaronesian heaths* (4050 - priority habitat). The existing lagoon systems are unique or rare examples in the Azores and in the bio-geographical region of Macaronesia.

The Protected Area for the Management of the Resources of the Fajã Coasts (SJO12) occupies a total area of 876.22 ha and partially coincides with the Reserved Area for the Management of Catches of the Fajã dos Cubres / Fajã da Caldeira de Santo Cristo.

The coastline of this protected marine area is characterized by reefs and sandbanks formed by basalt deposits from the slope of the Serra do Topo volcano complex. This area is characterized by frequent, striking ocean-wave activity. Clear zonation characterized by unequal distribution of the algal substrate and of some species of marine invertebrates can be observed in the intertidal zone. The upper strip of the intertidal zone is dominated by lichen, cyanobacteria and gastropoda (e.g. lapas – *Patella aspera* and *Patella candei gomesii*). At a lower level, different bands of algae appear, namely, coralline algae such as *Corallina sp.* and *Jania sp.,* as well as barnacles (cracas - *Megabalanus azoricus*). The exotic alga *Asparagopsis armata* appears on the lower boundary of the intertidal zone and in the subtidal zone. The ichthyofauna is similar in every respect to that found around the whole of São Jorge island. In terms of ecological value, however, the most important species is the *Symphodus caeroleus* (bodião-azul), a species that is endemic to the Azores. The lagoon area is an important 'maternity ward' for *Epinephelus marginatus* (meros), allowing this species to exist in abundance in adjacent areas.

The **Entre Morros** area coincides with the limits of the following protected areas within the São Jorge Natural Park:

- The Entre Morros Protected Area for the Management of Resources (SJO11);
- The Morro das Velas Reserved Area for the Management of Catches;
- The Protected Area for the Management of Habitats or Species of the South-West Coast (SJO03).

The Entre Morros Protected Area for the Management of Resources (SJO11) occupies a total marine area of 246.52 ha and coincides with the Morro das Velas Reserved Area for the Management of Catches.

The Protected Area for the Management of Habitats and Species of the South-West Coast (SJO03) borders the Entre Morros Protected Area for the Management of Resources and is an important bird and bird diversity area (IBA).

This protected marine area is notable for a striking islet located near the side of the hill to the north-west. This islet rises to a height of around 30 metres above the water and descends to a depth of 10 metres. The emersed area provides migratory marine birds with a safe point for resting, reproducing and nesting.

The *Gymnothorax unicolor*, *Muraena helena*, *Muraena augusti* (moreias), *Apogon imbersis* (foliões) and *Octopus vulgaris* (polvos) use the crevices of this islet as a shelter while the water column near the vertical cliff face is home to an abundance of *Sarpa salpa* (salemas), *Diplodus sargus* (sargos), *Chromis limbata* and *Abudefduf luridus* (castanhetas). The submerged area of the sheltered bay to which this marine area belongs is characterised by the presence of large blocks of basalt rock. The sandy substrate reaches the 20-metre bathymetric line. The following species predominate on the sandy bottom: *Mullus surmulltus* (salmonete), *Bothus podas maderensis* (solha), *Synodus saurus* (peixe lagarto) and occasionally *Dasyatis pastinaca* (ratão).

Figure 13. The Entre Morros area, Velas

Figure 14. Topo Islet

The **Topo** area coincides with the limits of the following protected areas within the São Jorge Natural Park:

- The Protected Area for the Management of Habitats and Species on the Islet of Topo (SJO08);
- The Protected Area for the Management of Resources on Topo (SJO13);
- The Reserved Area for the Management of Catches in Ponta do Topo, including the islet of Topo.

These areas are included in the territorial boundaries and aims defined for the North-West Coast and Ponta do Topo SCA and the Islet of Topo and Adjacent Coast SPA.

The Protected Area for the Management of Resources of Topo (SJO13) occupies a total area of 609.78 ha, with the emersed area of the Islet of Topo occupying 12.1 ha and rising to a height of 19 metres. This protected area partially coincides with the Reserve Area for the Management of Catches in Ponta do Topo, including the Islet of Topo.

The Islet of Topo is a protected zone that has been designated the Protected Area for the Management of Habitats or Species of the Islet of Topo (SJO08). Owing to the small size and isolation of this area of land, it is floristically poor although *Festuca petraea* (bracel-da-rocha) can easily be observed. However, marine birds such as *Calonectris borealis* (cagarro), *Sterna hirundo* (garajau-comum) and *Sterna dougallii* (garajau-rosado) are frequently seen on this islet, granting it important bird and bird diversity area (IBA) status.

In the rocky parts of this protected marine area (which include rocky beds, blocks and walls), the most common and abundant coastal fish species are *Abudefduf luridus* (castanheta-azul), the *Symphodus caeruleos* (bodião-verde), *Chromis limbata*

(castanheta-castanha), the *Coris julis* (peixe-rei), *Diplodus sargus* (sargo), the *Labrus bergylta* (bodião-vermelho), *Sarpa salpa* (salema), *Scorpaena maderensis* (rascasso), the *Serranus atricauda* (garoupa), *Sparisoma cretense* (veja), the *Thalassoma pavo* (rainha), *Sphoeroides marmoratus* (sopapo), and *Trypterygion delaisi delaisi* (caboz-de-três-dorsais). To the north of the Islet of Topo there are several blocks of basalt rock that descend to depths of between 15 and 25 metres. This topography, which favours strong currents, makes this site ideal for pelagic fish (e.g. *Sphyraena viridensis* – bicudas and *Pseudocaranx dentex* - encharéus). In addition to the aforementioned species, the lower depths, close to the islet and between the basalt corridors, are home to exceptional numbers of *Epinephelus marginatus* (meros), *Mycteroperca fusca* (badejos), and large colourful *Bodianus scrofa* (peixes-cão). Near the south coast of the Islet of Topo, at depths of between 5 and 10 metres, there are blocks of rock covered in *Megabalanus azoricus* (cracas) and *Arbacia lixula e Paracentrotus lividus* (ouriços-do-mar).

This zone is included in the territorial boundaries of the North-West Coast and Ponta do Topo SCA (PTJOR0014) and also the Islet of Topo and Adjacent Coast SPA (PTZPE0028). This SCA, which occupies a total area of 3,965.15 ha (389.30 ha of which is a marine area), is home to many elements listed on the Habitats Directive, such as: Natural land and sea habitats listed in Annex I of the Directive – *Annual vegetation of drift lines* (1210), *Perennial vegetation of stony banks* (1220), *Vegetated sea cliffs with endemic flora of the Macaronesian coasts* (1250), *Endemic Macaronesian heaths* (4050), *Large shallow inlets and bays* (1160), *Reefs* (1170), and *Submerged or partially submerged caves* (8330) – and flora and fauna listed in Annex II of the same Directive – *Ammi trifolatum* (pé-de-pomba), *Azorina vidalii* (vidália), *Spergularia azorica*, *Scabiosa nitens*, *Erica azorica* (urze), *Rumex azoricus* (labaça-das-ilhas), *Tursiops truncatus* (Golfinho-roaz), and *Caretta caretta* (Tartaruga-careta).

The species listed below, which are important either from the conservation point of view or as resources, can also be found:

- Invertebrates: *Patella aspera* (Lapa brava), *Patella candei* (Lapa mansa), *Octopus vulgaris* (Polvo-comum), *Megabalanus azoricus* (Craca), *Ruditapes decussatus* (Amêijoa-boa), *Palinurus elephas* (Lagosta), *Maja capensis* (Santola) e *Scyllarides latus* (Cavaco);
- Fish: *Epinephelus marginatus* (Mero), *Mycteroperca fusca* (Badejo), *Pagellus bogaraveo* (Carapau quando juvenil), *Mullus surmuletus* (Salmonete), *Parablennius ruber* (Caboz-lusitano), *Lipophrys pholis* (Caboz-gigante), *Phycis phycis* (Abrótea), *Gobius paganellus* (Bochecha), *Gaidropsarus guttatus* (Viúva), *Pagrus pagrus* (Pargo), *Coryphoblennius galerita* (Caboz-de-crista), *Lipophrys trigloides* (Caboz), *Parablennius incognitus* (Caboz-das-cracas), *Diplecogaster bimaculata pectoralis* (Peixe-ventosa-dos-ouriços),
- Flora: *Porphyra* sp. (Erva patinha).

The coastal part of this SCA is also home to species of marine birds such as *Calonectris borealis* (cagarro), *Sterna dougallii* (garajau-rosado), *Sterna hirundo* (garajau-comum) and various terrestrial birds, including *Columba palumbus azoricus* (pombo-torcaz-dos-Açores).

Figure 15. Pico da Esperança

The **core land area** coincides with a protected elevated area defined within the São Jorge Natural Park, specifically, the Protected Area for the Management of Habitats or Species of Pico da Esperança and the Central Plateau and the geo-site of the Central Volcanic Range. This area is also classified as an internationally important wetland in the context of the RAMSAR Convention.

Its territory is continuous with the Protected Landscape Area of the Northern Fajãs, which is included in the Core Coastal and Marine Area of Cubres and Caldeira de Santo Cristo and also includes part of the North-West Coast and Ponta do Topo Special Area of Conservation (PTJOR0014), which contains many of the habitats listed on the Habitats Directive annexes.

This is one of the richest biological areas, where certain rare species such as *Chaerophyllum azoricum* and *Ammi trifoliatum* can be found. This site is also home to a great diversity of habitats that are largely in their natural states, including *Blanket bogs (active bogs), Endemic forests with juniperus* and *Macaronesian mesophile grasslands.*

The Protected Area for the Management of Habitats and Species of Pico da Esperança and the Central Plateau (SJO05) occupies an area of 1,087.22 ha and is approximately located in the centre of the island, covering the highest point of the island, the Pico da Esperança, which rises to a height of around 1053 metres. From here it is possible to observe the alignment of the volcanic cones that traverse the island from one end to the other in an east-west direction. Owing to its relief, altitude and difficulty of access, this site is well preserved and can be considered a privileged habitat for fauna. In fact, this is the only place in the world where it is possible to observe species of arthropods such as *Trechus jorgensis*, *Trechus isabelaei* and *Cheiracanthium jorgeense. Gallinago gallinago* (narceja) is the best represented species of avifauna in this site, which also hosts some migratory birds. Where flora is concerned, significant numbers of native and endemic species can be found, including the following representatives of Macaronesian mesophile grassland

Figure 16. Central Plateau of São Jorge

habitats (6180): *Leontodon filii* (patalugo-maior), *Tolpis azorica, Erica azorica* (urze), *Hypericum foliosum* (furalha), *Potentilla anglica, Huperzia dentata, Osmunda regalis (*feto-real), *Calluna vulgaris* (rapa), *Blechnum spicant* e *Holcus rigidus*.

Rare vascular plants such as *Chaerophyllum azoricum, Euphrasia grandiflora, Scabiosa nitens, Rumex azoricus* (labaça-das-ilhas), *Platanthera pollostantha* and *Platanthera micrantha* (conchelo-do-mato) are also common in this area, which is the only known place in the world where it is possible to find *Platanthera azorica*, the rarest orchid in Europe.

Some of these species would not be able to exist without the bogs found on this site. In fact, it was the water conditions and the diversity of endemic and native plants, dominated by *Sphagnum spp.* (esfagno), that led this area of the island to be classified as a RAMSAR Site – Central Plateau of São Jorge (Pico da Esperança).

Eleven natural terrestrial habitats listed in Annex I of the Habitats Directive have been identified for this site: *Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea* (3130), *Natural dystrophic lakes and ponds* (3160), *Endemic macaronesian heaths* (4050)*, *Thermo-Mediterranean and pre-desert scrub* (5330), *Macaronesian mesophile grasslands* (6180), *Active raised bogs* (7110), *Degraded raised bogs still capable of natural regeneration* (7120), *Blanket bogs (if active bog)* (7130), *Caves not open to the public* (8310), *Macaronesian laurel forests (Laurus, Ocotea)* (9360), *Endemic forests with Juniperus spp.* (9560) – and 15 species of flowers can be found that are protected by the same Directive – *Ammi trifoliatum* (pé-de-pomba), *Arceuthobium azoricum* (espigos-de-cedro), *Chaerophyllum azoricum*, *Culcita macrocarpa* (feto-do-cabelinho), *Erica azorica* (urze), *Euphorbia stygiana* (trovisco-macho), *Euphrasia grandiflora*, *Frangula azorica* (sanguinho), *Isoetes azorica*, *Prunus azorica* (ginja), *Rumex azoricus* (labaça-das-ilhas), *Sanicula azorica* (erva-do-capitão), *Scabiosa nitens*, *Trichomanes speciosum*, and *Woodwardia radicans* (feto-do-botão).

B) BUFFER ZONES — CLEARLY IDENTIFIED ZONES THAT SURROUND OR ARE ADJACENT TO CORE AREAS IN WHICH THE COMPLEMENTARY ACTIVITIES TO BE CARRIED OUT MUST BE COMPATIBLE WITH CONSERVATION AIMS

The Buffer Zones for the proposed Biosphere Reserve are areas whose size and legal status allow them to complement core areas in respect of nature conservation and biodiversity. These zones have been defined in accordance with their prior established legal status and with topographic and functional aspects that provide functional continuity between these zones and core and transition areas.

In general terms, the proposed buffer zones are characterised by possessing a good environmental state in which the presence of ecologically valuable and representative habitats and species is registered. From the point of view of human activity, buffer zones are characterised by low population densities and by the existence of some agricultural and fishing activity as well as small-scale fishing in coastal and marine areas. These areas are also associated with some regulated, low-impact tourism activity that is always practised in a way that respects the environment.

The buffer zones of the Fajãs de São Jorge Biosphere Reserve occupy a total area of 11,067.58 ha, of which 5,317.29 ha are terrestrial and 5,750.29 ha are marine. These zones include protected areas that form part of the São Jorge Natural Park and are classed as Protected Areas for the Management of Habitats or Species and for the Management of Resources, specifically:

- Protected Area for the Management of Habitats and Species of the North-West Coast (SJO02);
- Protected Area for the Management of Habitats and Species of the Fajã das Almas (SJO06);
- Protected Area for the Management of Habitats and Species of the South-West Coast (SJO03);
- Protected Area for the Management of Habitats and Species of the Topo Coast (SJO07);
- Protected Area for the Management of the Resources of Topo (SJO13).

The Protected Area for the Management of Habitats or Species of the North-West Coast (SJO02) occupies an area of around 701 ha, starting from the end of the protected area of the Natural Monument of Ponta dos Rosais and extending along the north coast to Ribeira da Fonte, to the east of the Fajã da Ponta Furada.

This area is home to certain types of vegetation that are endemic to the Azores, such as *Picconia azorica* (pau-branco) and *Erica azorica* (urze). Where fauna is concerned, the area is chiefly known for *Columba palumbus azorica* (pombo-torcaz-dos-Açores) and some marine birds such as *Calonectris borealis* (cagarro) and *Sterna hirundo* (garajau-comum) nest here. For this reason, it is classed as an important bird and bird diversity area (IBA).

The Protected Area for the Management of Habitats or Species of the South-West Coast (SJO03) occupies an area of 207.2 ha, beginning in the most westerly part of the Morro Grande das Velas and extending along the south of the island to the boundary of

Figure 17. Buffer zones of the proposed biosphere reserve

the protected area of the Natural Monument of Ponta dos Rosais. This area is also important for birds (IBA) as it is a nesting site for *Sterna hirundo* (garajau-comum) and *Calonectris borealis* (cagarro). Where flora is concerned, the area is chiefly noted for species such as *Picconia azorica* (pau-branco), *Erica azorica* (urze) and *Myosotis maritima* (não-me-esqueças).

The Protected Area for the Management of Habitats or Species of the Fajã das Almas (SJO06) occupies an area of around 97 ha of the island, including the hillside of the Fajã das Almas. Being a coastal area, it is often inhabited by marine birds such as *Calonectris borealis (*cagarro) and *Sterna hirundo* (garajau-comum), making it an important bird and bird diversity area (IBA). Species such as *Erica azorica* (urze), *Picconia azorica* (pau-branco) and *Morella faya* (faia) are only some of the examples of flora that can be found in this area.

The Protected Area for the Management of Habitats or Species of the Topo Coast (SJO07) occupies a land area of around 387.8 ha, bounded by the Funda River and the Lixívias River. This area is classed as an important bird and bird diversity area (IBA) due to the diversity of birds that nest on this coast, which include *Sterna dougallii* (garajau-rosado) and *Sterna hirundo* (garajau-comum). Where flora is concerned, the area is home to a great diversity of species, such as *Azorina vidalii* (vidália), *Euphorbia stygiana* (trovisco-macho) and *Juniperus brevifolia* (cedro-do-mato).

This Protected Area incorporates the objectives defined for the Islet of Topo SPA and also for the North-East Coast and Ponta do Topo SCA since it partially coincides with their boundaries.

The Islet of Topo and Adjacent Coast SPA (PTZPE0028), which occupies 369.75 ha, includes the range of coastal cliffs between the Cabeço da Cruz river and the Fajã do Nortezinho and the coastal islets. This area contains a significantly diverse range of priority marine birds listed in Annex I of the Birds Directive. This is particularly true of the Islet of Topo, which is a nesting site for *Sterna dougallii* (garajau-rosado), *Sterna hirundo* (garajau-comum), *Puffinus assimilis baroli* (frulho), *Hydrobates castro* (painho) and *Calonectris borealis* (cagarro).

The natural terrestrial habitats listed in Annex I of the Habitats Directive that can be found in the aforementioned SPE are the following: *Annual vegetation of drift lines* (1210), *Perennial vegetation of stony banks* (1220), *Vegetated sea cliffs with endemic flora of the Macaronesian coasts* (1250) and *Endemic macaronesian heaths* (4050), which is considered a priority habitat. In turn, the natural marine habitats listed in Annex I of the Habitats Directive that can be found in this SPA are: *Large shallow inlets and bays* (1160), *Reefs* (1170) and *Submerged or partially submerged sea caves* (8330).

The area covered by the SPA and the surrounding area are home to 6 identified species of flora listed in Annex II of the Habitats Directive, namely: *Ammi trifolatum* (pé-de-pomba), *Azorina vidalii* (vidália), *Spergularia azorica*, *Scabiosa nitens*, *Erica azorica* (urze) e *Rumex azoricus* (labaça-das-ilhas). *Nyctalus azoreum* (morcego-dos-Açores)[8], the only mammal that is endemic to the Azores, as well as the bird subspecies *Columba palumbus azoricus* (pombo-torcaz-dos-Açores), are evenly distributed within this SPA.

8 This species is classified as an endangered species (CE - critically endangered) according to the Portuguese Red List of Vertebrates.

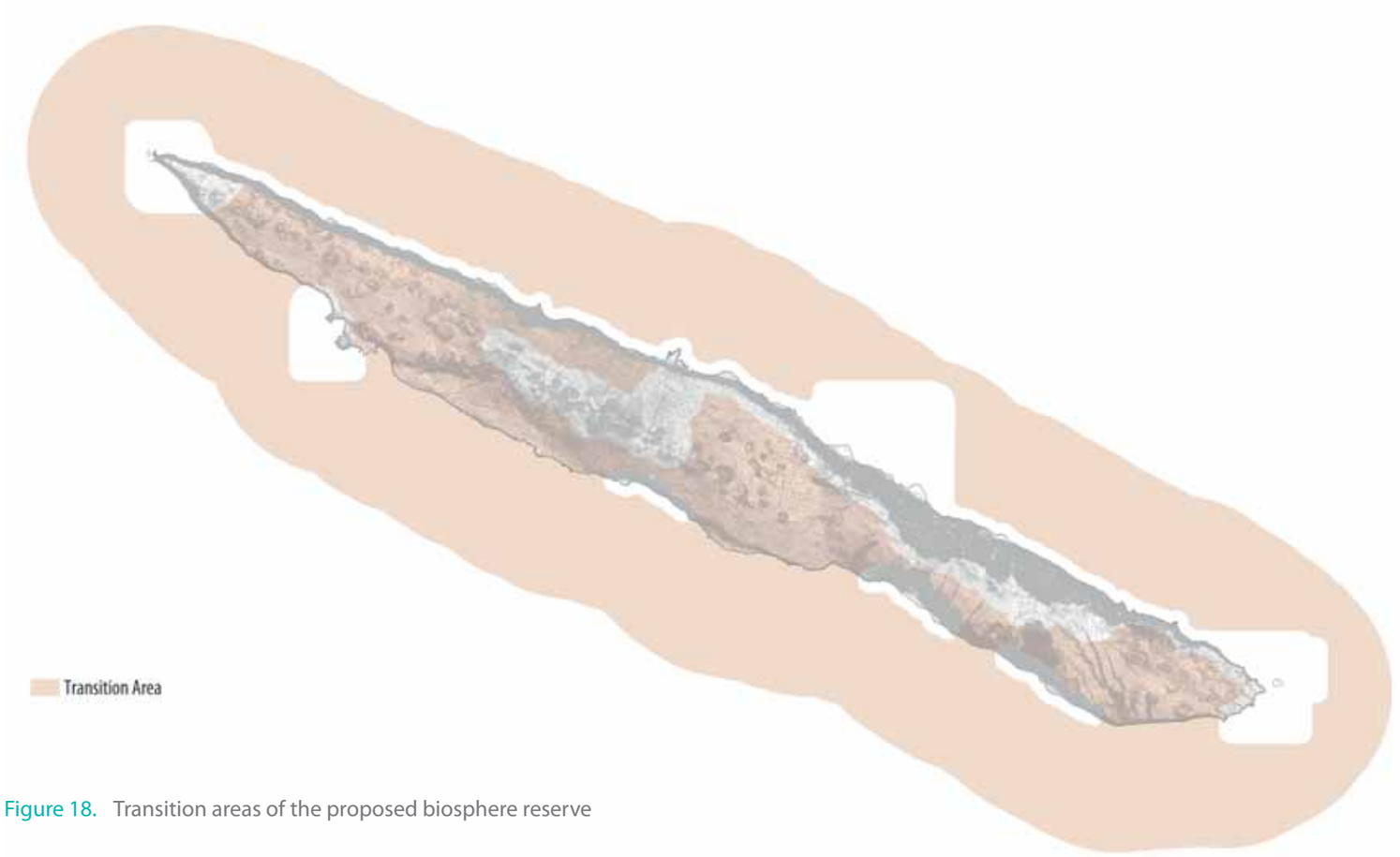


Figure 18. Transition areas of the proposed biosphere reserve

C) TRANSITION AREAS

In the proposal for the Biosphere Reserve, two types of Transition Areas are considered: a terrestrial transition area and a marine transition area.

The terrestrial transition area corresponds to the entirety of the remaining emersed territory of the island of São Jorge that is not included within the Core Area and Buffer Zones, occupying a total area of 14,686.65 ha. This area is where the main human settlements are found and where most socio-economic activities are carried out. This zone has a strong rural presence and is noteworthy for its agricultural landscapes.

Given the present growth of the population, pressure from human activities is not expected to increase to the extent that it would threaten the conservation of the natural values underlying this Biosphere Reserve nomination and the implementation of sustainable development measures in local communities.

The marine transition area corresponds to an area surrounding the island of São Jorge delimited by a distance of 3 miles in relation to the coastline, corresponding to the legally restricted fishing zone.

Owing to the limited extension of the insular platform of the island of São Jorge, the marine transition area is characterised by its quite steep slope, which reaches bathymetric depths of over 1,000 metres. This marine transition strip includes a multiplicity of coastal, oceanic, pelagic and benthic habitats that are home to a wide range of marine animals with different ecological affinities. In the rocky marine depths of the underwater slopes of the island, coral, anemones, hydrozoa and cold-water sponges shape benthic habitats that are home to vagile invertebrates (molluscs, crustaceans, echinoderms etc.) and diverse demersal fish (e.g., *Conger conger* - congro, *Pagellus bogaraveo* - goraz, *Phycis phycis* – abrótea, *Helicolenus dactylopterus* – boca-negra, or macrourídeos, among other species). The deep ocean currents carry nutrients and bathypelagic mesofauna (fish, squid, crustaceans and gelatinous organisms), which accumulate on the slopes of the islands. Near the bottom, these organisms constitute important prey for carnivorous demersal fish, their high density attracting large pelagic predators such as cetaceans and birds, which seek food there.

Groups of female and juvenile *Physeter macrocephalus* (cachalote) are regularly seen in this area, feeding on deep-water cephalopods. In spring and autumn, there are occasional sightings of baleen whales (*Baleanoptera musculus* – baleia-azul; *Baleanoptera physalus* – baleia comum; *Baleanoptera borealis* – baleia-sardinheira; *Megaptera novaeangliae* – baleia-de-bossas), filtering plankton over the slopes of the island.

The slopes of the islands are ecosystems in which the oceanic environment penetrates the coastal environments. In low-lying coastal and oceanic areas the interaction between these two types of fauna is more intense. In these habitats, marine turtles, ocean sharks and manta rays intermingle with small coastal fish, black coral and other coastal organisms. On the coastal strips, rocky benthic habitats are characterized by algae communities that house a great diversity of invertebrates. The fish that typically occur in this area include species such as *Abudefduf luridus* (castanheta-azul), *Chromis limbata* (castanheta-castanha), *Coris julis* (peixe-rei), *Thalassoma pavo* (rainhas), *Diplodus sargus* (sargo), *Sarpa salpa* (salema), *Scorpaena maderensis* (rascasso), and *Serranus atricauda* (garoupa), among others. Pelagic fish species include *Trachurus* picturatus (chicharro), *Sardina* pilchardus (sardinhas) and *Pagellus bogaraveo* (carapau), which serve as food for so-called 'blue fish' (e.g., *Sphyraena viridensis* – bicudas, *Sarda sarda* – serras, *Seriola spp.* – lírios, and *Katsuwonus pelamis* – bonitos, among others).

A great potential exists in this zone for promoting sustainable development approaches based on the work that is being or will be carried out in existing classified areas. The designation of the Fajãs de São Jorge Biosphere Reserve would support this growth by offering a clear validation of its existing natural and cultural heritage.

8. BIOGEOGRAPHICAL REGION

Through the Habitats Directive and the implementation of the Natura 2000 Network, the European Union has designated nine biogeographical regions. The Azores archipelago, and therefore the Fajãs de São Jorge Biosphere Reserve, are located in the Macaronesian region.

The biogeographical region of Macaronesia is known to contain several biodiversity hotspots which are home to over 5,300 endemic species. The island of São Jorge is a biodiversity landmark in itself in which 185 endemic terrestrial *taxa*, distributed across the whole of the island, have been registered.

In this context, the island of São Jorge Biosphere Reserve undertakes the same management, protection and conservation commitments as the whole of the Macaronesian region, in accordance with the various management and conservation instruments in force.

The term Macaronesia was first used in 1830 by the English geologist and botanist Philip Barker-Webb to refer to a biogeographical area comprising the archipelagos of the Azores, Madeira, the Canary Islands, and Cape Verde in accordance with the richness and uniqueness of their botanical resources.

The geographical extension of this region has now been extended to cover a continental enclave corresponding to the Western part of the African coast situated between the Canary Islands and Cape Verde, taking into account a series of examples of flora and fauna that, from a biogeographical point of view, link the archipelagos of Macaronesia (i.e. the western Canary Islands) and the corresponding continental enclave.

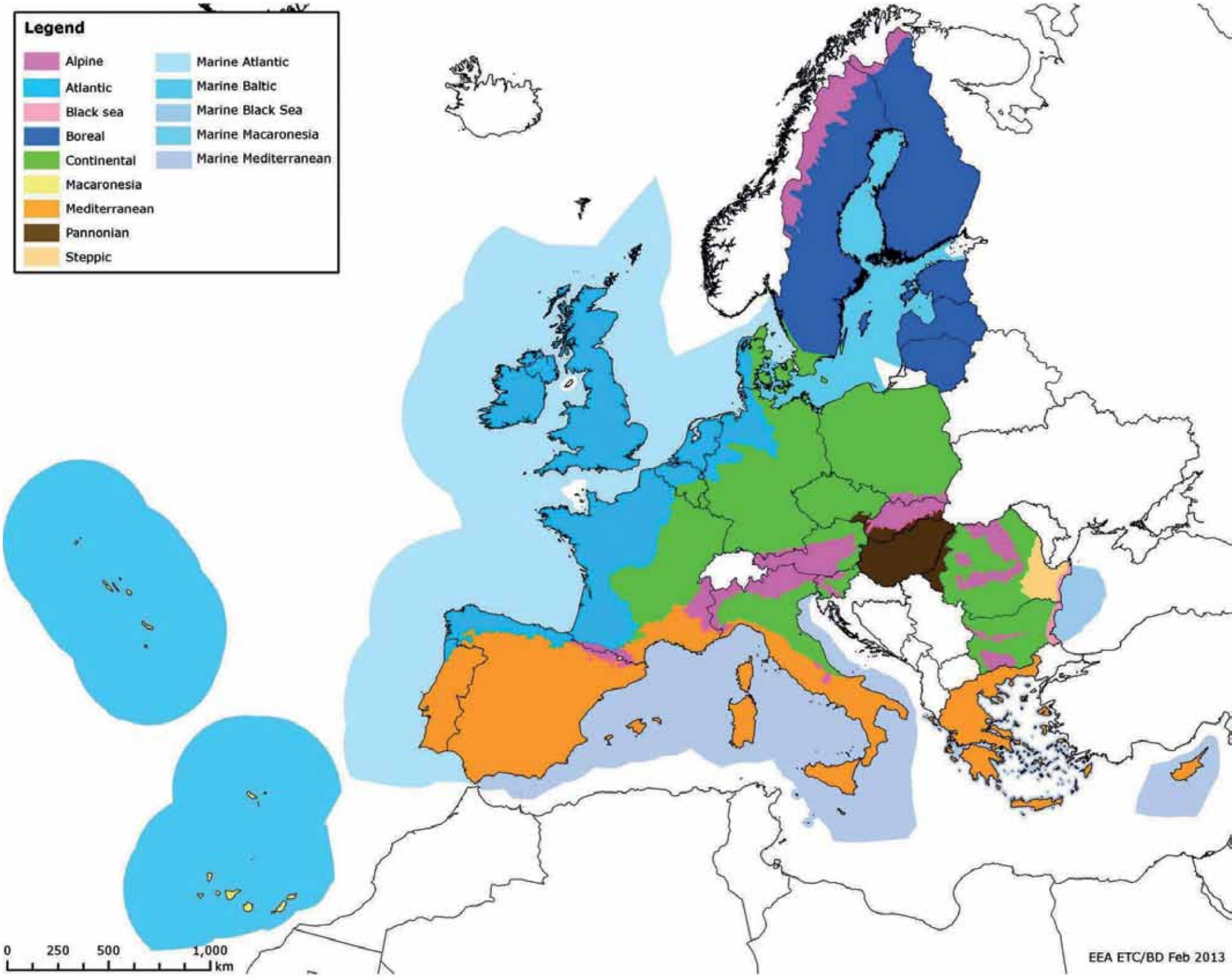


Figure 19. Biogeographical regions designated in the Habitats Directive

Figure 20. Macaronesian archipelagos

Figure 21. General appearance of the island of São Jorge, Ponta dos Rosais

9. LAND USE

9.1. HISTORICAL

The settling of the territory of the Azores observes similar land-use patterns as the population has predominantly settled along a linear strip parallel to but slightly inland from the coastline. This settlement, which has been in place for centuries, is the result of better climate conditions and less irregular terrain. Human settlements are rarely found elsewhere and, when they do occur, they are the result of exceptional situations, as on the island of São Jorge, where settlements appear at higher altitudes due to the physiographic characteristics of the territory.

The distribution of uses and human activities is therefore directly related to the altitude and relief of the islands, taking into account the fact that this relief and the associated soil and climate conditions are decisive factors in the zonation of crops, the development of natural vegetation, and the settlement of populations. Generally speaking, the majority of settlements, agricultural areas and some arable crops are located at altitudes of up to 150 metres. Most of the pastureland, which is punctuated by bushes or woods in steeper areas or situated on *biscoitos* and *mistérios* (types of lava bed), is located at altitudes of between 150 and 300 metres[9]. Above this level, high-altitude bushes occur.

A long and narrow strip of land, the island of São Jorge is characterised by its linear shape and by its imposing coastal cliffs, which reach heights of 700 metres.

On the steep coast of the island are small, relatively flat, surfaces occupied by agricultural lands that are given the name of *fajãs*. The landscape and culture of the *fajãs* make them a valuable form of heritage. For this reason, many of them have been included in the proposed biosphere reserve.

9 *Biscoitos* and *mistérios* are terrains formed by lava flows from volcanic eruptions on which there is no arable land.

Figure 22. North coast of São Jorge, Fajã da Caldeira de Santo Cristo

Despite their geomorphological similarity, the *fajãs* of the island of São Jorge are mainly differentiated by their predominant agricultural crop, which varies in accordance with the existing microclimate, by the handicraft produced, by their temples and chapels, and by various feature that bear witness to the ingenuity of the inhabitants in overcoming some of the hardships that they have always faced. The *fajãs* of São Jorge therefore constitute a unique model of spatial occupation that has resulted in a characteristic form of settlement in which terraces are created and all available flat surfaces are put to use. They have also given rise to a style of architecture characterised by great sobriety and functionality which plays a key role in shaping the typical character of the *fajãs*.

The designs of rural houses on São Jorge are adapted to the rough nature of the island's geography. The most characteristic and unique style of rural house has a separate kitchen that is perpendicularly linked in a T- or L- shape with the remaining rooms. Kitchens are so located in order to protect the rest of the house from fumes, smells and fires. (Since there were no chimneys, the fumes escaped through holes between the tiles).

The rough morphology of the terrain normally allowed a ground floor to be created under the the rooms. This space, which is called a *loja*, served as a place in which to keep animals, agricultural tools and farm produce. Since the *loja* was a dispensable element, albeit one that was included within the building, it was isolated as it lacked an internal connection to the dwelling space.

Houses are made of stone and are simply decorated, with the stone also being left bare inside the house. The loose roof is made of ceramic tubular tiles reinforced only by a row of stones along the ridge and eaves to provide greater resistance against strong winds and storms.

Figure 23. Typical L-shaped house, Fajã da Caldeira de Cima

As the *fajãs* were hard to access, it made sense to construct small overnight houses that would allow people to stay for longer periods of time. The specific character of most of the *fajãs* on the island of São Jorge is also the result of the seasonal nature of their occupation, which is greatest when crops are abundant and also depends on weather conditions.

A phenomenon known locally as *mudas* involves people moving from their houses in the parishes (in the higher parts of the island) to their houses on the *fajãs*, which were often little more than cellars or small houses consisting of only a kitchen and a bedroom. *Mudas* most often take place in winter, when the climate on the higher parts of the island is suited neither to farming nor to human dwelling, and in late summer, a period associated with the grape harvests when life on the *fajãs* becomes very busy.

Ever since they were first settled, many of the *fajãs* have been used in a seasonal manner associated with the uses and activities undertaken on them, which include subsistence farming. As they are located in areas where the climate is milder, the *fajãs* of São Jorge were also associated with the production of food, including fruit and vegetables, which served to supply the main houses in the various parishes on the island.

Thus, over the years, customs associated with the *fajãs* emerged that were unique on the Azores, resulting in a cultural distinctiveness that is still evident today.

9.2. WHO ARE THE MAIN USERS OF THE BIOSPHERE RESERVE?

As it is proposed, the biosphere reserve corresponds to the whole of the island of São Jorge and will therefore be used by the general population and by all visitors to the island.

9.3. WHAT ARE THE RULES (INCLUDING CUSTOMARY OR TRADITIONAL) OF LAND USE IN AND ACCESS TO EACH ZONE OF THE BIOSPHERE RESERVE?

The right to own private land is considered to be a fundamental right and is therefore enshrined in the terms of the Constitution of the Portuguese Republic[10].

In accordance with the General Framework for Public Policy on Land, Land Use and Town Planning, approved by Law no. 31/2014 of 30 May, the right to private property and other land-related rights are considered and formed within the framework of legal relations governing land use and town planning, establishing protected constitutional principles and values, specifically in the fields of national defence, the environment, culture, cultural heritage, landscape, public health, education, housing, quality of life and economic and social development.

Land planning in the Azores is governed through a land-management system that has evolved considerably in the last ten years as a result of efforts made by the Regional Government and the local authorities. The legal framework of the aforementioned Land-Management System is the Legal System of Instruments for Land Management in the Azores, which is approved by Regional Legislative Decree no. 35/2012/A of 16 August and implemented at the regional and municipal (or cross-municipal) level.

Regional-level instruments include the Regional Land-Use Plan of the Azores (PROTA), sectoral plans, and special land-use plans, which include plans governing the use of the coastal areas, the hydrographic basins of lagoons, and protected areas. Municipal-level instruments include municipal (or cross-municipal) land-use plans, namely, municipal (or cross-municipal) master plans, urbanisation plans and layout plans.

The main strategic options that pertain to the organisation of land in the Azores Archipelago are set out in the **Regional Land-Use Plan of the Azores (PROTA)**, approved by Regional Legislative Decree no. 26/2010/A of 12 August. At the regional level, the main aims of this plan are to develop national options for land-planning policies and sectoral policies by expressing, in spatial terms, the

10 Article 62 of the Constitution of the Portuguese Republic.

principle aims of economic, social and environmental development in the region; to draw up a regional strategy for land planning and a benchmark system for the elaboration of spatial, municipal and cross-municipal land-use plans; to direct the harmonisation of the various sectoral policies concerning space, particularly those relating to the environment and natural resources; to contribute to reducing imbalances in intra-regional development, taking into account the specific characteristics of each island; and to defend the value of the landscape and natural and cultural heritage as elements that make up the identity of the region, protecting, managing and planning it in conjunction with the undertaking of human activities.

Besides containing guidelines on the use, occupation and transformation of land in the region, PROTA also defines specific norms of a territorial nature for each island.

In the case of the island of São Jorge, PROTA grants priority to actions that enhance the value of cultural landscapes defined within the territorial model, namely, the Fajã do Ouvidor, Fajã de São João, Fajã dos Vimes, Fajã dos Cubres, Fajã da Caldeira de Santo Cristo, Fajã da Ribeira da Areia and Fajã das Almas, all of which form part of the core areas of the proposed biosphere reserve, with the exception of the Fajã do Ouvidor. At the same time, PROTA recommends that the shortage of environmental services and infrastructure should be resolved and that an area should be created in which advanced services involving productive activity are concentrated in order to favour services supporting the certification and rating of São Jorge cheese and other rural extension services.

Other aims for São Jorge set out in PROTA include increasing levels of energy self-sufficiency; filling in gaps in the urban grid in urban areas located outside of municipal seats that have a low building density; and monitoring urban areas which are set to expand in accordance with municipal master plans, given that the high percentage of seasonal-use dwellings cannot be converted into year-round dwellings due to the tradition of secondary use practised on this island at low altitudes, specifically on the *fajãs*.

The sectoral policy instruments in force include the Sectoral Plan for the Natura 2000 Network of the Autonomous Region of the Azores (PSRN2000), the Tourism Land-Use Plan for the Autonomous Region of the Azores (POTRAA), the Regional Water Plan (PRA), the Hydrographic Region Management Plan (PGRH-Azores), and the Strategic Waste-Management Plan for the Azores (PEGRA).

The **Sectoral Plan for the Natura 2000 Network of the Autonomous Region of the Azores (PSRN2000)**, approved by Regional Legislative Decree no. 20/2006/A of 6 June[11]. This plan defines the scope and legal framework of measures for conserving habitats and species of wild flora and fauna that are necessary in order to fulfil the conservation aims for existing natural assets, taking into account the social and economic development of the areas covered. The main aims of PSRN2000 are to protect the wild states of species and ecosystems; to undertake scientific research and maintain environmental services; to safeguard specific natural and cultural features; to ensure compatibility between nature conservation, tourism, recreation and leisure; to undertake awareness-raising and environmental-education actions; and to use existing resources in natural ecosystems in a sustainable manner.

11 Modified by Modification Statement no. 48-A/2006 of 7 August and amended by Regional Legislative Decree no. 7/2007/A of 10 April.

The Special Areas of Conservation (SAC) that form part of the Natura 2000 Network on the island of São Jorge are "Ponta dos Rosais" and "Costa Nordeste e Ponta do Topo" [North-east Coast and Ponta do Topo] and the Special Protection Area (SPA) "Ilhéu do Topo e Costa Adjacente" [Topo Islet and Adjacent Coast]. All of these areas are within the core zones of the Biosphere Reserve application.

PSRN2000 also sets out a series of mitigatory and preventive measures for the various activity sectors. For example, where the environment and nature-conservation sectors are concerned, it serves to enhance and expand natural plant formations in order to reconcile protective functions and the increase in biodiversity. Where the recreation, leisure and tourism sector is concerned, PSRN2000 is safeguarded and brought into line with the Tourism Land-Use Plan for the Autonomous Region of the Azores (POTRAA), taking into account the carrying capacities of ecosystems and the incorporation of nature tourism as an important area for development on the island of São Jorge.

The **Tourism Land-Use Plan for the Autonomous Region of the Azores (POTRAA)**, approved by Regional Legislative Decree no. 38/2008/A of 11 August, defines the sustainable-development strategy for the tourism sector and the territorial model to be adopted. Its overall aims are to develop and establish a sustainable-tourism sector that safeguards economic development; to preserve the natural and human environment; and to contribute to land planning on the island and to the reduction of the disparity between the various spaces that make up the region.

The land-use model set out in POTRAA includes Urban Spaces with the Potential for Tourism Development, Specific Tourism Spaces, Rural and other Non-Differentiated Spaces, Highly Sensitive Ecological Spaces, Spaces of Potential Conflict, Places of Interest to Tourists and Access Routes. Where Specific Tourism Spaces on São Jorge are concerned, attention should be drawn to the strip between Urzelina and Manadas on the south coast of the island, in the municipality of Velas, which does not form part of the core areas set out in the application for biosphere-reserve status.

Attention should also be drawn to the Highly Sensitive Ecological Spaces, i.e., spaces that have particularly sensitive ecological characteristics or whose use is totally or partially compromised by a lack of biophysical aptitude. Such spaces include nature reserves, natural forest reserves, protected landscapes, biotopes, special protection areas, sites of Community interest, sites at risk of erosion, cliffs, coastal areas, and the hydrographic basins of lagoons, all of which are included in the core areas of the proposed biosphere reserve.

Lastly, Places of Interest to Tourists include bays, lagoons, waterfalls, *fajãs*, natural phenomena, unique features, parks, public gardens, and recreational forest reserves, all of which are included in the core areas set out in the application for biosphere-reserve status.

Another sectoral policy instrument that is relevant as a water-resource planning instrument is the **Regional Water Plan (PRA)** published by Regional Legislative Decree no. 19/2003/A of 23 April. The drawing up of the PRA involved defining a series of strategic guidelines in the area of water-resource planning and management for the region. These guidelines concern the protection of water

quality, the improvement of the water offer and the management of the demand for water needed for populations and economic activities, the protection of natural resources, and the linking of land planning and water-related planning.

Where the protection of natural resources is concerned, attention must be drawn to the need to protect and regenerate water resources and the surrounding environment in ecosystems of particular interest with a view to enhancing their ecological, environmental and heritage value, thereby safeguarding the richness and diversity of water systems and associated aquatic and terrestrial ecosystems and minimizing and compensating for the environmental impact of man-made water resources.

With regard to the linking of land planning and water management, attention must be drawn to the process of promoting and enhancing the economic value of water resources that are of interest from a landscape, cultural, recreational, leisure, tourism, energy or other point of view, provided that this is compatible with the preservation of water resources and the planning and integrated management of surface, subterranean and coastal waters, thereby encouraging the planning of uses and occupations in the area of water.

With regard to the implementation of the water-resource management strategy, the Autonomous Region of the Azores also has a **Hydrographic Region Management Plan (PGRH-Azores)** which is run in the context of the Water Framework Directive[12] and covers all of the hydrographic basins of the nine islands in the archipelago, including the respective subterranean water courses and adjacent coastal waters, ratified by Government Council Resolution no. 24/2013, of 27 March.

Where sectoral instruments are concerned, mention must also be made of the **Strategic Plan for Waste Management in the Azores (PEGRA)**, approved by Regional Legislative Decree no. 10/2008/A of 12 May[13], which aims to help implement technological infrastructure that safeguards the quality of the service and protects the environment, encouraging eco-efficiency within the business sector and promoting the economic-financial sustainability of the waste-management system. PEGRA therefore serves to ensure that waste is managed in accordance with national and EU obligations in this area. This plan sets out aims and goals according to thematic areas and the material scheduling involves defining the programmes and projects to be developed in order to achieve the strategic guidelines and aims set down in it.

PEGRA also provides details of planned technological units in accordance with the type of waste to be managed. On the island of São Jorge, one such unit is the Waste Processing and Organic Composting Centre, which is in the parish of Calheta and therefore not within the core zones of the proposed biosphere reserve.

The São Jorge Waste Processing Centre entered into service at the beginning of 2015 and is expected to be able to process (recycle and compost) at least 85% of the urban waste generated on the island. Around 15% of non-processable urban waste is taken to Terceira or São Miguel islands for disposal since there are no longer any landfill sites on the island of São Jorge.

In addition to the sectoral plans in force, approval was recently granted to the **Sectoral Land-Use Plan for Mining Activities**

12 Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000.

13 Modified by Modification Declaration no. 36/2008 of 11 July.

in the Autonomous Region of the Azores (PAE) with a view to implementing an integrated management policy for non-metallic mineral resources in all municipalities in the region in order to rationalise the activities of the mining industry. At the time of writing, the **Regional Strategy on Climate Change (PRAC)** is being drawn up, implementing the Regional Strategy on Climate Change approved by Regional Government Council Resolution no. 123/2011 of 19 October, which will establish measures that enable various strategic sectors to mitigate and adapt to climate change.

Special land-use plans create a supplementary means by which the Government of the Azores can intervene in the area of land use, taking into account the need to fulfil objectives of relevant public interest that have spatial repercussions, establishing systems by which to safeguard resources and natural and built assets, including landscape assets, and ensuring the durability of systems that are indispensable to sustainable use of the land.

In this respect, approval has been granted to the **Coastal Zone Management Plan (POOC São Jorge)** for the island of São Jorge through Regional Regulatory Decree no. 24/2005/A of 26 October. This regulatory decree establishes rules governing the occupation, use and transformation of land in the area of intervention, which covers a protected terrestrial area with a width of 500 metres and a protected maritime strip whose boundary is at a distance of 0.5 nautical miles.

The specific objectives of the POOC São Jorge are to safeguard and enhance the environmental value of natural and landscape resources, particularly water resources, as well as built heritage; to protect and enhance the value of natural ecosystems of interest to nature conservation; to minimise and prevent risk situations; to classify and enhance the value of bathing areas; to guide the development of specific activities in coastal areas; to promote the quality of life of the population; and to strengthen transport and communications systems as a factor in enhancing regional cohesion.

With regard to systems for safeguarding natural resources and assets and the corresponding management systems that are compatible with the sustainable use of the land, the Plan breaks down the coastal area of the island of São Jorge into the following preferential uses: bathing use, natural and cultural use, forest use, agricultural use and urban use.

Bathing use is safeguarded by the establishment of duly identified bathing areas associated with a series of rules whose aim is to safeguard their use. The following bathing areas are located in the municipality of Calheta: Portinhos, Fajã Grande and the swimming pools in Calheta (Type 1 – bathing areas suited to intensive use) and Pontinha do Topo, Fajã de São João, Fajã das Pontas, Fajã dos Vimes and Porto Novo – Ribeira Seca (Type 2 – bathing areas whose use is restricted). The following bathing areas are located in the municipality of Velas: Preguiça and Poço dos Frades (Type 1 – bathing areas suited to intensive use) and Porto Manadas, Moinhos-Urzelina, Urzelina, Fajã do Ouvidor, Terreiros and Fajã das Almas (Type 2 – bathing areas whose use is restricted). The following five bathing areas on the island of São Jorge are located within the core zones of the proposed biosphere reserve: Fajã de São João, Fajã das Pontas, Fajã dos Vimes, Fajã das Almas and Pontinha do Topo.

Areas set aside for natural and cultural use, which are delimited by nature- and biodiversity-conservation criteria, are subdivided into areas of special environmental interest, *fajãs* populated by humans, and other natural and cultural areas such as cliffs and corresponding protected areas.

Areas of special environmental interest include terrestrial and marine habitats and correspond to the Fajã de São João and the Fajã dos Vimes in the municipality of Calheta and Ponta dos Rosais, the Bay of Entre Morros das Velas, the coast between the airport and the sea, the escarpments of the Areeiro river and Ponta dos Casteletes in the municipality of Velas, as well as the two areas that cover both municipalities: the north-east coast and Ponta do Topo. The majority of these areas are located in the core zones of the proposed biosphere reserve.

The *fajãs* correspond to relatively flat areas, nestling in the coastal cliffs, that are traditionally occupied by crops and/or built structures. They are characterised by their highly unique landscapes; by their natural instability, which is inseparable from their origins; by their high cultural, landscape and environmental value; and by the existence of habitats and species that are of interest from the point of view of both biodiversity and nature conservation. The POOC São Jorge regulations define two types of *fajã*.

- Type 1: Traditionally inhabited humanised *fajãs* in which the infrastructure and road-access conditions allow housing to be installed as part of Tourism in Rural Space projects;
- Type 2: Traditionally inhabited humanised *fajãs* whose natural conditions and lack of accessibility restrict the use of road vehicles, affecting the ease with which they can be visited, unless they can come to be recognised as areas set aside for Tourism in Rural Space.

Type 1 humanized *fajãs* include those of São João, Vimes, Cubres, Ribeira da Areia, Almas, Bodes, Penedia and Pontas while Type 2 *fajãs* include those of Caldeira de Santo Cristo, João Dias, Neca, Belo, Tijolos and d'Além. They are all located within the core areas of the proposed biosphere reserve.

The existing forest use in the intervention area of the POOC São Jorge corresponds to small areas adjacent to the intervention area in which the exploitation of the forest is subject to severe constraints. The functions of the forest in question are primarily protective and the areas identified as being mainly for agricultural use correspond to zones bordering the intervention area of the POOC, which predominantly contain pasture land.

Lastly, urban use corresponds to areas containing high levels of infrastructure and concentrations of buildings where the land is primarily set aside for urbanized zones and zones considered likely to acquire predominantly urban characteristics. The POOC covers urban-use areas in the following settlements: Norte Grande, Rosais, Velas, Ouvidor, Urzelina and Manadas in the municipality of Velas and Calheta, Topo and Ribeira Seca in the municipality of Calheta, all of which are located outside of the core zones of the proposed biosphere reserve.

The municipal land-use plans for the territory are, by nature, the planning instruments that define the relevant system of land use and the municipal management policies. The island of São Jorge is covered by the **Vela Municipal Master Plan (PDM Velas)**,

approved by Regional Regulatory Decree no. 7/2005/A of 23 March,[14] and by the **Calheta Municipal Master Plan (PDM Calheta)**, approved by Regional Regulatory Decree no. 23/2006/A of 6 July[15].

The objectives of both of the municipal master plans are to preserve and enhance the natural heritage of the corresponding municipalities, to manage the use of agroforestry, to improve the quality and competitiveness of São Jorge cheese, to support and promote specialised tourism sectors, to improve the functionality of infrastructure, to safeguard and improve the water-supply system, to improve urban living conditions in the municipality, and to improve the conditions for attracting and retaining human resources.

Both the PDM Velas and the PDM Calheta define the following areas as spatial classes within the corresponding intervention areas: urban spaces (areas with high levels of infrastructure and building concentrations where the land is predominantly used for construction); areas capable of being developed (areas which may predominantly acquire the characteristics of urban spaces); industrial spaces (areas that are duly equipped with infrastructure and are used for the installation of industrial units, storage units, and services that support industrial activity); agricultural spaces (areas whose characteristics predominantly make them suited to agricultural and farming activities or that may come to acquire such characteristics; these spaces can be subdivided into areas permanently used for arable farming and those used occasionally for arable farming); forest spaces (areas that are predominantly suited to forestry and that simultaneously allow other compatible uses; these areas can be subdivided into productive forestry spaces and protected forestry spaces); cultural and natural spaces (areas in which priority is given to protecting natural, cultural and landscape assets); spaces for mining industries (units formed by quarries and their annexes); and channel spaces (areas occupied by transport and communication infrastructure and other primary infrastructure pertaining to the municipality).

Thus, in the PDM Velas, the Cultural and Natural Spaces correspond to the Natural Forest Reserves of Pico das Caldeirinhas, Picos do Carvão e da Esperança and Pico do Arieiro, all of which form part of the core zones of the proposed biosphere reserve; to the coastal areas (cliffs, beaches, islets and other coastal ecosystems); and to the watercourses, lagoons and corresponding protected strips as well as architectural and urban heritage. The Urban Spaces that are defined are Velas, Urzelina, Norte Grande, Rosais, Beira, Santo Amaro, Queimada, Manadas, Toledo, Santo António, Ribeira da Areia and Fajã do Ouvidor. In turn, the spaces capable of being developed correspond to Velas, Urzelina and Norte Grande while the industrial spaces correspond to the industrial area of Velas, the light-industry and storage area of Urzelina and the light-industry and storage area of Norte Grande. The Urban Spaces, Spaces Capable of Being Developed and Industrial Spaces of the PDM Velas are not located within the core areas of the application for biosphere-reserve status.

In the PDM Calheta, the Natural and Cultural Spaces correspond to the Partial Nature Reserve of the Islet of Topo; the Special Ecological Area of the Lagoon of Fajã da Caldeira de Santo Cristo (both of which form part of the core areas of the proposed

14 Amended by Regional Regulatory Decree no. 22/2005/A of 12 October, and presently being revised.

15 Partially suspended by Regional Regulatory Decree no. 8/2010/A of 7 April and amended by Notice no. 12551/2013 of 10 October.

biosphere reserve); the Recreational Forest Reserves of Silveira; the watercourses, lagoon, reservoir and corresponding protected strips; the coastal area (cliffs, beaches, islets and other coastal ecosystems); and the architectural and urban heritage. The Urban Spaces correspond to Calheta, Santo Antão, Topo, Norte Pequeno, Ribeira Seca and São Tomé and the Spaces Capable of Being Developed correspond to Calheta and Santo Antão. The Industrial Spaces correspond to the light-industry and storage area of Calheta and to the light-industry and storage area of Santo Antão. Also in Calheta, the Urban Spaces, Spaces Capable of Being Developed and Industrial Spaces of the PDM are not located within the core zones of the application for biosphere-reserve status.

Where the land management of the proposed Biosphere Reserve is concerned, attention must also be paid to the areas that form part of the **São Jorge Natural Park (PNSJ)**, created by Regional Legislative Decree no. 10/2011/A of 28 March, which is the management unit for all of the protected areas of the island belonging to the Network of Protected Areas of the Azores[16].

The terrestrial and marine areas that make up the São Jorge Natural Park are classified according to the following categories of protected areas: Natural Monument (Ponta dos Rosais), Protected Area for the Management of Habitats and Species (North-West Coast, South-West Coast, Costa das Velas, Pico da Esperança and the Central Plateau, Fajã das Almas, Costa do Topo, and the Islet of Topo), Protected Landscape Area (Fajãs do Norte), and Protected Areas for the Management of Resources (West Coast, Costa das Fajãs, Entre Morros and the North-East Coast). All of these areas fall within and form the boundaries of the core areas of the application for biosphere-reserve status.

There currently exists a Management Plan for the Fajãs da Caldeira de Santo Cristo e dos Cubres (PGFCSCC)[17] whose aims are to define a management model, to manage and regenerate heritage in order to enhance the well-being of residents and visitors, to safeguard environmental quality and enhance the value of the lagoon and terrestrial systems of the *fajãs*, to enhance the exploitation of resources and the socio-economic value obtained from them in a sustainable manner, and to increase scientific knowledge of the site and the dissemination of this knowledge.

An action plan will be drawn up for the São Jorge Natural Park with the aim of establishing systems for safeguarding resources and natural assets in accordance with the various categories of protected area, defining uses and a management system that are compatible with the sustainable use of the land in conjunction with the land-management instruments in force.

▶ LAND USE IN THE CORE AREAS OF THE BIOSPHERE RESERVE

Where land use is concerned, the information presented above must be supplemented by the various land-use and transformation proposals set down in the various land-management instruments in force, specifically, in the POOC São Jorge and the Velas and Calheta PDMs for sites that form part of the core areas of the proposed biosphere reserve.

16 Chapter III of Regional Legislative Decree no. 15/2012/A of 2 April.

17 Approved by Ordinance no. 44/2010 of 30 April.

Thus, in accordance with the terms of the POOC São Jorge, the terrestrial part of the core areas of the proposed biosphere reserve consists of Areas of Special Environmental Interest and of Other Natural Areas.

The core area of Ponta dos Rosais (only 27.5% of which is terrestrial) consists entirely of Areas of Special Environmental Interest.

The core areas of Fajãs João Dias, Vasco Martins, Rasa, Manuel Teixeira and Fajã d'Além on the north coast and the core area of Fajã das Almas on the south coast consist entirely of Other Natural Areas.

76% of the the core area that comprises the *fajãs* of Fragueira, Vimes, Bodes and Cavalete consists of Areas of Special Environmental Interest while the remaining 24% consists of Other Natural Areas.

Around 70% of the core area comprising the *fajãs* of Ginjal, Além (on the south coast), São João and Saramagueira consists of Areas of Special Environmental Interest while the remaining 30% consists of Other Natural Areas.

The terrestrial part of the core area of Topo (which represents only 1.2% of the total core area) consists entirely of Areas of Special Environmental Interest.

The majority of the core area of Velas (over 80%) consists of Areas of Special Environmental Interest while around 18% consists of Other Natural Areas.

With regard to the terrestrial core area belonging to the municipality of Velas (only 9.3% of which is terrestrial), around 58% consists of Other Natural Areas while the remaining 42% consists of Areas of Special Environmental Interest. In turn, the vast majority (around 88%) of the terrestrial core area belonging to the municipality of Calheta (26.3% of which is terrestrial) consists of Areas of Special Environmental Interest while only 12% is located in Other Natural Areas.

An examination of the PDM Velas reveals that the majority of the terrestrial parts of the core areas of the proposed biosphere reserve within this municipality consist of Natural and Cultural Spaces, followed by Agricultural Spaces, Forest Spaces, Urban Spaces and Spaces Capable of Being Developed, in that order.

With regard to the core area of Ponta dos Rosais (only 33% of which is terrestrial), around 58% consists of Natural and Cultural Spaces (specifically, coastal areas), around 31% consists of Protected Forest Spaces, and around 11% consists of Agricultural Spaces, the majority of which are Agricultural Spaces Permanently or Occasionally Used for Arable Farming.

The overwhelming majority of the Fajã de João Dias (around 91%) consists of Agricultural Spaces Occasionally Used for Arable Farming while only 9% consists of Cultural and Natural Spaces (coastal areas).

The entirety of the core area comprising the *fajãs* of Vasco Martins, Rasa and Manuel Teixeira consists of Cultural and Natural Spaces (specifically, coastal areas). The same can be said of the Fajã d'Além on the north coast, which consists entirely of Cultural and Natural Spaces (coastal areas). 76% of the Fajã das Almas consists of Agricultural Spaces Occasionally Used for Arable Farming while 24% consists of Cultural and Natural Spaces (specifically, coastal spaces).

The terrestrial part of the core area of Velas occupies only 9.5% of this core area, of which 68% consists of Cultural and Natural

Spaces (specifically, coastal areas), around 29% consists of Protected Forest Areas, 2.7% consists of Urban Spaces, and 0.4% consists of Spaces Capable of Being Developed.

The majority of the core area in the municipality of Velas consists of Forest Spaces (65%), particularly protected spaces, while around 30% consists of Cultural and Natural Spaces, many of which are partial natural forest reserves, followed by coastal areas, lagoons and their corresponding protected areas. Only 5% of the area consists of Agricultural Spaces Occasionally Used for Arable Farming.

With regard to the PDM Calheta, around 60% of the core area that makes up the *fajãs* of Fragueira, Vimes, Bodes and Cavalete consists of Coastal Areas, around 21% consists of Protected Forest Spaces, around 19% consists of Cultural and Natural Spaces while only 0.4% consists of Spaces Capable of Being Developed.

In turn, the majority of the core area that makes up the *fajãs* of Ginjal, Além (on the south coast), São João and Saramagueira consists of coastal areas (around 83%) while only 12% consists of Cultural and Natural Spaces and 5% consists of Protected Forest Areas.

Over 80% of the core area of Topo consists of Cultural and Natural Spaces while around 20% consists of Coastal Areas.

The overwhelming majority (around 77%) of the terrestrial core area belonging to the Municipality of Calheta (60% of which is terrestrial) consists of Forest Spaces (essentially protected areas) while around 23% consists of Coastal Areas and only 0.8% consists of Cultural and Natural Spaces.

9.4. DESCRIBE WOMEN'S AND MEN'S DIFFERENT LEVELS OF ACCESS TO AND CONTROL OVER RESOURCES

Article 13 of the Constitution of the Republic of Portugal enshrines the principle of equality, giving every citizen the same dignity before the Law, and provides that no one may be privileged, favoured, prejudiced or deprived of any right or exempted from any duty by reason of their ancestry, sex, race, language, place of origin, religion, political or ideological convictions, education, economic status, social background or sexual orientation.

10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE

The population of the Fajãs de São Jorge Biosphere Reserve is spread across three areas (core, buffer and transition), as shown in the following table:

Table nº. 4 – Population of the Biosphere Reserve

	PERMANENTLY (2011 CENSUS)	SEASONALLY (WINTER)	SEASONALLY (SUMMER)
10.1. CORE AREAS:	188	583	1.075
10.2. BUFFER AREAS:	767	774	852
10.3. TRANSITION AREAS:	8217	8368	9.142
TOTAL:	**9171**	**9725**	**11069**

It appears that only 2% of the population of the island of São Jorge lives in the core areas of the Biosphere Reserve, as set out here, for which demographic analysis is presented at island, municipality and parish level. This is consistent with breakdown of existing demographic data.

▶ POPULATION TRENDS

In the last half-century, the population on the Azores archipelago has undergone two main trends. First, there was an abrupt fall in the population between 1960 and 1991 (albeit only a modest fall between 1981 and 1991), with a loss of 27.4% of its people (around 90,000 inhabitants). Second, there was a moderate increase in the population between 1991 and 2011.

However, the 246,746 inhabitants recorded in 2011 fall far short of the 327,466 people living in the Azores in 1960.

Over the same period, the island of São Jorge went from 15,895 inhabitants (1960) to 9,171 (2011), losing 42.3% of its population. Between 1960 and 1981 São Jorge lost more than a third of its population (5,534 inhabitants).

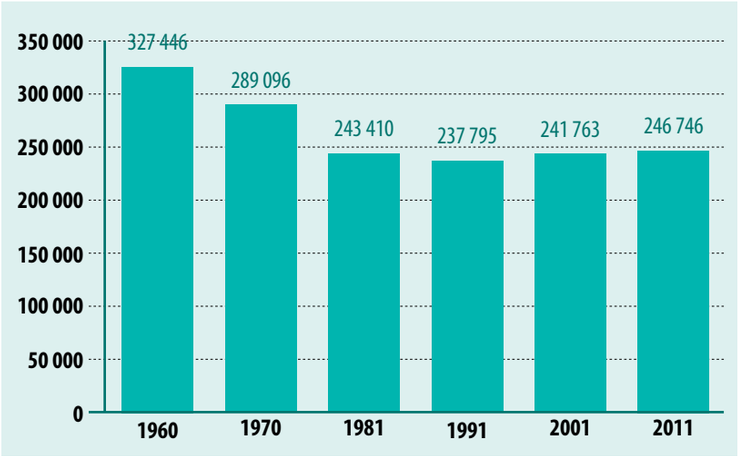


Figure 24. Population trends for the Azores between 1960 and 2011

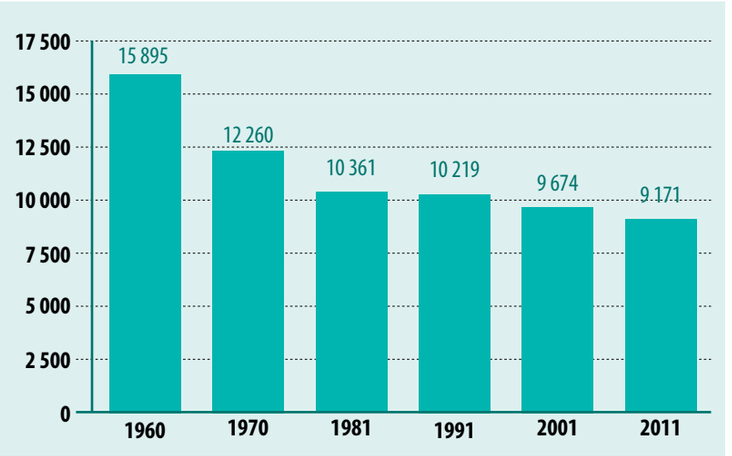


Figure 25. Population trends for the island of São Jorge between 1960 and 2011

The enormous demographic downturn seen in the Azores, in general, and the island of São Jorge, in particular, in the period from 1960 and 1981, is inextricably linked to the occurrence of a number of natural disasters[18], which resulted in massive emigration, especially to the USA, due to the Immigration and Nationality Act of 1965.

Figure 26.
President Lyndon B. Johnson signing the "Immigration and Nationality Act"

18 In particular the seismic activity experienced in 1964.

However, the population downturn on the island of São Jorge over the last two decades has represented a counter-cycle to the increase of the population recorded over the same period at regional and national level.

Table nº. 5 – Resident population in the Azores within the overall context of the country

INHABITANTS	2001			2011		
	Total	H	M	Total	H	M
R. A. Açores	241 763	119 486	122 277	246 772	121 534	125 238
Portugal	10 356 117	5 000 141	5 355 976	10 562 178	5 046 600	5 515 578

At a municipal level, the municipality of Calheta has recorded a major drop in the resident population since 1991 (around 19.6%), while the municipality of Velas has seen a drop of around 5.7% in its resident population.

In 2011 the parishes with the highest resident population were Velas, in the municipality of the same name, with 1,985 inhabitants, and Calheta and Ribeira Seca, in the Calheta municipality, with 1,275 and 1,025 inhabitants respectively. Recorded as having less than 500 inhabitants were the parishes of Norte Pequeno, in the Calheta municipality, with 220 inhabitants, and Manadas, in the Velas municipality, with 374 inhabitants.

Figure 27. Distribution of the resident population on São Jorge (2011)

Figure 28. The Town of Velas

With 9,171 inhabitants in 2011, the island of São Jorge represented only 3.7% of the Azorean population. As in previous decades, the population density on this island has continued to be low, with 38 inhabitants per square kilometre – well below the average of the Autonomous Region of the Azores (106 inhabitants per square kilometre).

In 2011 there were 30 inhabitants per square kilometre in the Calheta municipality, and 46 inhabitants per square kilometre in the Velas municipality. At parish level, the areas of lowest population density occur in Norte Grande, in the Velas municipality, and in Norte Pequeno and Ribeiro Seca, in the Calheta municipality, with 17, 18 and 19 inhabitants per square kilometre respectively. At the opposite end of the spectrum is the town of Velas, with a population density of 143 inhabitants per square kilometre, which is higher than the average for the archipelago.

In terms of demographic structure, the island of São Jorge is considered to have an ageing population. In 1991 the percentage of residents on the island aged 65 or more was 15%, rising to 18% in 2001 and 19% in 2011 – well above the regional average of 13% (2011).

In terms of working-age population, São Jorge recorded around 61% in 1991, around 65% in 2001 and around 66% in 2011. For its part, the young population was 23% in 1991, 18% in 2011 and 15% in 2011.

According to the data provided for the last population census (2011), the Calheta municipality recorded that 20% of its residents were 65 or over, 65% were of working age and 15% were young people, while the Velas municipality recorded that 18% of its residents were aged 65 or over, 67% were of working age and 14% were young people.

The 2011 census also shows that over the last two decades there has been an increase in the number of families on the island of São Jorge, from 3,055 families in 1991 to 3,237 families in 2001, and 3,413 families in 2011. However, the average family size has dropped from 3.34 individuals in 1991 to 2.98 individuals in 2001 and 2.68 individuals in 2011. From 2001 to 2011 the two municipal seats (the Velas and Calheta parishes) recorded the greatest increases in the number of families.

According to the results of the last Population Census (2011), around 6% of the residents of the island of São Jorge cannot read or write, 69% have completed compulsory basic education, 14% have completed high school and 8% have undergone higher education.

Parishes that recorded a higher number of residents without a basic level of education were Calheta and Norte Pequeno, in the Calheta municipality, and Manadas, in the Velas municipality. By contrast, in 2011 the parishes of Calheta, in the Calheta municipality, and Velas, Urzelina and Santo Amaro, in the Velas municipality, represented a higher number of residents who had undergone higher education.

10.4. BRIEF DESCRIPTION OF THE LOCAL COMMUNITIES LIVING WITHIN OR NEAR THE PROPOSED BIOSPHERE RESERVE

Like the other islands in the Azores archipelago, the island of São Jorge was uninhabited when it was discovered by the Portuguese, without any indigenous population. The current population is the result of settlement and the mixing of ethnic groups.

From a genetic point of view, the population of the Azores is very similar to that of continental Europe, from where the majority of its settlers originally came. Historical documents reveal that the Azores were settled mainly by the Portuguese, especially from the Algarve, Alentejo and Minho regions. There are also records of settlers from the Madeira archipelago, along with people of Jewish origin and those from other European countries, especially Flemish settlers, who had a greater presence on the central islands, in particular Faial. The presence of Moorish and black slaves is also widely documented. The African lineage found in some inhabitants of the Azores, albeit rare, has a higher incidence than among the general Portuguese population, implying that black slaves may have experience a higher level of integration with the Azorean population[19].

As is the case with much of the Azores, the dates of the discovery and early settlement of São Jorge are unknown, but it certainly happened in the wake of the settlement policy espoused by Prince Henry the Navigator in around 1430.

The island was definitely settled before 1483, when João Vaz Corte Real was granted the Captaincy of the Island of São Jorge[20].

It is impossible to determine who the first settlers of the island of São Jorge were, or where they came from. However, the first population centre has been pinpointed as Velas, while another is thought to have sprung up in Calheta, followed by a third core in Topo, which corresponds with the arrival of the Flemish nobleman Wilhelm van der Haegen (Guilherme da Silveira), over the course of the 1480s, following the failure of attempted settlement on the island of Flores.

With the island completely unexplored and given the extreme difficulty or lack of access to its interior, the first settlers naturally established themselves beside the sea, which provided the only means of communication with the other islands, and was often the easiest embarkation point for travelling to other parts of the island itself.

Nowadays, a number of industries are based on São Jorge.

Agriculture permeates all of the island's communities, but the focus is on livestock, which is associated with São Jorge cheese production, and fish processing to produce canned tuna. Both of these industries play an extremely important role in the island's economy, due both to the high number of people involved in them and to the amount of revenue they generate.

Moreover, the tourism sector is also on the rise, and is mainly linked to outdoor activities, bringing more and more visitors to the island and driving development in other sectors such as accommodation, catering, craft and entertainment.

19 Manuela Lima (2008), Povoamento e história demográfica dos Açores: o contributo da genética. Boletim do Núcleo Cultural da Horta, 17, 227-241 pp.

20 Letter of Endowment written on 4 May 1483.

Figure 29. The ferryboat Gilberto Mariano in the port of Velas

Figure 30. The airport on the island of São Jorge

10.5. NAME(S) OF THE MAJOR SETTLEMENT(S) WITH IN OR NEAR THE PROPOSED BIOSPHERE RESERVE

The island of São Jorge is divided into two municipalities for the purposes of administration. These are based in the towns of Velas and Calheta, which give the municipalities their name, and there are no cities within the area proposed for the Biosphere Reserve.

Due to its geographical position, the island of São Jorge is one of the vertices of a triangle formed by the islands of São Jorge, Pico and Faial, commonly known as the "Triangle Islands".

The closest city to the Biosphere Reserve is Horta, on the island of Faial, which lies about 40km (21.5 nautical miles) from the town of Velas. The city of Horta is only reachable by sea or air, and there are regular boat and aeroplane connections. In 2011 the city of Horta was home to 6,118 of the 14,998 inhabitants of the island of Faial.

It is also worth noting the proximity of São Jorge to the island of Pico (it is 10.8 nautical miles between the ports of Velas and the Cais do Pico), which had a total of 14,148 inhabitants in 2011, and São Jorge's historical relationship with the island of Terceira (56,437 inhabitants), which is home to the city of Angra do Heroísmo, designated a UNESCO World Heritage Site.

Figure 31. Small house in the Fajã d´Além (north)

10.6. CULTURAL SIGNIFICANCE

When the island of São Jorge was first discovered by the Portuguese it was uninhabited. The way in which the territory was settled was strongly influenced by the island's topography, with the settlers having to adapt and shape their lives according to the conditions there.

This situation had an impact on the culture and development of the island, insofar as its communities evince a close relationship with the land and the sea to this day. Agriculture, livestock farming and fishing continue to be the foremost economic activities.

Due to their isolation in the middle of the Atlantic and the difficulties in communicating with other towns and islands, the settlers maintained their culture of origin and blended it with those of others to create their own culture, which manifested itself in farming practices, architecture, planning, the landscape, clothing, ways of speech, religious traditions, and their celebrations and festivities.

Today, with communication now much easier, the unique features of the culture of the people of São Jorge are becoming less marked, but many of them still hold, although some are just traces of their original form.

This is the case with the leasing of land in exchange for milk, a Flemish tradition still prevalent on the island of São Jorge, and which is thought to have been introduced by the Flemish nobleman Wilhelm van de Haegen (Guilherme da Silveira) in the late 15th century.

The need to use the little land available for agriculture meant that the people, having settled in the highland areas of the island, where there were pastures and cattle but poor conditions for agricultural production, began to cultivate vegetable gardens around the *fajãs*. This situation, combined with island's topography, led to a practice known as "mudas" ["shedding"]. According to this tradition, people completely pack up their lives at their homes within the island's parishes (in the highlands) and move to their *fajã* houses (normally a winery or small house consisting of only a kitchen and a bedroom). These "mudas" are more common in the winter, when the high terrain of the island becomes unfavourable for agricultural production and creates unpleasant living conditions, and in late summer, around the time of the grape harvest, when the *fajãs* are bustling with people.

Figure 32. Mooring for the "wood run" on the Fajã da Caldeira de Santo Cristo

Figure 33. São Jorge Cheese Guild

Since most of the space on the *fajãs* was set aside for agricultural production, people used the forests on the slopes of the *fajãs* to obtain the wood that was used as fuel for everyday activities, in particular for baking bread and cooking food. The typically craggy terrain and steep slopes made it impossible for people to transport the wood themselves, so cables were installed along the hillside, allowing loads to be drawn down or carried up. These were known as "fio-de-lenha" ["wood runs"].

São Jorge cheese is undoubtedly the island's most renowned product, and it is associated with what remains the island's main economic activity – the production and processing of around 30 million litres of cow's milk. It has been classified as a Protected Designation of Origin (PDO) since 1986, and is certified as such by the Confraria do Queijo de São Jorge [São Jorge Cheese Guild].

Yams are another historically and culturally important agricultural product on the island of São Jorge. Cultivated in every parish, they started out as a product vital for the livelihoods of the poorest members of the population, and yam cultivation was recorded on the island from the late 17th century.

The costs arising from the Portuguese Restoration War[21] could not be covered simply by collecting existing taxes, which were based on products with a high commercial value, such as cereals and meat, so various mechanisms for generating tax revenue were reinforced and new products began to be taxed, including "miunças" and "ervagens", which referred to the tithe[22] on all vegetables, the grass for the cattle and other minor agricultural products.

However, yams were never subject to tax until 1692, when Francisco Lopes Beirão pressed for a tithe on "miunças" and "ervagens" from the island of São Jorge for 3 years, and ordered penalties to be exacted against those who defaulted. In 1694, in the face of

21 The Portuguese Restoration War was a series of armed conflicts that took place over 28 years (1640–1668) between Portugal and Spain, with the exception of Catalonia.

22 Levy or tax corresponding to 1/10 of production.

Figure 34. Detail of the yam leaves on the coat of arms for the Calheta municipality

Figure 35. Detail of yam leaves on a traditional-style pavement in the town of Calheta

repeated non-payment, he asked the municipal authorities to make the payment of the tithe compulsory, forcing the farmers to start transporting yams from the fields to the place of collection[23].

As they refused to carry the yams on their backs from the *fajãs* to the parish, the farmers demanded that the collector take the tithe from the place where it was harvested, as was done with other products. Faced with this intransigence, in 1694 Francisco Lopes Beirão requested that the "Almoxarifado" (fiscal agency of the Portuguese crown) in Velas cover the tithe in yams from 1692, 1693 and 1694. This was seen as an intolerable example of interference in Calheta's municipal affairs, and created conflict between the two municipalities. This was followed by a siege by the people of Norte Pequeno to around 40 men from the Velas almoxarifado who, due to the popular revolt, had to take refuge in the church of Nossa Senhora das Neves.

As his attempt to collect the tithe from the Velas almoxarifado had failed, Francisco Lopes Beirão sought support from the Crown, which in 1695 ordered the sentencing and imprisonment of those responsible for the rebellion. Faced with continued resistance from the islanders, in June 1696 the magistrate João de Soveral e Barbuda, accompanied by a military force of 50 soldiers sent from Terceira, began a campaign of arrests and interrogations, having declared the rebels and the Calheta authorities who defended them guilty. Those convicted were arrested and their assets seized in order to pay the tithes in arrears, along with the respective interest and other expenses for the magistrate, soldiers and judges.

The importance of this episode is evident in the yam leaves depicted on the Calheta municipality's coat of arms and on some cobblestones on the pavements in the town of Calheta.

23 This was an unusual situation, as – to take some examples – wheat was collected from the threshing floor, corn from the gate of the farm and wine from the winepress.

Figure 36.
Cultivation of vines on the Fajã de São João

Figure 37.
The whaling boat São José in Topo port

Although today it is almost negligible, the wine industry once played an extremely important role in the economy and lives of the islanders. The first vineyards were cultivated on the *fajãs*, in particular on the south coast, with Casteletes in Urzelina being the best-known site for the production of good quality wines.[24] The vineyards mainly cultivated Verdelho and Terrantez grape varieties.

In 1801[25] the Capitan General of the Azores ordered that all of the barrels containing wine for export to bear the mark "S. Jorge", in acknowledgement of the high profile of wine from São Jorge and in order to prevent speculation. This was the first denomination of origin to be set out for an Azorean wine.

In the second half of the 19th century the vines were attacked by plagues of powdery mildew and phylloxera, almost completely obliterating wine production on the island of São Jorge.

To turn now to the ocean, apart from fishing, which is still quite prevalent, it is also worth pointing out the sociocultural importance of whaling on the island of São Jorge.

Whaling began in the seas off the Azores in the second half of the 18th century with the arrival of whaling ships from the USA. Men were recruited from the islands to help form crews, and the Azoreans learned the necessary techniques aboard these boats[26]. The mid-19th century saw the start of shipbuilding for Azorean whaling boats, which drew upon the experience of those men.

On São Jorge, whaling boats were first built in Topo, in 1880, and whaling was very important for that area right up until it was abolished in 1965. Today the local "Cachalote" association has restored a whaling boat, and uses it in sailing and rowing regattas.

24 According to certain writers – Avellar, J.C.S. (1902) and Sousa, J.S.A. (1822) – the Casteletes wine was the best Azorean wine at that time.

25 Carried out on 9 March 1801.

26 This is something very evident in Azorean whaling vocabulary, which consists almost entirely of Anglo-Saxon foreign words.

Figure 38.
Império do Espírito Santo chapel, Topo

Figure 39.
Procession with the symbols of the Holy Spirit, Velas

Figure 40.
Ox-drawn cart decorated for the Holy Spirit festivities

In terms of religion, the cult of the Holy Spirit (the third person of the Holy Trinity) was introduced in the 15th century by the first settlers from the Portuguese mainland[27]. Faced with epidemics that decimated a swathe of the population and various natural disasters (earthquakes and volcanic eruptions), the local people implored the help of the Holy Spirit by marking feast days and giving soup to the poor.

The Holy Spirit festivals that take place in the eight weeks between Easter Sunday and Trinity Sunday are the most heartfelt expression of Azorean religiosity, and occur across the islands, but with unique features from place to place.

One element associated with this cult is the "Impérios do Espírito Santo", buildings constructed for the purpose of displaying its various symbols: a royal crown surmounted by a dove, a platter, a sceptre, and a banner and rods.

On the Sunday before the coronation, the symbols of the Holy Spirit (the crown, the platter with the sceptre, and the banner and rods) are taken to the home of the major-domo. A makeshift altar is set up there for the crown, and it remains there for a week. On the day of the coronation, the symbols are taken in a procession to the church, where the coronation takes place, and from there to the place where the "soup" is served.

Bread, milk and sweet lupins[28] are transported on exquisitely decorated ox-drawn carts to the festivities area, where they are distributed.

27 Following the tradition instituted by Queen Isabel in the late 13th century.

28 The sweet lupins are cooked on the Thursday before the symbols are taken to the major-domo's house and then placed in bags of sackcloth and plunged into the sea, where they soak up flavour until the Saturday of the Holy Spirit.

Figure 41. Church of Santa Bárbara, Manadas

Figure 42. Interior of the Church of Santa Bárbara, Manadas

Figure 43. São Jorge Museum of Sacred Art in Velas

Figure 44.
"Portão do Mar" on the pier in the town of Velas

On 26 June 1980[29] the importance of this cult and the festivities surrounding it across the whole archipelago prompted the Legislative Assembly of the Azores to make the Monday of the Holy Spirit the Day of the Autonomous Region of the Azores, and thus a regional holiday.

São Jorge's religious heritage also includes numerous churches and chapels that are spread throughout all of the island's parishes and in a number of *fajãs*.

Despite the simplicity and sobriety of its façade, the Church of Santa Bárbara in Manadas parish contains a magnificent collection of religious art. The entire ceiling of its nave and a significant portion of the church's decoration is made from the wood of cedro-do-mato (*Juniperus brevifolia*). This astonishing baroque temple is one of the most valuable examples of Azorean heritage and has been classified as a National Monument since 5 January 1950[30].

Meanwhile, the São Jorge Museum of Sacred Art, located in the Mother Church of Velas, has a vast collection of statues, paintings, religious adornments, furniture and vestments from various historical eras.

Among the island's military constructions, the island of São Jorge contains a set of fortifications built to protect the people from attacks by corsairs are particularly noteworthy. The "Portão do Mar" ["Sea Gate"] on the quay in Velas is one such structure, and was rebuilt between 1797 and 1799 as part of the town's defences, allowing the walls to be closed by gates.

The civic buildings on the island of São Jorge reveal influences from abroad from over the centuries. Like the settlers, those influences originate from various regions of Portugal and from other European countries.

29 Regional Decree no. 13/80/A, 21 August.

30 Decree no. 37.728, published in the Official Gazette, Series I, No. 4, of 5 January 1950.

Figure 45. The "Solar dos Tiagos" in ruins, Topo

Figure 46. The "Solar dos Tiagos" after restoration, Topo

Figure 47. Windmill on Urzelina

Figure 48. Water mill in Fajã de São João

Figure 49. Looms and typical quilt from the island of São Jorge

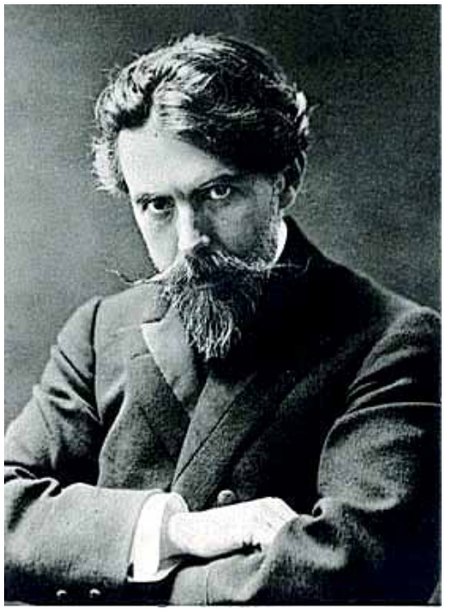


Figure 50. Maestro Francisco de Lacerda

The "Solar dos Tiagos", a manor-house in Topo, is a clear example of the Flemish influence on São Jorge's architecture. The building, which was in ruins, was recently restored and converted into a space for public use. The Flemish nobleman Wilhelm van der Haegen (Guilherme da Silveira) was buried in the chapel next to the Solar.

With respect to built heritage on São Jorge island, its mills are worth highlighting. Powered by wind and water, these structures were crucial for processing locally produced grains.

Weaving is one of the earliest and oldest traditional industries in the archipelago, serving as an effective response to the limitations imposed by the islands' isolation. Looms were present in nearly every house on São Jorge and weaving played a key role in everyday rural life in the production of quilts and fabric for clothing.

Artisans on the island of São Jorge are responsible for creating one of the most typical expressions of popular art – high point quilts that favour the use of geometric motifs and the natural or bright colours typical of Azorean folklore. Today, these colourful quilts are made with mechanical looms using ancient techniques.

In the field of the arts, one of the towering figures in Azorean culture is Francisco de Lacerda, who was born in the parish of Ribeira Seca on 11 May 1869, and died in 1934.

From a young age, Francisco de Lacerda displayed a gift for music, and later abandoned his medical studies in order to enrol at the Royal Conservatoire, in Lisbon, where he completed the general piano course in 1891, before becoming a teacher at the same conservatoire.

In 1895 he travelled to Paris on a scholarship, and later became an orchestra conductor. Although this remained his main line of work, he also made numerous studies of traditional music, musical direction and music history.

Francisco de Lacerda left a rich legacy, and due to the rigorous academic training that he received and the cultural milieu in which he thrived, his work is marked by a unique, personal touch that makes him a precursor of Impressionism in Portugal and a figurehead for the nationalist movements in European music in the late 19th and early 20th centuries.

Figure 51. The Nova Aliança Philharmonic Band playing in a festival in Velas

Figure 52. Beira Folklore Group, São Jorge (2009)

Between 1913 and 1921 he lived on São Jorge due to family problems, and moved to the Fajã da Fragueira, where he made a number of studies of folk traditions and Portuguese music.

The first philharmonic orchestra on the island of São Jorge, the Filarmónica União Popular da Ribeira Seca[31], was founded in 1854 and also had close ties with the Lacerda family.

Since then a number of other orchestras and bands have been formed, and there are currently around eighteen of them across the whole island.

Over time, these orchestras and bands have tended to play a key role in the musical education of the local people, as well as bringing excitement to local festivals with the concerts that they put on throughout the year.

Another form of expression of popular Azorean culture is the island's traditional music groups. Over time, São Jorge has received influences from the mainland, but also from the islands of Pico and Terceira. The foremost instrument in this tradition is the "viola da terra"[32], but the groups also use mandolins, guitars, and sometimes the violin.

The most typical song in traditional São Jorge music is "Saudade" (melancholic longing for something absent).

In addition to São Jorge cheese, one of the highlights of local cuisine are the clams from the Fajã da Caldeira de Santo Cristo lagoon, which are known for their unique size, flavour and texture. The lagoon is the only place in the Azores where these clams are found and they can only be harvested with a specific licence. Harvesting is prohibited from 15 May to 15 August.

As for desserts, the unmistakeable "espécies" are definitely worthy of attention. A horseshoe-shaped pastry dotted with tiny fillings, its name is derived from the fact that the dessert is flavoured with spices, including fennel, cinnamon and pepper.

Over the years, sport has been a constant presence in the lives of the islanders, with an emphasis on football. More recently,

31 Founded with instruments provided by José Pereira da Cunha da Silveira e Sousa.

32 Also known as the "two-hearted viola", this is a typically Azorean instrument, because although it was introduced in the late 15th or early 16th centuries, it underwent a number of alterations by local craftsmen, making it very different from violas from the Portuguese mainland that had the same origins.

Figure 53. A plate of clams from the Fajã da Caldeira de Santo Cristo lagoon

Figure 54. "Espécies" - a typical regional cake of São Jorge

Figure 55. The judoka Tiago Rodrigues, national champion in 2014

however, there has been a marked upsurge the popularity in judo due to the work of the Judo Clube de São Jorge. This led to one of its members, Tiago Rodrigues, winning the title of National Judo Champion 2014 in the – 90kg category.

Ongoing improvement in the living conditions of the islanders together with the conservation of the island's natural and cultural features are the only way of ensuring that the identity of São Jorge can be preserved, and making sure that those who live and work there will have a prosperous future and a good quality of life. The proposed Biosphere Reserve is a vital element of that process of sustainable development.

10.7. SPECIFY THE NUMBER OF SPOKEN AND WRITTEN LANGUAGES IN THE PROPOSED BIOSPHERE RESERVE

On the island of São Jorge, which is an integral part of the Autonomous Region of the Azores and of Portugal itself, the only official language is Portuguese.

11. BIOPHYSICAL CHARACTERISTICS

11.1. GENERAL DESCRIPTION OF SITE CHARACTERISTICS AND TOPOGRAPHY OF THE AREA

The island of São Jorge, which is entirely integrated into the proposed Biosphere Reserve, is situated in the North Atlantic Ocean about 1,815 km from Continental Portugal.

This island, which belongs to the Central Group in the Azores archipelago, is about 55 km in length, has a maximum width of 7 km (between Fajã das Pontas and Portinho da Calheta) and covers an area of 246 km^2 and close to 140 km of coastline. It is the fourth largest island in the archipelago. Its highest elevation is Pico da Esperança at 1,053 metres. Its rugged coastal cliffs, which measure 700 metres tall on average, make for a unique, highland landscape.

São Jorge is also noted for its distinct features in terms of elevation, including extensive areas of highland meadows and peat bogs and scrubs on coastal cliffs.

Meadows succeed Laurel forests [*Macaronesian mesophile grasslands* (6180)] and are associated with humid, deep soils, zones highly exposed to wind, low light conditions, heavy rainfall, permanent flooding and low temperatures. Most of the peat bogs are ombotrophic; that is, they are fed by rainwater. Acidic and low in nutritive minerals, their vegetation is dominated by sphagnum mosses.

The existence of the peat bogs appears to be associated with control of the hydrological system through their ability to capture and retain water in the soil and reduce water loss. The moss retains up to 20 times its weight in water and releases it slowly, allowing other plants to make use of it. This gradual releasing of water helps reduce the effects of torrential streams, thereby stabilising the hydrological system and preventing landslides.

Figure 56. RAMSAR sites on São Jorge Island

The coastal cliffs contain extremely productive ecosystems that are highly resistant to wind and salinity and are vital for many life cycles.

The combination of high altitude and coastal ecosystems has resulted in a wealth of endemic terrestrial flora, of which 60 species are native to São Jorge. These ecosystems provide excellent habitat for a diversity of invertebrate, terrestrial arthropod, mollusc and bird species.

São Jorge's wetland ecosystems appear to be linked to coastal and high elevation lagoons, which have been classified as sites of international importance under the RAMSAR Convention due to their extreme importance for biodiversity preservation. The coastal lagoons on Fajã dos Cubres and Fajã da Caldeira de Santo Cristo are particularly important for their formations, which are unique on the archipelago and rarely found elsewhere in the world.

Meanwhile, the topography and bathymetry of the Azores islands oceanic depths is linked to the archipelago's formation and the geodynamic evolution of the North Atlantic Ocean. The nine Azores islands are volcanic in origin and emerged from a vast platform that was topographically uneven, irregular, rugged and shallow – The Azores Plateau.

Due to the archipelago's volcanic nature and the steep bathymetric gradient of the surrounding undersea area, the slopes of these structures are predominantly characterised by exposed rocky surfaces, in contrast to the layer of sediments present on the abyssal plain.

São Jorge and other islands in the Azores are situated on the northern edge of the North Atlantic Gyre, which is characterised by a high horizontal temperature gradient and is highly influenced by the Gulf Stream, which brings bodies of warm surface waters from the equator and the western tropics to the cold waters of the North Atlantic.

Sea surface temperatures vary as a result of seasonal changes in overall oceanic circulation patterns in the Azores. Throughout the year, temperatures are generally mild. Average monthly sea surface temperatures regularly vary between 15.2º C and 22.7º C. During the winter months, sea surface temperatures and temperature variations are at their lowest levels, while temperatures and temperature variations are at their highest in summer. Annual variation in sea surface temperature is approximately 8ºC throughout the entire Azores archipelago.

The formation and progression of oceanic waves is directly related to the intensity, persistence and area affected by wind. Although São Jorge sits on a narrow platform, its location in the middle of the North Atlantic exposes it to intense wave action, particularly during the winter months. During the summer months, wave action tends to diminish. Situated in the middle of the North Atlantic, São Jorge receives waves from various directions that can simultaneously converge in the same locale. According to data from the USNO (US Naval Observatory), waves coming from a West and North West direction are the most common in São Jorge, although waves from the South West are also frequent. During the summer, the biggest waves originate from the West, South West and North West directions, although waves from the North West give way somewhat to those from the South.

In São Jorge and other islands, tides are regularly semi-diurnal: in one day, there are two high tides and two low tides. Tide duration is essentially affected by wind force and duration, while atmospheric pressure has the greatest effect on tidal ranges (low pressures increase sea levels and vice versa). Tidal ranges are low, varying between 1 and 1.3 metres on average and rarely exceeding 2 metres.

Sea surface salinity varies between 35.9‰ and 36.5‰ and tends to decrease as depth increases, depending on the origin of different bodies of water.

The Azores archipelago is characterised as belonging to an essentially oligotrophic oceanic region whose reduced primary production is due to the low concentration of one or more limiting nutrients. This is because of the nature of the oceanic currents and the extreme depths registered in the archipelago, which cause most organic particulates to sink, leaving a paucity of nutrients at the surface. The upwelling of deep water surrounding the undersea mounts and islands, however, provides an additional source of nutrients for surface waters in the Azores.

Marine biodiversity in the Azores is determined by the region's geography, which is predominantly oceanic and has a temperate climate; the relatively youthful geology of the archipelago's islands; its small size; and the presence of extreme environments caused by hydrothermal sources. The island's oceanic nature, as well as the uneven topography of its oceanic depths, has meant that on many islands such as São Jorge, waters located close to the coasts are extremely deep. This favours large pelagic species and large invertebrates, fish and cetaceans, which have eventually integrated themselves more or less permanently into the insular coastal

dynamics. These conditions encourage the existence of different marine ecosystems with distinct habitats where complex marine food webs are formed.

Due to the uniqueness of their habitats, species and natural resources, the marine areas contained within Ponta dos Rosais, Zona Central, Topo and Velas are particularly noteworthy.

The western tip of São Jorge (Rosais) is a highly rocky area whose coast contains numerous coral reefs, caves and small sheltered bays. Highly exposed to storms and tidal currents, the waters surrounding it are affected by strong oceanic currents. Scattered throughout this area are islets and shoals. The predominant biotype is composed of canyons with extremely steep walls that extend into the submerged zone. The ocean floor is highly irregular throughout and contains several small caves and crevices. The biotopes found there are typical of very exposed areas.

Located in the Central Zone (northern coast) are Fajã dos Cubres and Fajã da Caldeira de Santo Cristo. Both *fajãs* contain coastal brackish lagoons, a rare habitat in the Azores. The lagoon at Fajã dos Cubres contains several very rare brackish water communities in the Azores (*Rupia maritima* and *Juncus acutus*) and is used by various species of wader (*Gallinago gallinago* - narceja, *Tringa nebularia* – perna-verde, *Tringa melanoleuca - perna-amarela-grande* and *Fulica atra* - galeirão). The lagoon at Fajã da Caldeira de Santo Cristo contains the only population of amêijoas (*Ruditapes decussatus*) that is commercially exploited in the archipelago. To the west of the lagoon is a small tidal pool (seawater percolates in and out through a barrier of stony banks) that provides shelter for various species of waders.

At Ponta do Topo, about 1.2 miles west of Pontinha, the area adjacent to the coastline is shallower, especially near Ponta do Gonçalo. Slightly east of Ponta do Topo is the islet of Topo, which is circular in shape and separated from São Jorge by a shallow strait of about 350 metres.

The Velas zone features the bays of Entre Morros and Arraias, located between Morro Grande and Morro de Lemos. These are sub-oceanic volcanic structures with fissured walls that were formed by Surtseyan tuff cones with several veins of basalt. Their sandy bottoms and rocky surfaces make this zone notable for its variety of species, particularly the crustaceans *Scyllarides latus* (cavaco), *Maja brachydactyla* (santola) and *Megabalanus azoricus* (craca), the mollusc *Patela spp.* (lapa) and *Octopus vulgaris* (polvo).

Human dependence on the ongoing, balanced functioning of the global ecosystem requires that management policies based on the sustainable use of water be encouraged and implemented. Such an approach is particularly important in insular zones that face territorial fragmentation and separation and a fragile biophysical balance, along with a relative scarcity of hydrological resources that have economic potential and can be exploited in an environmentally sustainable way.

On the Azores archipelago, the reduced size of its islands, the volcanic origins that have shaped its geomorphology and geology, and the specificity of its climate have caused surface drainage to essentially occur on a temporary (or intermittent) basis, often in the form of torrential runoff. Some islands, however, do contain perennial watercourses that depend on deep discharges from lakes or the presence of springs associated with perched aquifers.

Figure 57. Caldeira de Santo Cristo stream

Due to the high amount of rainfall it receives (mean annual precipitation is 2,416 mm), São Jorge is drained by a dense hydrographic system that whilst ideally placed on its northern slopes, comprises incipient, poorly structured watercourses and small basins. The main drainage divide runs along the island's general direction and demarcates the separation of waters between the northern and southern coasts.

Based on the predominant geomorphological units, the intermittent nature of the streams on the island's western section is highly influenced by recent volcanic morphology. In this context, watercourses have frequently been shown to be short, poorly embedded and running in parallel, except in cases where they form on top of pyroclastic deposits.

In the eastern section of São Jorge, watercourses develop obliquely against the island and are longer than those in the western section. Also worth noting is the existence of several streams near Serra do Topo that, albeit small, run perennially during the summer months, due to condensation from the fog typically found in that zone. These perennial streams include Vimes, Caldeira de Santo Cristo, São João and Lixívias, although none of them contain hydrographic basins larger than 5 km^2.

The main hydrographic basins on São Jorge Island are represented in the figure 58.

The estimated amount of surface waters available on the island of São Jorge are on the order of 103.5 hm^3/year.

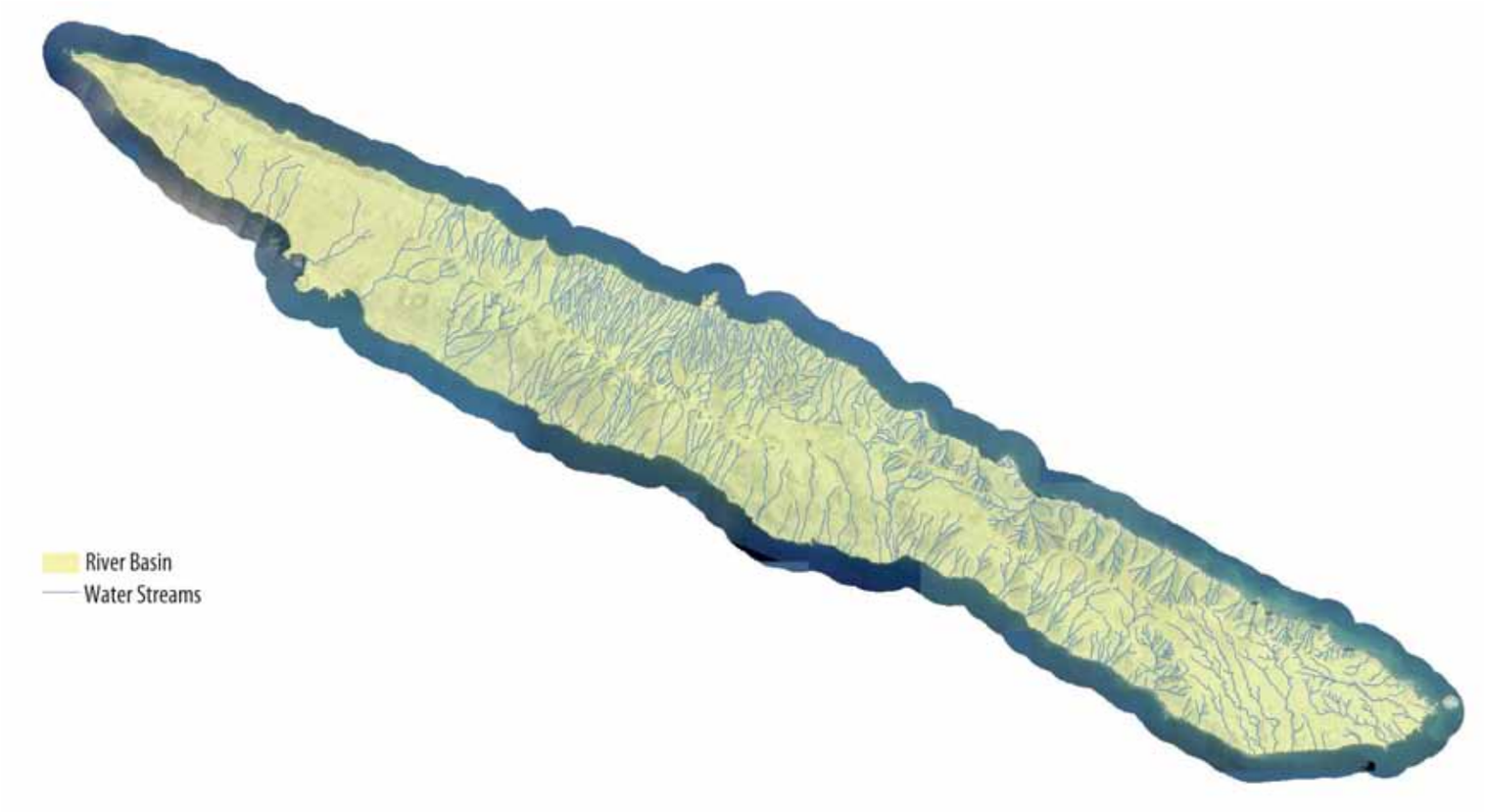


Figure 58. Hydrographic system on São Jorge Island

According to the criteria for the Water Framework Directive[33], the bodies of water found on São Jorge fall under the following categories: coastal waters, transitional waters and groundwater.

In terms of coastal waters, the three depth categories (shallow, intermediate, deep) are represented on São Jorge and on all other islands in the Azores archipelago.

In terms of transitional waters, a number of coastal lagoons on São Jorge that straddle terrestrial and marine environments constitute bodies of water that show intermediate features, particularly in terms of salinity, and are the only transitional waters classified in the Azores under the Water Framework Directive. This applies to the lagoons of Fajã dos Cubres and Fajã da Caldeira de Santo Cristo. These are small coastal lagoons with brackish waters that receive fresh water downstream runoff (mainly groundwater) and are ecosystems with highly unique characteristics. The lagoon at Fajã dos Cubres (which is divided into an eastern half, Cubres Este, and a western half, Cubres Oeste), is completely enclosed. It is essentially fed by salt water percolating through a boulder rampart, mainly on the northwest side, with a tidal amplitude of a few centimetres. The lagoon at Fajã da Caldeira de Santo Cristo remains open on its westernmost end, while the tidal amplitude is identical to that of the local tide (PRA, 2001b).

33 Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000.

Figure 59. Bodies of coastal water on São Jorge Island

Groundwater is an undeniably important resource in the Azores Autonomous Region, where practically all supply (98%) is derived from springs and wells. This percentage is considered extremely high, exceeding that of continental Portugal and other EU countries. This importance is also underlined by the fact that some islands, including São Jorge, are completely dependent on groundwater for their public water supply.

Three bodies of groundwater have been identified on São Jorge: Western, Central and Eastern. Water points on the island include 107 springs (0.43 springs/km^2) and 4 wells (0.02 wells/km^2). In terms of the distribution of springs, the Eastern, Central and Western bodies of water contain 45, 40 and 22 springs, respectively. In terms of the distribution of wells, the Central body of water contains 3, while the Western body of water contains only 1.

Figure 60. Bodies of transitional water on São Jorge Island

The volume of aquifer recharge indicates the existence of a total volume of subterranean hydrological resources on São Jorge amounting to 219.0 hm^3/year. This number is generally high. The most significant figure comes from the Central body of water, which amounts to 99.2 hm^3/year.

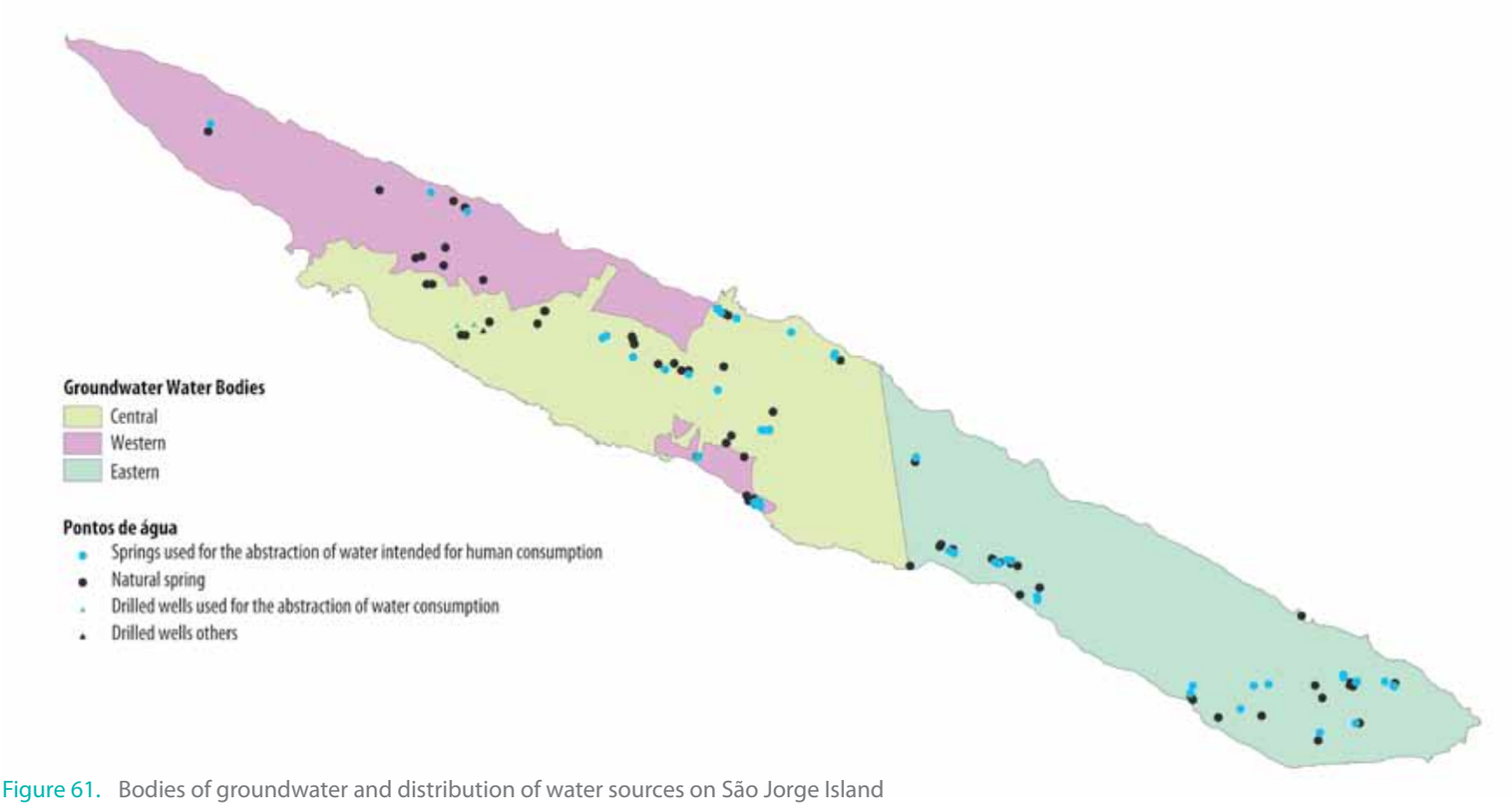


Figure 61. Bodies of groundwater and distribution of water sources on São Jorge Island

Table nº. 6 - Subterranean hydrological resources on São Jorge Island

MASSA DE ÁGUA	PRECIPITAÇÃO (hm^3/ano)	DISPONIBILIDADES (hm^3/ano)	TAXA DE RECARGA (%)
Oriental	237,68	45,63	19,0
Central	219,42	99,21	45,0
Ocidental	136,74	74,15	54,0

To safeguard unexploitable resources, 40% of estimated resources over the long term have been deemed off limits (i.e. recharge) so as to compensate for geological and hydro-geological constraints, while ensuring that a portion of the subterranean runoff feeds watercourses, which are particularly important during the driest months of the year. Hence, the portion of exploitable subterranean hydrological resources on São Jorge amounts to 60% of the total.

Water consumption on São Jorge requires nearly 1 million m^3 (1 hm^3) of water, which on average, represents 0.32% of the total available hydrological sources (322.5 hm^3/year). Even considering the available subterranean hydrological sources alone (since collected water volumes are obtained from subterranean sources), the subterranean water balance is highly positive, as hydrological needs are practically insignificant compared to the subterranean sources available (0.45%).

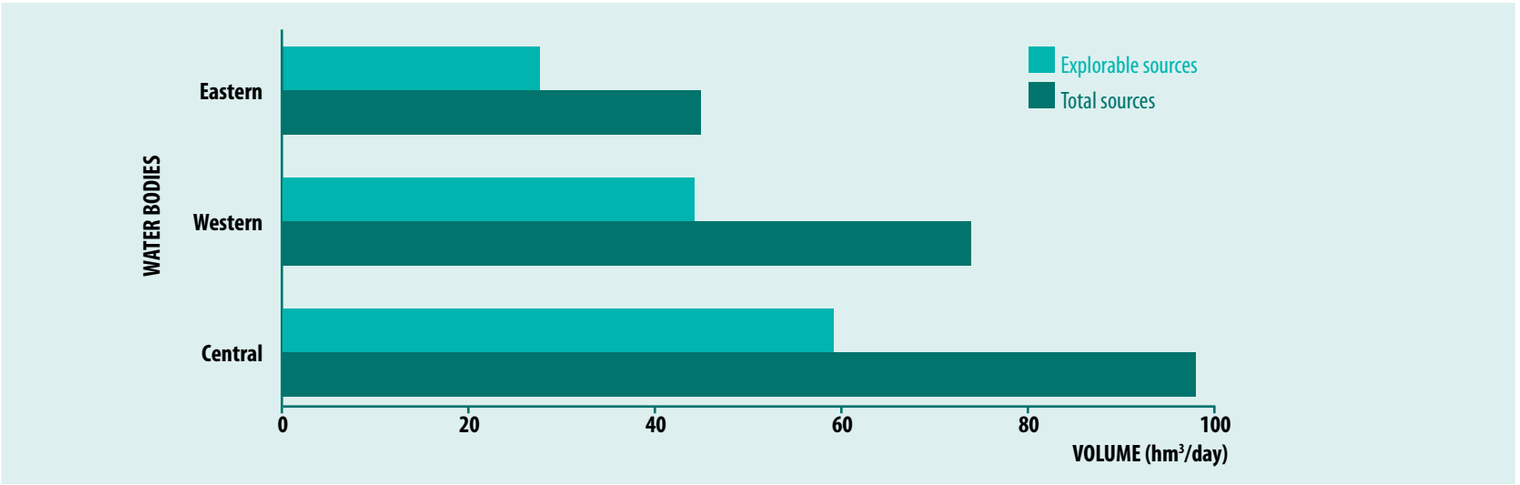


Figure 62. Distribution of available subterranean hydrological sources and volume of water bodies considered exploitable on São Jorge island

The challenge, therefore, is to meet the needs of today's society and its prospects for social and economic growth within a scenario of an increasing scarcity of water in acceptable quantities and qualities, while protecting the health of the aquatic environment and the service provided by the freshwater ecosystem.

11.2. ALTITUDINAL RANGE

11.2.1. HIGHEST ELEVATION ABOVE SEA LEVEL

Within the Fajãs de São Jorge Biosphere Reserve area, the highest elevation above sea level is 1,053 metres on Pico da Esperança.

11.2.2. LOWEST ELEVATION ABOVE SEA LEVEL

Within the Fajãs de São Jorge Biosphere Reserve area, the lowest elevation is at sea level (0 metres).

11.2.3. FOR COASTAL/MARINE AREAS, MAXIMUM DEPTH BELOW MEAN SEA LEVEL

Within the Fajãs de São Jorge Biosphere Reserve area, maximum depth is 410 metres at Entre Morros[34].

34 Extracted from http://www.navionics.com/en

11.3. CLIMATE

According to the Koppen climate classification, the Azores islands are in a transition between a Mediterranean climate (Csa) and a humid subtropical climate (Cfb). Precipitation is relatively high throughout the archipelago; however, it has a tendency to increase from E to W. Air humidity is also high, particularly at altitudes above 600 metres. On average, precipitation increases approximately 25% with every 100-metre increase in altitude.

Climatic conditions observed in the Azores archipelago are in large part a result of general atmospheric circulation in the North Atlantic. The state of the weather depends primarily on the development, direction and movement of the Azores anticyclone, as well as the subsequent interaction of air masses (tropical, maritime and polar).

São Jorge island is characterised as having a climate with a low temperature variation, high precipitation and air humidity, and a strong maritime influence.

Relative air humidity is high and increases by about 2% with each 100-metre increase in altitude, leading to saturation in the highest zones.

Fog occurs frequently above 800 m for most of the year. Average annual temperature hovers around 18ºC, while annual temperature variation is approximately 8ºC.

Prevailing winds come from the West, reaching the highest speeds during February and the lowest speeds in July.

11.3.1. AVERAGE TEMPERATURE OF THE WARMEST MONTH

August – 22ºC

11.3.2. AVERAGE TEMPERATURE OF THE COLDEST MONTH

December – 15.3ºC

11.3.3. MEAN ANNUAL PRECIPITATION

Mean annual precipitation in the proposed Biosphere Reserve area is between 1,340 mm and 1,512 mm, with the highest precipitation occurring in March.

11.3.4. IS THERE A METEOROLOGICAL STATION IN OR NEAR THE PROPOSED BIOSPHERE RESERVE? IF SO, WHAT IS ITS NAME AND LOCATION AND HOW LONG HAS IT BEEN OPERATING?

Climate data is recorded by the meteorological station at the São Jorge Airfield, which has been operating since March 1971.

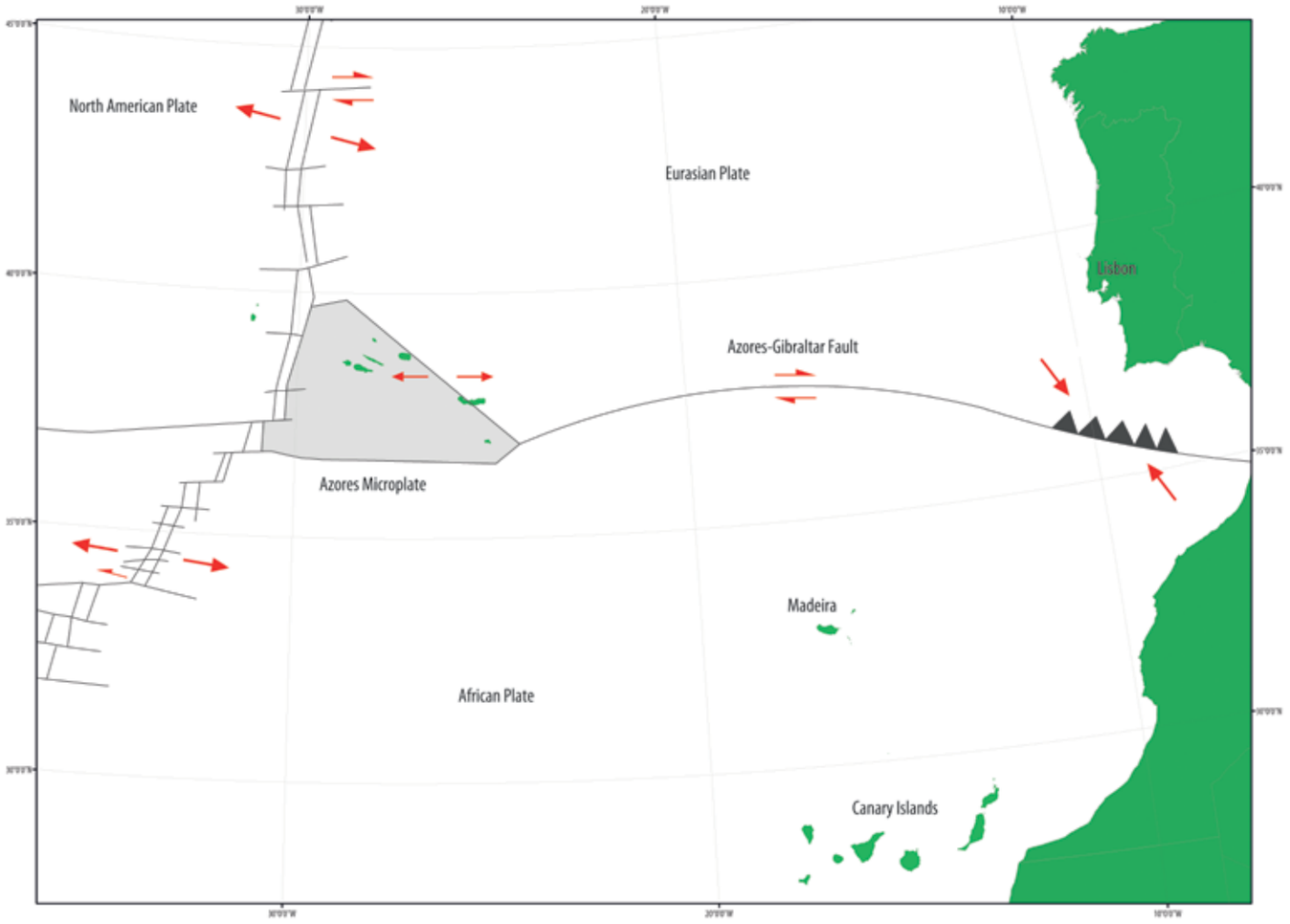


Figure 63. Azores Microplate

11.4. GEOLOGY, GEOMORPHOLOGY AND SOILS

São Jorge is located on the Azores Microplate at a junction where three tectonic plates (North American, African and Euroasiatic) meet, along a fault system running predominantly in a WNW-ESE direction parallel to the Terceira Rift.

These geotectonic conditions were what gave the island its elongated shape.

São Jorge shows a clear geomorphological expression of regional tectonic activity, displaying an alignment of Strombolian cones. The difference between the pronounced relief in the west and the much smoother morphology in the east enables two distinct regions to be characterised respectively as the Western Region and the Eastern Region, which are roughly separated by the Ribeira Seca valley.

Figure 64. Longitudinal topographic profile of São Jorge

Figure 65.
Tower of the old São Mateus Church in Urzelina, the only part that survived the 1808 eruption

The **Eastern Region** covers an area between Ponta dos Rosais and a border defined by Canada da Ponta to the north and Grota Funda to the south. This is a region that has experienced recent volcanic activity, as indicated by the well preserved shapes of several cones and the fresh appearance of the volcanic materials associated with it, and the fact that the eruptive centres of the 1580 and 1808 eruptions were situated there. The presence of more intense volcanic activity was a decisive factor that led to the higher altitudes found in the central and eastern portion of the region, particularly Pico da Esperança (1,053 metres). In contrast, on the extreme western end of the island, the absence of a similar process of volcanic construction enabled the sea's erosive effects to prevail, drastically affecting the island's surface near Rosais. Beyond the cones that emerged as a result of clear Strombolian activity, three cones associated with Phreatomagmatic, subaerial (Pico do Areeiro) and submarine (Morro Grande and Morro do Lemos) activity can still be seen.

Most of the cliffs on the NE side of the island are between 300 and 400 metres in height, with very steep inclines (45º to 55º). Various *fajãs* in this region are visible. Some of them are lava *fajãs* (Fajã do Ouvidor, Fajã das Pontas and Fajã da Ribeira da Areia), while others are detrital (Fajã de João Dias and Fajã da Penedia).

Spread out along the coastline, these *fajãs*, which are small extensions of land at the base of cliffs, with favourable soil conditions and climate, are one of the most distinctive features of São Jorge's topography.

The majority of *fajãs* resulted from water erosion or seismic activity that trigged landslides and forced materials to accumulate at the base, giving rise to the so-called detrital *fajãs*.

There are also lava *fajãs*, which are formed when lava is deposited into the sea, causing the coastline to expand. These areas are characteristically flattened and rocky.

Figure 66. Detrital fajã – Fajã da Caldeira de Santo Cristo

Figure 67. Formation of a detrital fajã

Figure 68. Lava fajã – Fajã das Almas

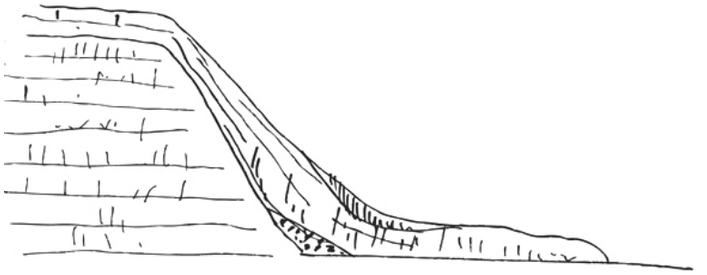


Figure 69. Formation of a lava fajã

Figure 70. Simplified geological map of São Jorge island

On the SW side, the cliffs show more variation in height, although all are at least 100 metres tall. Several lava *fajãs* are located along the coast, including Fajã das Velas, Fajã da Queimada, Fajã Grande and Fajã da Calheta.

Meanwhile, the **Eastern Region**, which is also the result of intense fissural activity, is notably older and prominently shaped by erosion. Here, the NE coast has retreated to the chain of axial cones, while the cliffs are higher than those in the Western region. The original morphology of the cones is more degraded, the effects of tectonic activity are more apparent and all of the *fajãs* are detrital due to the absence of recent volcanic activity. Watercourses are more deeply embedded in the relief, while the degree to which hydrographic basins are ranked is slightly greater than in the Eastern region.

Geologically speaking, the island can be characterised by different volcanic complexes, which in chronological order, are: The Topo Volcanic Complex, the Rosais Volcanic Complex and the Manadas Volcanic Complex.

The Topo Volcanic Complex is situated on the eastern part of the island and consists of basalt, hawaiite and mugearite (aa) lavas; these pyroclastic rocks are virtually limited to Strombolian cones. Numerous primordial fissural faults run along a NW-SE and WNW-ESE alignment. Dense soil cover has also been observed, which above 700 metres is peaty and saturated in water. Radiometric data[35] indicate that volcanic activity in this complex began more than 600,000 years ago.

Like the Topo Volcanic Complex, the Rosais complex contains lava flows that are mainly comprised of basalt and hawaiite (aa)

35 K/Ar data obtained by Feraud et al. (1980)

lava. Apart from constituting Strombolian cones, the pyroclastic rocks, which show evident alteration, are simultaneously dispersed between them, forming undifferentiated deposits. It has not been possible to observe any direct relationship between the materials in this complex and those of the Topo complex, as both lie underneath materials from the Manadas Volcanic Complex. However, the Rosais Volcanic Complex is well represented on the island's western end.

The Manadas Volcanic Complex is comprised of an alignment of more stratigraphically recent cones that trend in a WNW-ESE and NNW-SSE direction. Here, the volcanic products in this complex lie on top of those of the Rosais Volcanic Complex in the centre of the island and those of the Topo Volcanic complex in the Ribeira Seca zone. The cones in this complex are primarily Strombolian, although there are also two Surtseyan cones (Morro do Lemos and Morro Velho) in which palagonitization of submarine pyroclastic rock has been observed. Aside from these cones, several alignments of calderas and tuff ring cones resulting from phreatomagmatic activity can be seen. The latter are known for exhibiting a more or less flattened shape, while their craters are larger in size and the materials that constitute them are primarily comprised of ash.

Worth noting for their uniqueness in regions with basic volcanism is the fact that historical documents refer to the occurrence of phenomena known as "nuées ardentes" (glowing clouds) in the eruptions of 1580 and 1808[36]. Field research undertaken as part of the project "Study of Historic Eruptions in the Central Group – Azores", which refined maps of the eruptions that had occurred on the islands of Faial, Pico, São Jorge and Terceira, concluded that no deposits existed that would suggest a correlation with the formation of "nuées ardentes". However, it did acknowledge deposits of block and ash and scoria and ash that were formed in more distant geological periods (e.g. Pico Montanhoso and Pico do Carvão), which could have led to conal collapse under situations of gravitational instability[37].

36 Fouqué (1873).

37 Madeira (1998).

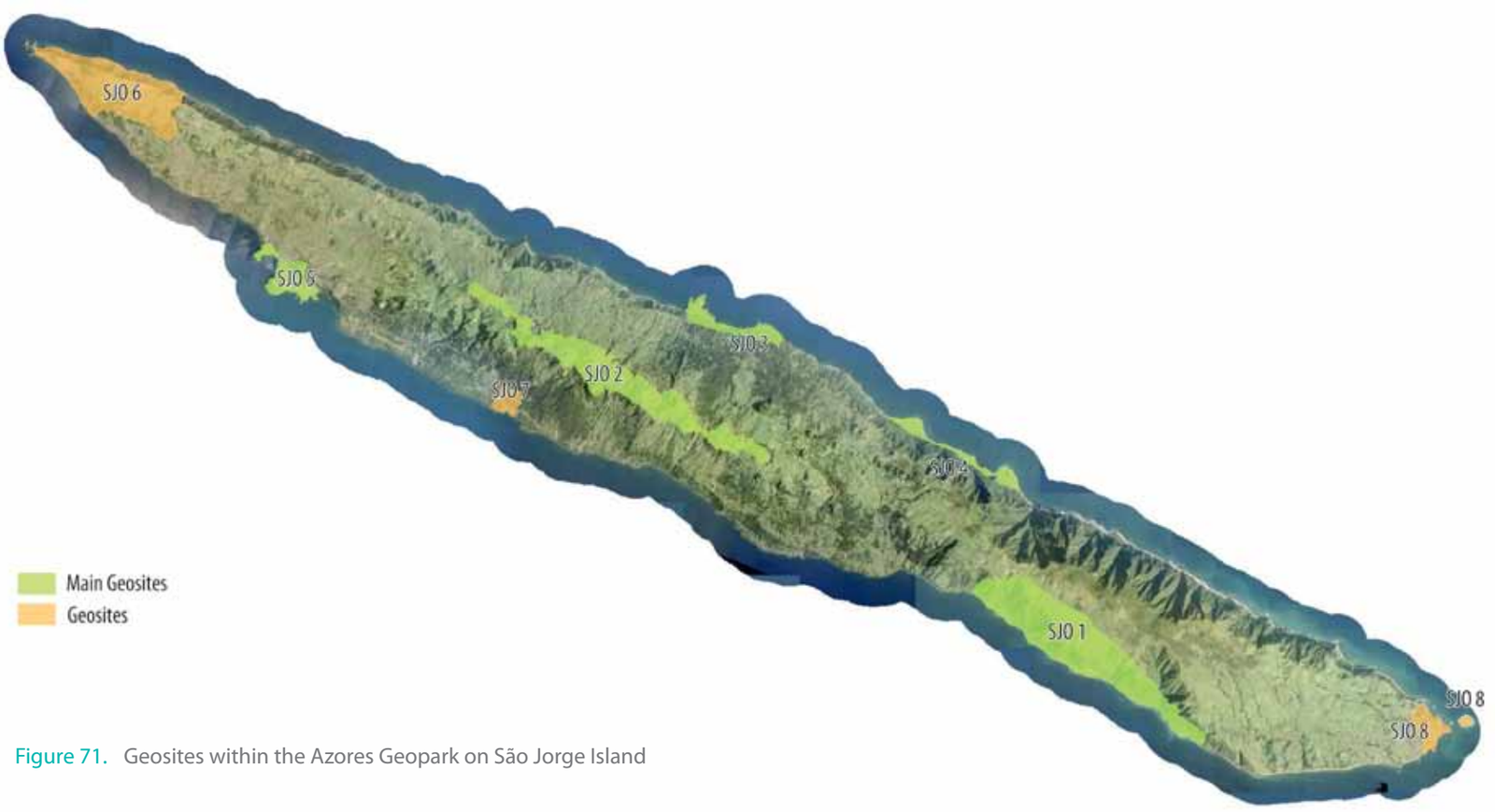


Figure 71. Geosites within the Azores Geopark on São Jorge Island

In São Jorge, five priority Geosites have been classified within the Azores Geopark, which has been a member of the European and Global Geoparks Networks since 2013. They are:

- **Arriba das Fajãs dos Vimes / São João (SJO 1)**, located in the parishes of Ribeira Seca and Santo Antão in the municipality of Calheta, covering an area of 6.63 Km² and an altitude of between 0 and 650 metres;
- **Central volcanic mountain range (SJO 2)**, located in the parishes of Norte Grande, Norte Pequeno, Urzelina, Manadas and Calheta in the municipalities of Velas and Calheta, covering an area of 8.37 Km² and an altitude of between 660 and 1,053 metres;
- **Fajãs do Ouvidor e da Ribeira da Areia (SJO 3)**, located in the parish of Norte Grande in the municipality of Velas, covering an area of 0.66 Km² and an altitude of between 0 and 270 metres;
- **Fajãs dos Cubres e da Caldeira do Santo Cristo (SJO 4)**, located in the parish of Ribeira Seca in the municipality of Calheta, covering an area of 1.31 Km² and an altitude of between 0 and 150 metres;
- **Morro Grande de Velas and Morro de Lemos (SJO 5)**, located in the parish and municipality of Velas, covering an area of 1.82 Km2 and an altitude of between 0 and 279 metres;

Figure 72. Algar do Morro Pelado

Figure 73. Furna das Pombas, Urzelina

The volcanic nature of the Azores archipelago offers a remarkable geodiversity, which is well reflected in its speleological richness. Around 272 natural caves are known to exist in the archipelago, encompassing many kilometres of underground paths, where strange life-forms and secrets lie hidden. The underground caves can be divided into the following groups: lava caves or lava tubes, which can be terrestrial or submarine; volcanic pits; fractures and erosional caves.

GESPEA (Grupo para o Estudo do Património Espeleológico dos Açores [Group for the Study of the Speleological Heritage of the Azores]) lists 19 volcanic caves on the island of São Jorge in its database: Algar das Bocas do Fogo, Algar do Morro Pelado, Furna da Reta da Cruz, Gruta da Beira, Gruta da Ribeira do Almeida, Algar dos Suspiros I, Algar dos Suspiros II, Algares do Pico da Maria Pires, Furna da Preguiça, Furna da Vigia I, Furna da Vigia II, Furna das Pombas, Furna do Poio, Gruta da Canada do Pedrosa, Gruta da Lomba do Gato, Gruta do Cerrado dos Algares, Gruta do Leão, Gruta das Três Bocas, and Gruta dos Encantados.

Of these, Algar do Morro Pelado and Algar das Bocas do Fogo are noteworthy for their height, at 140 and 120 meters, respectively, while Gruta da Beira and Gruta do Leão are noted for their length, at 200 and 177 meters, respectively.

With respect to troglobian species, Gruta da Beira is remarkable for hosting two endemic species in the Azores that dwell exclusively in this cave: the pseudoscorpion *Pseudoblothrus oromii Mahnert* and an as yet undescribed species of isopod (*Crustacea, Isopoda*). Algar do Morro Pelado contains a ground beetle, *Trechus isabelae*, which is only known to exist in this cave.

11.5. BIOCLIMATIC ZONE

Table nº. 7 - Aridity index resulting from the use of P/ETP

AREAS	MEAN ANNUAL PRECIPITATION (mm)	ARIDITY INDEX		CORE AREAS	BUFFER ZONES	TRANSITION AREAS
		PENMAN	(UNEP INDEX)			
HYPER-ARID	P<100	<0,05	<0,05			
ARID	100-400	0,05-0,28	0,05-0,20			
SEMI-ARID	400-600	0,28-0,43	0,21-0,50			
DRY SUB-HUMID	600-800	0,43-0,60	0,51-0,65			
MOIST SUB-HUMID	800-1200	0,60-0,90	>0,65	100%		
PER-HUMID	P>1200	>0,90			100%	100%

Mean annual precipitation (P) / mean annual potential evapotranspiration (ETP)

11.6. BIOLOGICAL CHARACTERISTICS

According to the Azores Autonomous Region's Land Use Map, published in December 2007, the archipelago's islands contain similar land use patterns. Pastures (permanent pastures) are predominant, representing nearly 42% of all land use. Forested areas (comprised of Japanese cedar, eucalyptus, pine, acacia and sweet pittosporum trees) make up more than 22% of land use in the Azores, which include areas on the islands of Pico and São Jorge. Agricultural areas (which cover arable crops, permanent crops, other crops, grains, tea, pineapple grown in greenhouses, orchards, vineyards, yam, beets and tobacco) make up about 14% of land use, most of it on the island of Graciosa. Areas of natural, that is, endemic vegetation and forests, which make up close to 13% of land use, are the richest in terms of variation in the region and best represented in the Western Group of islands.

Urban areas (cities, villages, airports, airfields, roads and ports) take up nearly 5% of regional territory, mostly concentrated on the islands of Terceira, Santa Maria and São Miguel. Exposed areas include the archipelago's coastal cliffs, which are predominantly rocky and contain a low density of vegetation cover, and mineral exploration zones, which make up nearly 2% of the territory in the Azores. In terms of the area occupied by lagoons, these are only found on four islands – São Miguel, São Jorge, Flores and

Corvo. Heathlands (Barreiros de Santa Maria, areas containing recent lava flows and the Pico sandpits) are scarce in the region, making up only 0.4% of the territory on the islands of Pico and Santa Maria. Finally, industrial areas (which include industry and infrastructures for producing energy, collecting, treating and storing water, and treating waste) make up only about 0.3% of the land use in the region and are prominent only on the islands of São Miguel, Terceira and Santa Maria.

On São Jorge, pastures and forests take up the highest proportion, at 46% and 26%, respectively, in comparison to industry (0.05%), lagoons (0.06%), urban use (2.70%) and exposed areas (3.30%). In terms of agricultural use, São Jorge has one of the lowest rates in the region at 6.85%, concentrated mainly in the *fajãs*. Finally, natural vegetation makes up 14.71% of land use.

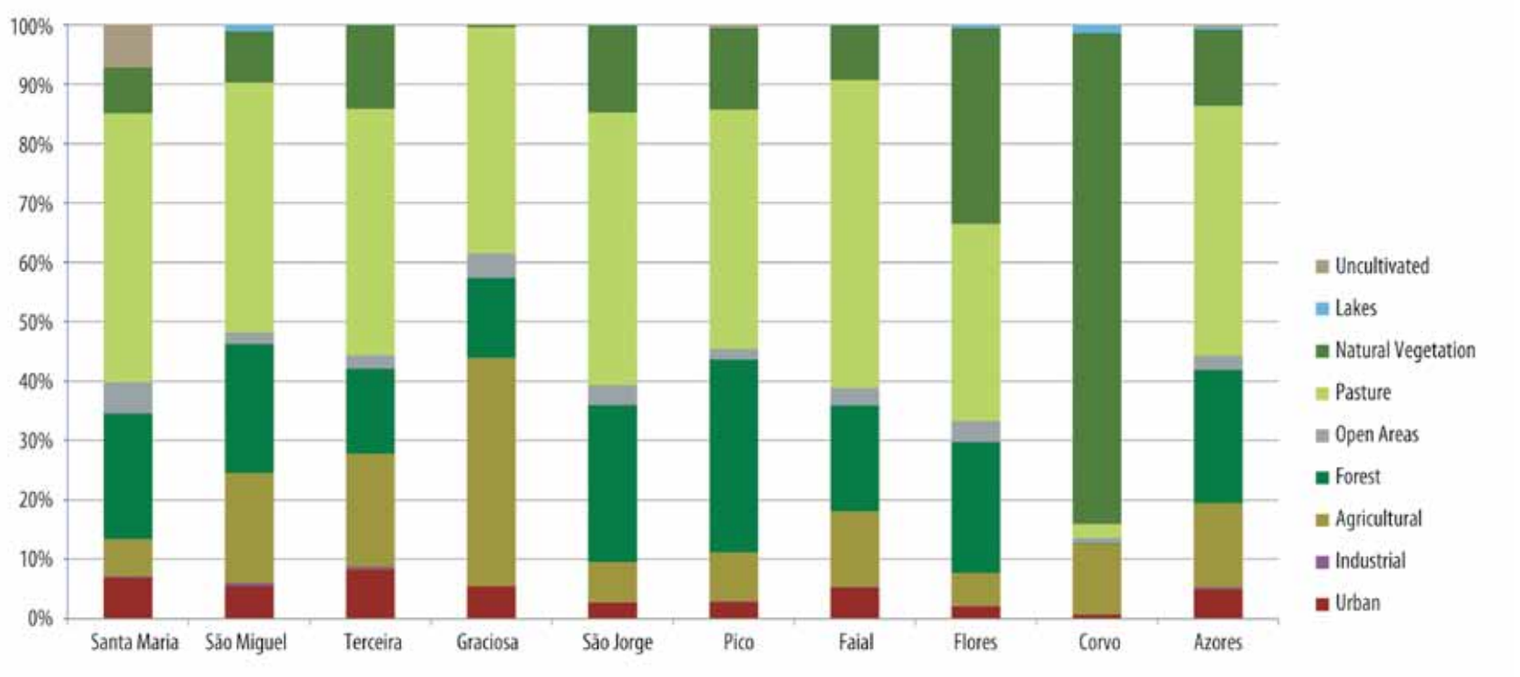


Figure 74. Land use in the Azores Autonomous Region

In the case of the terrestrial portion of the Core Areas in the proposed Biosphere Reserve, forest use makes up the largest area at 2,130 hectares (48%), followed by natural vegetation at 1,435 hectares (32%). In contrast, lagoons make up 15 hectares (0.3%), urban use 24 hectares (1%), exposed areas 237 hectares (5%), pasture 530 hectares (12%) and agricultural areas 81 hectares (2%). In other words, areas covered by forests and natural vegetation make up 70% of land use in the terrestrial areas of the core areas, which is representative of the protected status of these areas.

In general, one can say that on São Jorge island, pasture is situated in higher, flatter areas, while forests are mostly located in the steepest areas. Natural vegetation is most abundant in the island's central mountain range, while agricultural use is essentially focused on lower altitude areas close to the sea, especially in the *fajãs*.

Figure 75. Land Use Map of Azores - São Jorge Island

Figure 76. Peat bog on the Central Plateau of São Jorge

Figure 77. *Tolpis azorica*

▶ TYPICAL SPECIES

The highlands are clearly dominated by pastures and areas for silviculture, with the latter completely dominated by *Cryptomeria japonica* (criptoméria). However, areas such as the Serra do Topo / Pico da Esperança green corridor are dominated by peat bogs afforested with *Juniperus brevifolia* (cedro-do-mato) and *Calluna vulgaris* (rapa).

There is a great diversity of wetland communities, ranging from pure Sphagnum (*Sphagnum spp.*) bogs, fens or afforested bogs, ponds and marshes. São Jorge's peat grasslands contain one of the highest numbers of valuable natural heritage features, in terms of the number of endemic and rare species and levels of biodiversity.

These areas contain an extremely high concentration of rare species. Species of note include *Ammi trifoliatum* (pé-de-pomba), *Chaerophyllum azoricum*, *Ranunculus cortusifolius* (bafo-de-boi) and *Tolpis azorica*.

There are also ponds and lakes that, albeit small in most cases, are of great importance, hosting several migratory freshwater bird species.

In addition to the wetland typologies already identified in this area, there are also pockets of natural habitat of great ecological importance, as well as mixed use systems that are significantly integrated into natural systems. Where natural formations are concerned, there is a predominance of juniper woods, *Ilex azorica* (azevinho) forests and *Erica* heaths.

Other communities such as *Calluna vulgaris scrub* and recolonised scrub also display diversity; in all of these environments, one can find endemic plant species that provide habitat for *Columba palumbus azorica* (pombo-torcaz-dos-Açores), an endemic bird sub-species.

Areas containing endemic vegetation host invertebrate micro-fauna, which play an important ecological role and act as indicators of ongoing evolutionary processes on these islands. For instance, of the 86 endemic arthropod species found in São Jorge, 7 are endemic to this island.

Figure 78. Cedro-do-mato (*Juniperus brevifolia*) and urze (*Erica azorica*) woods

Figure 79. Pombo-torcaz-dos-Açores (*Columba palumbus azorica*)

This area is chiefly noted for the following typical species:

Table nº. 8 - Typical highland species on São Jorge Island

GROUP	SPECIES		
PLANTS	*Ammi trifoliatum*	*Juniperus brevifolia*	*Calluna vulgaris*
	Arceuthobium azoricum	*Platanthera sp.*	*Ranunculus cortusifolius*
	Chaerophyllum azoricum	*Rumex azoricus*	*Tolpis azorica*
	Culcita macrocarpa	*Sanicula azorica*	*Ilex azorica*
	Deschampsia foliosa	*Scabiosa nitens*	*Laurus azorica*
	Erica azorica	*Trichomanes speciosum*	*Vaccinium cylindraceum*
	Euphorbia stygiana	*Woodwardia radicans*	*Holcus rigidus*
	Euphrasia grandiflora	*Potamogeton polygonifolius*	*Daboecia azorica*
	Frangula azorica	*Juncus effusus*	
	Isoëtes azorica	*Sphagnum sp.*	
INVERTEBRATES	*Cixius azopifajo azojo*	*Acorigone zebraneus*	*Trechus jorgensis*
	Cheiracanthiumjorgeense	*Trechus isabelaei*	*Hipparchia azorina jorgense*
AMPHIBIANS	*Rana perezi*		
BIRDS	*Carduelis carduelis*	*Gallinago gallinago*	*Erithacus rubecula*
	Fringilla coelebs moreletti	*Turdus merula azorenis*	*Sturnus vulgaris*
	Columba palumbus azorica	*Regulus regulus inermis*	*Anas crecca*
	Motacilla cinerea patriciae	*Serinus canaria*	
	Scolopax rusticola	*Sylvia atricapila*	
MAMMALS	*Nyctalus azoreum*		

▶ **IMPORTANT NATURAL PROCESSES:**

This area contains 11 habitats listed in the annexes of the Habitats Directive, of which the following are classified as priority habitats:

- 4050 Endemic macaronesian heaths;
- 7110 Active raised bogs;
- 91 D0 Bog woodland;
- 9360 Macaronesian laurel forests;
- 9560 Endemic forests with *Juniperus* spp.

These habitats are found in São Jorge's Central Plateau, comprising a matrix in the landscape, dominated for the most part by Macaronesian and artificial pastures. There are, however, valuable natural heritage features in terms of the number of endemic and rare species and levels of biodiversity. They play a central role in the island's hydrological regime by collecting and retaining visible and occult precipitation and reducing erosion.

The proposed Biosphere Reserve is also important for migratory birds. Due to its location in the middle of the ocean, the island plays an important role as a resting and feeding area for several aquatic bird species.

▶ MAIN HUMAN IMPACTS:

The predominant human activities that negatively affect the environment are livestock production and forestry, albeit practiced extensively, road construction, repair and cleaning, aggregate extraction, water exploitation and tourism.

The primary threats include the grazing and trampling of vegetation of conservation interest, wetland degradation, potential landslides and erosion, the proliferation of exotic species and the dumping of waste.

▶ RELEVANT MANAGEMENT PRACTICES:

This area is managed by São Jorge Natural Park and is part of the Protected Area for the Management of Habitats and Species in Pico da Esperança and the Central Highland. The scope of this protected area includes the objectives established for the Costa Nordeste and Ponta do Topo SAC and is in line with the framework set out in the Sectorial Plan of the Natura 2000 Network.

It aims to provide the conditions necessary for protecting important species, groups of species, biotic communities and physical features in a site and promotes the recognition of natural values and the benefits of activities practised within the protected area so long as they are compatible with the site's management objectives.

As such, activities that have the greatest impact on the environment are prohibited, including collecting or capturing protected species, introducing exotic species or dumping waste. Other activities require prior authorisation, such as altering soil morphology through excavation or changes to vegetation cover; construction; mining; water extraction and diversion; construction of roads and communication lines; the installation of electrical, telecommunications, aerial and subterranean infrastructures; renewal energy exploitation; scientific research and dissemination; and actions involving environmental monitoring, restoration and awareness-raising.

Figure 80. Não-me-esqueças (*Myosotis maritima*)

Figure 81. Pé-de-pomba (*Ammi trifoliatum*)

COASTAL AREA AND ISLETS (REGIONAL)

▶ **TYPICAL SPECIES:**

Due to the island's geomorphological features, the existing coastal vegetation zone covers the entire coast, which is generally rugged or very steep. The coastline of São Jorge is characterised by high, imposing cliffs that rise abruptly from the sea, especially in the north, providing a contrast with the *fajãs* or coastal deltas that were formed from lava flows or landslides.

In terms of land use, these features limit human intervention to such an extent that the coastal area is dominated by forests, scrubs and coastal vegetation. However, the *fajãs* do contain significant stretches of farmland, a testament to the importance of agriculture as an economic activity on the island.

Viewing the island as a whole, we can see a clear difference between the northern and southern coasts. On the southern coast, whose inclines are gentler and not as stable, most of the natural forests and scrubs have been taken over by *Pittosporum undulatum* (incenso), an exotic species that tends to crowds out its native counterparts. On the northern coast, the much steeper inclines are dominated by stands of *Erica azorica* (urze), *Morella faya* (faia) and *Picconia azorica* (pau-branco), while *Pittosporum undulatum* (incenso) has invaded some areas. With respect to exotic species, there has been significant afforestation with *Cryptomeria japonica* (criptoméria).

Rare endemic species of flora such as *Juniperus brevifolia* (cedro-do-mato) also occur, as well as species classified under the Habitats Directive (e.g., *Myosotis maritima* (não-me-esqueças), *Azorina vidalii* (vidália), *Ammi trifoliatum* (pé-de-pomba) and *Rumex azoricus* (labaça-das-ilhas).

Figure 82. Tentilhão (*Fringilla coelbs moreletti*)

Figure 83. Garajau rosado (*Sterna dougallii*)

The lowlands close to the sea contain communities of *Spergularia azorica* (a species listed in Annexes II and IV of the Habitats Directive), *Festuca petraea* (bracel-da-costa) and *Daucus azorica* (salsa-burra). In highly rugged areas, one can find communities of *Asplenium marinum*, *Sagina maritima*, *Gaudinia coarctata* and *Polygonum maritimum* (often in a mosaic with formations of *Asplenium marinum* and a community of *Festuca petraea* and *Daucus azorica*).

Especially noteworthy for the richness of their biological resources are Fajã dos Cubres and Fajã da Caldeira de Santo Cristo, which contain a number of rare species. These *fajãs* are areas that have been designated for nature conservation and biodiversity, including the Network of Protected Areas of the Autonomous Region of the Azores (Protected Landscape of Fajãs do Norte), the Natura 2000 Network (Costa Nordeste and Ponta do Topo Special Area of Conservation) and a Wetland of International Importance (RAMSAR Site). In terms of flora, they host a great concentration of *Scabiosa nitens* and *Ammi trifoliatum* (pé-de-pomba), both of which are rare, endemic and listed in Annexes II and IV of the Habitats Directive. They also provide good conditions for observing anatidae and occasional wading birds.

As for strictly terrestrial vertebrates, diversity is somewhat low due to a number of factors that limit the presence of animals, especially mammals, terrestrial birds and riverine fish (the presence of *Anguilla sp.* has been confirmed in only three rivers). However, the *fajãs* do harbour the only mammal that is endemic to the Azores – *Nyctalus azoreum* (bat) – as well as *Columba palumbus azorica* (pombo-torcaz-dos-Açores). Other important species include *Turdus merula azorensis* (melro-preto), *Fringilla coelbs moreletti* (tentilhão), *Buteo buteo rothschildi* (milhafre) and *Serinus canaria* (canário).

Whilst freshwater birds are more likely to be seen near interior lagoons and watercourses, they can also be found on São Jorge's coastal area, especially in the north.

Various colonies of marine birds also nest along these coastal areas. The islet of Topo and the adjacent coast contain a great diversity of marine birds that are important in the context of the archipelago, including more than 60% of Europe's population of *Calonectris borealis* (cagarro), as well as *Sterna hirundo* (garajau comum), *Sterna dougallii* (garajau rosado) – a priority species – and

Hydrobates castro (painho). Ponta dos Rosais is also important as a site that provides nesting and sheltering areas for *Calonectris borealis* (including the second largest colony in the Azores), *Sterna hirundo, Sterna dougallii and Puffinus assimilis baroli* (frulho).

In terms of invertebrates, São Jorge contains a high diversity of insects and other arthropods.

This area is chiefly noted for the following typical species:

Table nº. 9 - Typical species in São Jorge's coastal areas and islets

GROUP	SPECIES		
PLANTS	*Ammi trifoliatum*	*Euphorbia azorica*	*Spergularia azorica*
	Azorina vidalii	*Daucus azorica*	*Scabiosa nitens*
	Festuca petraea	*Myosotis marítima*	*Rumex azoricus*
	Dracaena draco	*Morella faia*	*Asplenium marinum*
	Erica azorica	*Picconia azorica*	
REPTILES	*Lacerta dugesii*		
INVERTEBRATES	*Trechus jorgensis*	*Heteroderes azoricus*	*Lauria fasciolata*
	Otiorhynchus trophonius azoricus	*Heteroderes melliculus moreleti*	*Moreletina horripila*
	Drouetius azoricus azoricus	*Hipparchia azorina azorina*	*Moreletina vespertina*
	Cathormiocerus curvipes	*Leiostyla fuscidola*	*Plutonia atlântica*
	Hydroporus guernei	*Leiostyla rugulosa*	*Plutonia brumalis*
BIRDS	*Calonectris borealis*	*Puffinus assimilis baroli*	*Bulweria bulweria*
	Larus michahellis atlantis	*Sterna dougallii*	*Columba livia*
	Hydrobates castro	*Sterna hirundo*	*Egretta garzetta*

▶ IMPORTANT NATURAL PROCESSES:

São Jorge's Coastline is vulnerable to various natural and human-induced activities that pose potential hazards to local populations, ecosystems and built heritage.

The coast, especially in the north, is comprised of tall, rugged cliffs that make for an abrupt landscape. Emerging occasionally between the coasts and the sea are flat areas, known locally as *fajãs*. Formed by rocks shaped by the sea and by angular blocks created from landslides, these small, flat deposits or gently sloping ridges, which keep the sea at bay and appear at the base of the cliffs, are

detrital *fajãs*. Other slightly larger *fajãs* are mainly found on the southern coast. These are the lava *fajãs*, whose fossilised cliffs were formed by lava flowing into the sea in the wake of recent eruptions.

These *fajãs* are narrow stretches of land that are highly susceptible to natural hazards associated with seismic activity (landslides and liquefaction of sand and deposits), slope movement (landslides and falling blocks) and coastal erosion (erosion, overtopping).

Waves from the sea move the rocks along the island's coastline and deposit them at the base of the cliffs, giving rise to landslides of varying intensities. These are often associated with meteorological phenomena such as torrential rains or earthquakes. These narrow strips of land are often hit by storms (wave action and gale-force winds). The overhanging cliffs are subjected to constant landslides that pose a serious threat to safety.

The richest areas in terms of natural values can be found at Ponta dos Rosais, Costa Nordeste and Ponta do Topo (especially Fajã da Caldeira de Santo Cristo and Fajã dos Cubres), as well as the islet of Topo and the adjacent coast. These sites are highly representative in terms of priority habitats and vegetation listed in the Habitats Directive. Other priority habitats include endemic Macaronesian heaths; coastal lagoons; vegetated sea cliffs with endemic flora of the Macaronesian coasts; perennial vegetation of stony banks; annual vegetation of drift lines; and Mediterranean salt meadows.

The sea cliffs and islets, in turn, are an important component of a network of protected areas in the Azores, harbouring important nesting colonies of marine birds that have been listed as priority birds in Annex I of the Birds Directive, underlining their international importance.

▶ MAIN HUMAN IMPACTS:

Due to agricultural activity, especially cattle farming, and the introduction of exotic plant species that have become invasive, São Jorge's natural habitats have been significantly altered since the island was first settled by humans.

Currently, the main activities that pose a potential threat to coastal areas are the construction of houses and infrastructure, the introduction of exotic animal and plant species, waste generation and the use of hiking trails for recreation and tourism.

▶ RELEVANT MANAGEMENT PRACTICES:

The most important areas in terms of habitats and conservation of biodiversity are classified under law as protected areas with special status. As such, they serve as management instruments that promote such practises as conservation, research, education and information, resource management and law enforcement.

Protected areas contained in São Jorge Natural Park include: Ponta dos Rosais Natural Monument; the Protected Area for the Management of Habitats and Species of Costa Noroeste; the Protected Area for the Management of Habitats and Species of Costa Sudoeste; Protected Area for the Management of Habitats and Species of Costa das Velas, the Protected Area for the Management of Habitats and Species of Fajã das Almas; the Protected Area for the Management of Habitats and Species of Costa do Topo; the Protected Landscape Area of Fajãs do Norte; the Protected Area for the Management of the Resources of Costa Oeste; the Protected

Area for the Management of the Resources of Entre Morros; the Protected Area for the Management of the Resources of Costa das Fajãs; and the Protected Area for the Management of the Resources of Topo.

The scope of the Ponta dos Rosais Natural Monument and the Protected Area for the Management of the Resources of Costa Oeste includes the objectives and boundaries defined for the Ponta dos Rosais Special Area of Conservation (SAC) and is in line with the framework established in the Sectorial Plan for the Natura 2000 Network. The scope of the Protected Area for the Management of Habitats and Species of Costa do Topo includes the objectives and territorial limits defined for the Costa Nordeste and Ponta do Topo Special Area of Conservation and for a Special Protection Area, and is in line with the framework established in the Sectorial Plan for the Natura 2000 Network. The scope of the Protected Area for the Management of Habitats and Species of Ilhéu do Topo includes the objectives and territorial limits defined for a Special Area of Conservation and is in line with the framework established in the Sectorial Plan for the Natura 2000 Network. The scope of the Protected Landscape of Fajãs do Norte, the Protected Area for the Management of the Resources of Costa das Fajãs and the Protected Area for the Management of the Resources of Costa do Topo includes the objectives and boundaries defined for the Costa Nordeste e Ponto do Topo Special Area of Conservation and is in line with the framework established in the Sectorial Plan for the Natura 2000 Network.

With respect to preserving habitats, ecosystems and species in a favourable state and maintaining ecological processes, the collection, cutting, killing, capture, extraction and detention of specimens of protected species in any phase of their biological cycle is strictly prohibited. Other banned activities include disturbing or destroying protected species' habitats, with the exception of scientific activities that have been authorised under the defined terms; extraction of aggregates of any kind; altering the morphology of soil by excavating, adding or removing earth, altering vegetation cover or cutting down trees or bushes; dumping waste or wastewater of any kind, except for residential wastewater generated within the protected area; motorised sports likely to create pollution or noise or damage the area's natural features; the circulation of motorised vehicles beyond designated roads, except when absolutely necessary for activities involving agroforestry and safety; camping and trailer camping beyond designated sites, unless specifically authorised by the director of São Jorge Natural Park; and any other activities that disturb the ecological balance of the protected area.

Except when specifically regulated, hunting, fishing in lagoons, lakes and ponds, and spear fishing in the Fajã da Caldeira de Santo Cristo lagoon are prohibited in protected areas for the management of habitats and species.

Other activities such as altering the morphology of the soil, the construction of buildings, mining and actions that rehabilitate the landscape, geomorphology or ecology are subject to prior authorisation.

By definition, a marine habitat is an abiotic component in which an array of living species make up a community (biotic component). Together they form a marine biotope that interacts in conjunction with other biotopes, creating the ecosystems of a specific geographic region. The range of marine biotopes and ecosystems depends to a great extent on the kinds of abiotic conditions to which they are subjected.

The Azores contains a complex, diverse mosaic of coastal and oceanic marine habitats that are uniquely interlinked, reflecting the close proximity of environments both coastal and oceanic and pelagic and demersal. The different habitats on the archipelago serve as breeding, sheltering, nursing, feeding and roosting areas for numerous species with distinct ecological and geographical affinities.

Due to their oceanographic and biological features, various habitats on the archipelago have proven to be important from an economic standpoint. In some instances, the exploitation of its biological resources has increased over the years, as well as its usage for the purposes of tourism and recreation.

The habitats that have been identified in São Jorge's marine areas include "large shallow inlets and bays", "reefs", "submerged or partially submerged caves" and in Fajã dos Cubres and Fajã da Caldeira de Santo Cristo, "coastal lagoons".

In the marine areas of Ponta dos Rosais and Morros das Velas, species are essentially distributed among 12 different phyla of fauna and flora. The most representative groups in terms of numbers of species registered are the phylum Chordata, followed by algae from the phylum Rhodophycota.

As for algae, species from three phyla have been recorded: red algae, brown algae and green algae. The most representative species of the Ponta dos Rosais marine area, having registered the highest densities, are the Phaeophyceae *Dictyota dichotoma* and *Cuteleria multifidia* and the rhodophytes of the genuses *Corallina* and *Gelidium*, and *Pterocladia capillacea*.

Species that have been identified in the marine areas of Ponta dos Rosais and Morros das Velas are distributed among eight phyla of invertebrates. Echinodermata, Arthropoda and Porifera are the richest in terms of species diversity. The most abundant species in this marine area are hydroids of the genus *Aglaophenia*and the sponge *Clathrina coriacea*.

The phylum Chordata is represented by nearly 30 species of fish in the marine area of Ponta dos Rosais. The most abundant species recorded here are *Boops boops* (boga), *Centrolabrus caeroleus* (bodião-verde), *Coris julis* (peixe-rei) and *Thalassoma pavo* (raínha). Three pelagic species that are characteristic of exposed areas have been recorded, including *Pseudocaranx dentex* (encharéu), *Seriola rivoliana* (lírio) and *Sphyraena viridensis* (bicuda).

Leaving Morros de Velas and Ponta dos Rosais, we come to another marine area whose lagoons at Fajã dos Cubres and Fajã da Caldeira de Santo Cristo are the most studied from a scientific standpoint. These lagoons are very important for several species of birds (terrestrial, marine and wading) that use them for roosting and feeding or as habitat for one phase of their life cycle.

In terms of flora, three species have been recorded in this marine area; each belong to a distinct phylum: the chlorophyte *Cladophora sp.*, the phaeophyte *Halopteris sp.* and the rhodophyte *Pterocladia capillacea*. Given that this zone contains lagoon areas

Figure 84. Lagarta-do-fogo (*Herrmodice caranculata*)

Figure 85. Rainha (*Thalassoma pavo*)

(at Fajã dos Cubres and Fajã da Caldeira do Santo Cristo), noteworthy species include *Rupia marítima* and the aquatic plant *Juncus acutus* (junco), which are rarely found in the Azores.

As for species found from the coastal zone of this area to the marine area of Topo, we find algal cover typical of exposed areas, with a predominance of encrusting and/or erect algae of the Corallinaceae family at a few metres of depth. At greater depths, typical species include the phaeophyceae *Padina pavonica*, *Stypocaulon scoparium*, *Zonaria tournefortii* and species belonging to the genus *Dictyota*. A number of rhodophytes, including *Peyssonelia rubra*, are also commonly found in these habitats and at greater depths.

In the marine areas extending from Zona Central to Zona do Topo, species are distributed among seven phyla of invertebrates. The phylum Mollusca, with 13 species represented, and the phylum Porifera, with 10 species, are the richest in terms of species diversity. Some of the species that have been recorded live only in lagoon areas, such as *Ruditapes decussatus* (amêijoa-boa) and *Palaemon serratus* (camarão), which are associated with *Rupia maritima*. Other recorded species, which predominantly occur on the northeast coast of Topo islet and Ponta do Topo, include *Holothuria forskali* and *Holothuria tubulosa* (holotúrias), *Palaemon serratus* (camarão), *Tellina sp.* (bivalve), *Sabella spallanzanii* (espirógrafo), *Hermodice caranculata* (lagarta-do-fogo) and various species of sponges (Haliclona sp., species belonging to complexes comprised of the genera *Tedania*/*Myxilla* and *Ircinia*/*Sarcotragus*). Being an exposed area, it is likely to contain large populations of *Corynactis viridis* (anémona-jóia) and extensive numbers of serpulidae of the class polychaeta.

The phylum Chordata is represented by nearly 23 species of fish on the northeast coast and at Ponta do Topo, of which *Anguilla anguilla* (enguia-europeia) has been found only in lagoon systems. Other species that are commonly found in coastal areas have also been recorded here. Species most associated with the substrate include *Abudefduf luridus* (castanheta-azul), *Coris julis* (peixe-rei),

Sparisoma cretense (veja) and various species of gudgeon (*Parablennius ruber*, *P. sanguinolentus parvicornis*, *Pomatochistus pictus* and *Tripterygion delaisi delaisi*). Typical species found in the water column include *Boops boops* (bogas), *Diplodus sargus* (sargos) and *Trachinotus ovatus* (prombeta), among others.

The lagoon at Fajã da Caldeira de Santo Cristo is considered a very important nursing area for many fish species. Schools of young *Epinephelus marginatus* (mero), *Mycteroperca fusca* (badejo) and *Chelon labrosus* (tainhas), among others, are commonly found in high densities.

This area is chiefly noted for the following typical species:

Table nº. 10 - Typical species in the marine areas of São Jorge Island

GROUP	SPECIES		
PLANTS/ALGAE	*Cladophora sp.*	*Gelidium sp.*	*Peyssonelia rubra*
	Corallina sp.	*Halopteris sp*	*Porphyra sp.* (Erva patinha)
	Cutleria multifidia	*Juncus acutus* (Junco)	*Pterocladia capilácea*
	Dictyota dichotoma	*Padina pavonica*	
INVERTEBRATES	*Aglaophenia* sp. (Hidrozoário)	*Maja brachydactila* (Santola)	*Patella candei* (Lapa-mansa)
	Clathrina coriácea (Esponja)	*Megabalanus azoricus* (Craca)	*Ruditapes decussatus* (Amêijoa-boa)
	Corynactis viridis (Anémona-jóia)	*Octopus vulgaris* (Polvo-comum)	*Sabella spallanzanii* (Espirógrafo)
	Hermodice caranculata (Lagarta-do-fogo)	*Palaemon serratus* (Camarão)	*Scylarides latus* (Cavaco)
	Holothuria forskali (Holotúria)	*Palinurus elephas* (Lagosta)	
	Holothuria tubulosa (Holotúria)	*Patella aspera* (Lapa-brava)	
FISH	*Abudefduf luridus* (Castanheta-azul)	*Boops boops* (Boga)	*Chelon labrosus* (Tainha)
	Anguilla anguilla (Enguia-europeia)	*Centrolabrus caeroleus* (Bodião-verde)	*Coris julis* (Peixe-rei)
REPTILES	*Caretta caretta* (Tartaruga-careta)		
CETACEANS	*Delphinus delphis* (Golfinho-comum)	*Grampus griseus* (Moleiro ou grampo)	*Tursiops truncatus* (Roaz)

▶ MAIN HUMAN IMPACTS:

Like other islands in the Azores, the marine areas of São Jorge suffer from human influence, largely as a result of the exploitation of living resources, be it commercial or recreational fishing (coastal extraction and hook and line) or the hunting of pelagic species by experienced divers. Although reduced at present, the impacts of tourist activities such as boating, whale watching and scuba diving are becoming increasingly significant.

Nutrient concentration at the surface increases as one approaches the islands' coasts due to runoff from nutrients entering from land. Biological changes resulting from eutrophication are therefore felt with greater intensity in coastal areas and particularly near larger urban centres and more sheltered zones, such as coastal lagoons, semi-enclosed bays, ports and marinas. The most common sources for nutrient runoff into the marine environment are domestic effluents, agricultural runoff from intensive livestock production and industrial effluents from food processing plants. However, the elevated exposure of the islands to intense hydrodynamic activity as a consequence of the archipelago's oceanic position, the great distances between islands and the oligotrophic nature of its bodies of water has proven advantageous for the dispersion of nutrients that have been directly or indirectly introduced by human activity.

▶ RELEVANT MANAGEMENT PRACTICES:

The Azores archipelago and its surrounding oceanic region are an internationally significant repository for biodiversity that needs to be adequately protected to offset the natural vulnerabilities resulting from the limited range of insular ecosystems, the isolation of the islands and in relation to continental regions, habitat fragmentation and loss, and the vulnerability of endemic species to invasive species.

Environment and spatial planning are the responsibility of the Autonomous Region of the Azores, which includes protection of the environment, promotion of ecological balance, nature protection and natural resources management. As such, the regional government has powers to oversee and monitor protected and classified areas, including habitats, biodiversity, fauna and flora, environmental quality control, land use planning and land use planning instruments, as well as other specific matters.

In terms of the protection of biodiversity, the first regional initiative was the Regional Legislative Decree no. 2/83/A of 2 March, which established regulations to preserve ecological balance, namely banning the capture of dolphins that swim in the waters around the Azores. This decree, which was the first to protect cetacean in waters within Portuguese jurisdiction, initiated a series of legislative interventions in the area of nature conservation.

The nature conservation measures dispersed by various regional laws, as well as other measures contained in related legislation, are now enshrined in Regional Legislative Decree no. 15/2012/A of 2 April in the context of modern provisions for protecting biodiversity. These include, in particular, provisions arising from specific European directives – namely the Birds Directive and the Habitats Directive – and the application of various international conventions on biodiversity that Portugal has signed. These include the Bern Convention, the Bonn Convention, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the RAMSAR Convention and the International Whaling Commission. Taking into account the objectives of stopping

and reversing biodiversity loss in Europe, as outlined for the International Year of Biodiversity celebrated in 2010, the decree also develops the provision in Articles 15, 16 and 29 of Law no. 11/87 of 7 April, which was amended by Law no. 13/2002 of 19 February, the Basic Law on the Environment.

Regional Legislative Decree no. 15/2012/A of 2 April establishes a legal framework for nature and biodiversity conversation, supporting the maintenance of biodiversity through the conservation or restoration of natural habitats and wild flora and fauna within a favourable conservation status, the management and control of wild species and the regulation of their exploitation. The decree also aims to regulate the captive breeding and reintroduction of flora and fauna species that no longer occur in their natural state in the region, as well as establish appropriate measures to control and eradicate invasive species or species that pose a known ecological risk. It transposes the Birds Directive and Habitats Directive into regional law and establishes the measures necessary for fulfilling and applying the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Council Regulation no. 338/97 on the protection of species of wild fauna and flora by regulating trade therein and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds, among others, on regional territory.

Beyond these decrees are numerous measures for managing fisheries resources, including the implementation of Reserve Areas for the Management of Catches, as set out in Ordinance no. 1/2014 of 10 January.

Finally, the coastal and marine core areas coincide with the protected areas within São Jorge Natural Park, whose legal status is established by Regional Legislative Decree 10/2011/A of 28 March. This status includes the categories of Natural Monument, Protected Landscape Area and Protected Area for the Management of Resources, which were established according to IUCN (International Union for Conservation of Nature) criteria. Under the category of Protected Areas for the Management of Resources, São Jorge Natural Park thus includes the Protected Areas of Costa Oeste, Costa das Fajãs, Entre Morros and Costa Nordeste. The management objectives of these areas include preserving biodiversity and other natural values over the long term; promoting effective management through sustainable resource use, particularly the fisheries and other activities that have low impacts on the environment; and supporting regional sustainable development.

12. ECOSYSTEM SERVICES

12.1. IF POSSIBLE, IDENTIFY THE ECOSYSTEM SERVICES PROVIDED BY EACH ECOSYSTEM OF THE BIOSPHERE RESERVE AND THE BENEFICIARIES OF THESE SERVICES

No detailed studies of the ecosystem services provided by the natural systems on São Jorge have ever been carried out. However, we can identify the following environmental services provided by the various ecosystems contained in the proposed biosphere reserve:

- **Marine and terrestrial natural ecosystems:** food, climate regulation, nutrient cycling, research, recreation and tourism.
- **Agrarian ecosystems:** food, cultural heritage, humanised landscape, nutrient cycling and water.
- **Urban and humanised ecosystems:** regulation of air and water quality, recreation and tourism, cultural and religious heritage.

The main beneficiaries of these services are the population of São Jorge, the scientific community and the visitors and tourists that come to the island.

12.2. SPECIFY WHETHER INDICATORS OF ECOSYSTEM SERVICES ARE USED TO EVALUATE THE THREE FUNCTIONS (CONSERVATION, DEVELOPMENT AND LOGISTIC) OF THE BIOSPHERE RESERVE

The indicators for ecosystem services that will be used for evaluating conservation, development and logistical support will be developed and established within the scope of a management and communications support system for the Fajãs de São Jorge Biosphere Reserve.

12.3. DESCRIBE BIODIVERSITY INVOLVED IN THE PROVISION OF ECOSYSTEMS SERVICES IN THE BIOSPHERE RESERVE

Table nº. 11 - Species of flora involved in providing ecosystem services

FLORA			ENVIRONMENTAL SERVICES
GROUP	ECOSYSTEM	SPECIES	
Vascular plants	Altitude	*Vaccinium cylindraceum*	Food
Bryophyte	Altitude	*Sphagnum spp.*	Climate regulation
Non-vascular plants	Coastal and marine	*Porphyra sp.*	Food
Spermatophyte	Coastal	*Azorina vidalii*	Research
Spermatophyte	Altitude	*Chaerophyllum azoricum*	Research
Spermatophyte	Altitude	*Juniperus brevifolia*	Research
Spermatophyte	Altitude	*Rumex azoricus*	Research
Spermatophyte	Altitude	*Leontodon filii*	Research

Table nº. 12 - Species of fauna involved in providing ecosystem services

FAUNA			ENVIRONMENTAL SERVICES
GROUP	ECOSYSTEM	SPECIES	
Mollusc	Marine	*Patella spp*	Food
Cetacean	Marine	*Tursiops truncatus*	Leisure and tourism
Cetacean	Marine	*Delphinus delphis*	Leisure and tourism
Bivalve	Marine	*Ruditapes decussatus*	Food
Mollusc	Marine	*Octopus vulgaris*	Food
Crustacean	Marine	*Megabalanus azoricus*	Food
Crustacean	Marine	*Palinurus elephas*	Food
Crustacean	Marine	*Maja capensis*	Food
Crustacean	Marine	*Scylarides latus*	Food
Fish	Marine	*Epinephelus marginatus*	Food / Leisure and tourism
Fish	Marine	*Mullus surmuletus*	Food
Fish	Marine	*Phycis phycis*	Food
Wading bird	Coastal aquatic	*Arenaria interpres*	Leisure and tourism
Wading bird	Coastal aquatic	*Calidris alba*	Leisure and tourism
Wading bird	Coastal aquatic	*Charadrius alexandrinus*	Leisure and tourism
Wading bird	Aquatic	*Tringa nebularia*	Leisure and tourism
Wading bird	Aquatic	*Numenius phaeopus*	Leisure and tourism
Egret	Wetland	*Egretta garzetta*	Leisure and tourism
Egret	Wetland	*Ardea cinerea*	Leisure and tourism
Duck	Wetland	*Fulica atra*	Leisure and tourism
Duck	Wetland	*Aythya fuligula*	Leisure and tourism
Shearwater	Marine	*Puffinus baroli*	Leisure and tourism

12.4. SPECIFY WHETHER ANY ECOSYSTEM SERVICES ASSESSMENT HAS BEEN DONE FOR THE PROPOSED BIOSPHERE RESERVE

No study has ever been done to specifically evaluate ecosystem services on São Jorge. However, oceanic islands contain unique ecosystems that are generally rich in biodiversity, which have an impact on ecological processes and ecosystem services. Biodiversity is the cornerstone for the existence of fertile soils, sustainable agriculture, balanced production forests, and food availability.

In most cases, vegetation is one of the most important elements. Its significance is apparent when one considers the roles it plays in capturing the sun's energy – being the primary producer for nearly all ecosystems – and its highly important relationships with other biotic and abiotic components: vegetation can stabilise slopes, slow down erosion, maintain local microclimates and provide habitat for animal species, etc. Since each plant community is the product of a combination of specific environmental conditions, plant communities are representative of the ecosystems to which they belong; as such, one can define the different ecosystems of an area by identifying the plant communities that occur there.

Native forests play a key role on the islands. These areas are crucial for water regulation (they play a major role in fog interception and aquifer recharge) and soil maintenance and stabilisation (preventing erosion). They are also a unique reservoir for biodiversity and have an indirect economic value in terms of their highly aesthetic value and recreational potential.

Wetland ecosystems (watercourses and cascades) are a potential source of potable water for local populations. They also have strong scenic value and can promote adventure tourism (e.g. canyoning and cascading).

As one particular type of wetland, peat bogs play important roles, serving as structural elements in the landscape and acting as buffering/retaining systems for the natural water cycle. In functioning as regulators of the water cycle at the island's highest altitudes, they regulate downstream water courses as a result. They also retain and sequester greenhouse gases (methane and carbon), promote zonal and azonal biodiversity as natural ecosystems, and encourage soil stability in the island's highest zones by reducing the potential for landslides and mudslides.

The multifunctional roles played by peat bogs in terms of the services they provide for nature and humans (biodiversity, carbon sink, water retention and nutrient cycling) has implications for societal development (eventually, peat bogs will be considered in the carbon market).

In the island's coastal zones, existing areas that are in a highly natural state and have high ecological value favour the development of various activities associated with nature and rural tourism, particularly in the *fajãs*. This would allow for a diversification of economic activities by promoting recreational activities, including hiking, BTT, canyoning, cascading and wildlife observation (birdwatching).

Figure 86. São Tomé waterfall, Topo

Lagoon ecosystems play an important role in coastal protection and in the provision of nesting areas and flight paths for migratory birds, thereby promoting birdwatching and photography. The presence of *Ruditapes decussatus* (amêijoa) in the Fajã da Caldeira de Santo Cristo lagoon represents an important economic resource.

Marine waters facilitate the observation of marine species and undersea caves and are important for bathing and recreational fishing. The wave action in the area is particularly favourable for surfing.

Soon after Azores was discovered and populated in the 15th century, profound changes to the original vegetation began to take place. Human interaction with nature created new balances and ecosystems, especially in terms of food production (pasturing to feed cows and farmland for fruit and vegetable production).

Extensive management of agro-ecosystems is the ideal solution on the islands, as shown in the widespread exploitation of semi-natural pastures.This has benefited a diversity of indigenous arthropods and vascular plants that have managed to subsist there and play an important ecological role as a result. On São Jorge, extensive livestock production on these high quality pastures provides another added value in terms of the milk that is produced for cheese production, accounting for its high quality and organoleptic properties.

Due to the presence of fertile soils, water and favourable climatic conditions (microclimates), agriculture has always been a primary activity in the *fajãs*, leading to the formation of humanised habits. Here, agricultural production includes vegetables (kale, lupin, potatoes, sweet potatoes, onions, garlic) and fruits (grapes, figs, apples, loquat, bananas, walnuts and plums, among others), corn and yam.

The rich biological and geological specificity of the ecosystems on the island provide potential opportunities for scientific research, including volcanology, seismology and understanding and exploiting the therapeutic and medicinal properties of specific species.

13. MAIN OBJECTIVES FOR THE BIOSPHERE RESERVE'S DESIGNATION

13.1. DESCRIBE THE MAIN OBJECTIVES OF THE PROPOSED BIOSPHERE RESERVE, INTEGRATING THE THREE FUNCTIONS (CONSERVATION, DEVELOPMENT AND LOGISTIC)

The main objectives of the proposed Biosphere Reserve include the conservation and sustainable use of genetic biodiversity and the biodiversity of species, habitats, ecosystems and landscapes, making them central to São Jorge's model for sustainable development. Aside from contributing towards high environmental standards, these objectives also serve as tools for creating opportunities for economic activity, creating sustainable, decently paid jobs that benefit the local economy.

As such, the aim will be to explore the proposed biosphere reserve's potential in attracting and retaining scientific research teams working in the environmental, cultural and social fields, and in developing environmental education and information programmes. We also aim to encourage sustainable tourism initiatives based on solid research on each area's specific carrying capacity and aptitude, monitored by reliable systems of indicators that are adapted to the local context.

13.2. DESCRIBE THE SUSTAINABLE DEVELOPMENT OBJECTIVES OF THE BIOSPHERE RESERVE

Firstly, the main objective of the Fajãs de São Jorge Biosphere Reserve is to improve the quality of life of local communities on the island and to promote integration between policies and actions at the local, municipal, regional, national and international levels, both in terms of nature conservation and economic development.

Another priority is the conservation and sustainable use of biological diversity, with a specific focus on developing economic activities such as tourism, fisheries and agriculture in line with conservation and environmental sustainability.

By promoting environmental education and information, the proposed biosphere reserve aims to support the ongoing involvement and participation of local communities in decision-making processes regarding sustainable development and, in particular, the protection of a good environmental status.

These priority objectives for sustainable development will be implemented through a process of compromise and close collaboration between stakeholders.

13.3. INDICATE THE MAIN STAKEHOLDERS INVOLVED IN THE MANAGEMENT OF THE BIOSPHERE RESERVE

The main stakeholders involved in the management of the Fajãs de São Jorge Biosphere Reserve are:

- The Azores government, through the departments responsible for environmental quality, nature conservation, spatial planning, water and forest resources, oceanic issues, including fisheries, scientific research and tourism;
- Local authorities, namely municipalities (the Calheta and Velas town councils) and the 11 parishes on the island;
- Civic and commercial associations, including the business association, the dairy union and cooperatives, agricultural associations, fisheries associations and cultural and environmental associations.

13.4. WHAT CONSULTATION PROCEDURE WAS USED FOR DESIGNING THE BIOSPHERE RESERVE?

The development and design of the Fajãs de São Jorge Biosphere Reserve proposal is the fruit of a long and extensive participatory process involving numerous contributions from public, private and associated organisations at the local, regional, national and international level.

The proposal is an initiative of the Azores government and involves a number of local actors, including the municipalities of São Jorge, local associations and institutions, organisations linked to scientific research and economic, environmental and cultural activity, and individuals.

A meeting was also held on São Jorge in September 2014 for REDBIOS – the East Atlantic Biosphere Reserve Network – which includes biosphere reserves in the Azores, Madeira, Canary Islands, Morocco, Mauritania, Senegal, Cape Verde and São Tomé and Principe.

The proposed Biosphere Reserve includes various stakeholders from the public, private and associative sectors. Having actively participated in the application process, these stakeholders are involved in its development.

When the application process for the Fajãs de São Jorge Biosphere Reserve was launched, an informal monitoring group was established, involving the participation of local authorities (municipalities), agricultural and fisheries organisations, private environmental and nature conservation associations, and individuals of recognised standing.

This group met several times over the course of the process and made a valuable contribution in preparing the application, including the proposed biosphere reserve's Action Plan.

The application also benefited from the collaboration and experience of three existing biosphere reserves in the Azores (Corvo, Graciosa and Flores), and if approved, the Biosphere Reserve will help strengthen the brand Biosfera Açores [Biosphere Azores].

Discussions on potential models for developing and zoning the proposed biosphere reserve took place, with various public events (conferences, workshops) held, including international seminars with managers from other Portuguese and international reserves.

Worth noting as well was the presentation of the proposal at the Fifth Conference of the World Network of Island and Coastal Biosphere Reserves in Malta in March 2015, where it received unanimous support in the meeting's final declaration.

A team was also created to work on the application form, which involved a huge number of collaborators. This form was presented in public sessions and underwent a lengthy period of public consultation in which contributions from the general population were collected.

13.5. HOW WILL STAKEHOLDER INVOLVEMENT IN IMPLEMENTING AND MANAGING THE BIOSPHERE RESERVE BE FOSTERED?

The Biosphere Reserves of the Azores Autonomous Region are within the legal jurisdiction of the Regional Network of Protected Areas under the terms defined in Articles 51 to 54 of Regional Legislative Decree no. 15/2012/A of 2 April.

As such, the stakeholders play a key role in the implementation and management of the proposed biosphere reserve in its various sectors. Their task is to encourage sustainable economic development and to participate in a management committee that meets at least once a semester, as set out in Article 54 of the some legislation.

The management committee will be headed by the director of the São Jorge Natural Park, who will be responsible for: overseeing the management plan and its implementation; overseeing management; promoting and authorising the use of the brand and the logos used on products and services; and recommending actions and projects to develop and promote the objectives of the biosphere reserve.

The rules for using the brand and logo "Biosfera Açores" on products and services are contained in Ordinance no. 27 of 28 April 2011. The brand and logo were established to promote and raise awareness of local resources with a view towards sustainable development.

Figure 87. Logo for the brand "Biosfera Açores"

13.6. WHAT ARE THE EXPECTED MAIN SOURCES OF RESOURCES (FINANCIAL, MATERIAL AND HUMAN) TO IMPLEMENT THE OBJECTIVES OF THE BIOSPHERE RESERVE AND PROJECTS WITHIN IT?

The main sources of funding for the activities of the future Fajãs de São Jorge Biosphere Reserve will come from various departments of the Azores government, the municipalities of Velas and Calheta on São Jorge, and private initiative.

A portion of the investment may come from EU Community co-funding within the scope of existing programmes at the regional (ERDF, EAGGF, EMFF), national (POSEUR) and transnational (PCT-MAC) levels.

In addition, the Azores government will be responsible for providing the logistical and administrative support needed for the biosphere reserve's operation under the terms of Article 53 of Regional Legislative Decree no. 15/2012/A of 2 April.

14. CONSERVATION FUNCTION

The Azores Archipelago contains a great diversity of fungi, plants and animals, totalling 8074 known *taxa* (species and subspecies).

The terrestrial environment of the Azores is home to 6489 *taxa*, including 325 non-nesting and potentially nesting bird species in the area. Of the *taxa* known to exist on land in the Azores, 452 are endemic to the archipelago.

The highest number of endemic *taxa* are found among animal species, which comprise 73% of the Azores' terrestrial endemism. The highest number of *taxa* are found among molluscs (snails and slugs), of which there are 49, and arthropods, of which there are 266.

Only one species of fish is endemic to the Azores: *Centrolabrus caeruleus* (bodião).

As far as birds are concerned, there are 13 recorded endemic bird species.

To complete the richness of endemic taxa, the occurrence of two bat species is to be highlighted: *Nyctalus azoreum* (morcego-dos-Açores), the only mammal that is endemic to the Azores, as well as *Pipistrellus maderensis* (morcego-da-Madeira), endemic to Macaronesia, both of which are included in Annex IV of the Habitats Directive as species in need of strict protection.

Regarding vascular plants, there are 73 endemic taxa in the Azores. Vidália (*Azorina vidalii*) is the only genus that is endemic to the Azores.

Figure 88. Bodião (*Centrolabrus caeruleus*)

Figure 89. Morcego-dos-Açores (*Nyctalus azoreum*)

Figure 90. Vidália (*Azorina vidalii*)

14.1. AT THE LEVEL OF LANDSCAPES AND ECOSYSTEMS (INCLUDING SOILS, WATER AND CLIMATE)

14.1.1. DESCRIBE AND GIVE THE LOCATION OF ECOSYSTEMS AND/OR LAND COVER TYPES OF THE BIOSPHERE RESERVE

14.1.2. DESCRIBE THE STATE AND TRENDS OF THE ECOSYSTEMS AND/OR LAND COVER TYPES DESCRIBED ABOVE AND THE NATURAL AND HUMAN DRIVERS OF THE TRENDS

The island of São Jorge contains a rich biological diversity, as well as a rich diversity of landscapes and cultures that needs to be preserved and valued.

At the rural level, land cultivation and animal husbandry have resulted in the development of a unique humanised landscape of significant cultural importance, one that has maintained preserved areas that serve as a refuge for unique biological values and ecosystems.

The island's high zones (central highland) feature a wet climate that favours a great variety of ecosystems, including endemic Macaronesian heaths, active high altitude peat bogs, degraded peat bogs that may be amenable to natural regeneration, afforested peat bogs and forests of *laurissilva*. These areas contain an extremely high concentration of rare species.

The diversity of wetlands found there represents a valuable natural heritage. These communities also provide important habitat for various migratory birds from freshwater environments.

This area also includes special pockets of natural habitat that are high in ecological importance, particularly stands of *Juniperus brevifolia* (cedro-do-mato), forests containing *Ilex azorica* (azevinho) and *Erica heaths*, *Calluna vulgaris* (rapa) and regenerated scrubs. Endemic plant species and populations of *Columba palumbus azorica* (pombo-torcaz-dos-Açores), an endemic subspecies of bird, can be found in all of these habitats.

Areas with endemic vegetation contain a microfauna of invertebrates that are important not only in terms of their respective ecological roles, but also as indicators of active evolutionary processes on these islands.

The predominantly rocky coastal zone is irregularly shaped and contains extensive stretches of high, rugged cliffs, mainly in the north, which make the landscape more abrupt. Emerging occasionally between the coasts and the sea are flat surfaces known locally as *fajãs*.

On São Jorge Island, 185 endemic terrestrial *taxa* (3 fungi, 60 plant, and 122 animal *taxa*) have been recorded, which amounts to 41% of the total endemic *taxa* on the Azores. Arthropods are the most representative group, with 86 *taxa*, including some endemic species to São Jorge, namely *Cixius azopifajo azojo* (cigarrinha-das-árvores), *Acorigone zebraneus* (aranha), *Cheiracanthium jorgense* (aranha caçadora de São Jorge), and *Pseudoblothrus oromii (*Pseudoscorpião cavernícola), *Hadena azorica* (traça), *Trechus isabelae* (carocho cavernícola), and *Trechus jorgensis* (carocho cavernícola), which represent a relevant and valuable natural heritage.

Figure 91. Cigarrinha-das-árvores (*Cixius azopifajo azojo*)

Figure 92. Orchid (*Platanthera Azorica*)

There are 10 recorded endemic Azorean bird species on São Jorge Island. The species *Nyctalus azoreum* (morcego-dos-Açores) and *Centrolabrus caeruleus* (bodião) are also present in the proposed Biosphere Reserve area.

Regarding vascular plants, approximately 75% of taxa endemic to the Azores have been recorded on São Jorge Island, including the vidália (*Azorina vidalii*).

Recently, a rare orchid species, *Platanthera azorica*, has been rediscovered. Its population is confined to Pico da Esperança on the central mountain range of São Jorge Island. Thus three endemic Azorean orchid species have been described – *Platanthera azorica*, *Platanthera micrantha*, and *Platanthera pollostantha* – all of which occur on São Jorge Island and are covered by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

São Jorge Island's central mountain range also hosts an important reserve of the species *Chaerophyllum azoricum*.

The presence of bogs is another relevant feature of São Jorge Island. The habitats listed in Annex 1 of the Habitats Directive, namely *Active raised bogs* (7110 - priority habitat), *Degraded raised bogs still capable of natural regeneration* (7120), and *Blanket bogs* (7130) are located on Serra do Topo and play an important functional role in collecting water and releasing it to aquifers. Therefore they are essential to the island's hydrological cycle.

Regarding the island's coastal area, its vegetation displays great floristic and phytocenotic originality. On the northern slope, communities of *Erica azorica* (urze), *Morella faya* (faia) and *Picconia azorica* (pau-branco) predominate while the southern slope is characterized by the presence of the exotic species *Pittosporum undulatum* (incenso). Other interesting floristic elements, such as *Dracaena draco* (dragoeiro), are also found, greatly enriching the island's natural landscape. In terms of forest areas, it important to mention the presence of *Cryptomeria japonica* (criptoméria or Japanese cedar).

These serve as an important reserve for scrubs containing *Erica azorica* (urze), *Morella faya* (faia) and *Picconia azorica* (pau-branco), as well as other endemic plant species such as *Azorina vidalii* (vidália), *Euphorbia azorica* (erva-leiteira), *Spergularia azorica*, *Myosotis maritima* (não-me-esqueças), *Ammi trifoliatum* (pé-de-pomba), *Rumex azoricus* (labaça-das-ilhas) and *Daucus azorica* (salsa-burra).

Figure 93. Dragoeiro (*Dracaena draco*)

Figure 94. Milhafre (*Buteo buteo rothschildi*)

The area includes Fajã dos Cubres and Fajã da Caldeira do Santo Cristo, which are known for the richness of their biological resources. They are unique communities in terms of the habitats they contain. Rare species are found here, including endemic species of flora mentioned in Annexes II and IV of the Habitats Directive: *Scabiosa nitens* and *Ammi trifoliatum* (pé-de-pomba). They provide exceptional feeding, roosting and nesting conditions for a large variety of migratory birds from freshwater environments and thus provide good birdwatching potential for occasional anatidae and wading birds.

The site of the Fajãs of Caldeira de Santo Cristo Lagoon and Cubres Lagoon, which is classified under the RAMSAR Convention, is of great ecological importance as it contains habitats listed in Annex I of the Habitats Directive, including *coastal lagoons* (1150, priority habitat), *large shallow inlets and bays*, *Mediterranean salt meadows,* and *endemic Macaronesian heaths* (4050, priority habitat), which provide unique and crucial conditions for supporting endemic and migrating species. The existing lagoon systems are unique or rare examples within the Azores and the Macaronesian biogeographic region.

The conservation of this site is of great interest due to its high level of biodiversity and the presence of natural habitats which provide the conditions needed for the nesting and passage of migratory birds such as: *Anas platyrhynchos* (pato-real), *Calidris alba* (pilrito-das-praias), *Limosa limosa* (maçarico-de-bico-direito), *Egretta garzetta* (garça-branca), and *Numenius phaeopus* (maçarico-galego); resident aquatic birds (e.g. *Anas crecca* – pato-marreco, *Gallinula chloropus* – galinha-d'água, *Arenaria interpres* – rola-do-mar); and terrestrial birds (e.g., *Buteo buteo rothschildi* – milhafre, and *Columba palumbus azorica* – pombo-torcaz-dos-Açores).

The local flora includes a considerable number of protected species or species of high biogeographic value such as *Erica azorica* (urze), *Juniperus brevifolia* (cedro-do-mato), *Festuca petraea* (bracel-da-rocha), *Ruppia marítima*, *Juncus acutus* (junco-agudo), *Polypogon maritimus* (Rabo-de-zorra-macio-menor), *Juncus maritimus* (junco-das-esteiras), *Solidago azorica* (cubres), *Morella faya* (faia), Myrsine retusa (tamujo), *Corema azorica* (camarinha), *Silene uniflora* (bermim), *Crithmum maritimum* (perrexil-do-mar), and *Carex hochstetteriana*.

In the marine and coastal areas several species occur that are important from a conservation point of view, including communities of culturally and economically important species such as *Patella aspera* and *Patella candei* (lapas), *Epinephelus marginatus* (meros),

Figure 95. Bermim (*Silene uniflora*)

Figure 96. Cachalote (*Physeter macrocephalus*)

and *Mycteroperca fusca* (badejos). Another relevant species is the red algae *Porphyra* sp., commonly known as "erva-patinha", one species of fish endemic to the Azores, *Centrolabrus caeruleus* (bodião), and several species of cetaceans, a group which is included in its entirety in Annex IV of the Habitats Directive.

Also worthy of note is the presence of the species *Themiste sp.* (sipúncula), which has not been described in any other area in the Azores.

A short distance from the coast are islets that provide important nesting habitat for seabirds, many of whom are listed in Annex I of the Birds Directive, and roosting areas and flight paths for migratory birds. Notable among them are the islets of Topo and Rosais, which are the most valuable in terms of the conservation of seabirds, such as *Calonectris borealis* (cagarro), *Sterna hirundo* (garajau comum), *Sterna dougallii* (garajau rosado), *Hydrobates castro* (painho) *and Pufinus assimilis baroli* (frulho).

Throughout the coastline and islets, the shape of the lava flows provides natural shelters (arches and semi-submerged caves, tidal pools) that offer favourable conditions for the growth of juvenile and adult coastal fish.

The island's most important natural heritage is contained in São Jorge Natural Park, which covers 13 protected areas: One Natural Monument, seven Protected Areas for the Management of Habitat/Species, one Protected Landscape Area, and four Protected Areas for the Management of Resources.

The Ponta dos Rosais Natural Monument (SJO01) consists of a terrestrial area that occupies approximately 170 ha, including the western tip of the island and the small islets that surround it. Here, one can observe a number of endemic plant species such as *Erica azorica* (urze) and *Myosotis maritima* (não-me-esqueças). This zone, which harbours important species of nesting seabirds such as *Sterna hirundo* (garajau-comum), *Sterna dougallii* (garajau-rosado) and *Calonectris borealis* (cagarro), is considered an Important Bird and Biodiversity Area (IBA).

The Protected Area for the Management of Habitats or Species of the North-West Coast (SJO02) occupies an area of around 701 ha, starting from the end of the protected area of the Ponta dos Rosais Natural Monument and extending along the north coast

Figure 97. Golfinho-comum (*Delphinus delphis*)

Figure 98. Cagarro nest (*Calonectris borealis*)

to Ribeira da Fonte, to east of Fajã da Ponta Furada. Several examples of endemic Azores vegetation exist here, including *Picconia azorica (*pau-branco) and *Erica azorica (*urze). *Columba palumbus azorica* (pombo-torcaz-dos-Açores) is also a resident of this area, while seabirds including *Calonectris borealis (*cagarro) and *Sterna hirundo* (garajau-comum) nest here, making it an Important Bird and Biodiversity Area (IBA).

The Protected Area for the Management of Habitats or Species of the South-West Coast (SJO03) occupies an area of 207.2 ha, beginning in the most westerly part of Morro Grande das Velas and extending along the south of the island to the boundary of the protected area of the Ponta dos Rosais Natural Monument. This is another IBA on São Jorge Island as it is a nesting site for *Sterna hirundo* (garajau-comum) and *Calonectris borealis* (cagarro). Where flora is concerned, the area is chiefly noted for species such as *Picconia azorica* (pau-branco), *Erica azorica* (urze) and *Myosotis maritima* (não-me-esqueças).

The Protected Area for the Management of Habitats or Species of Costa das Velas (SJO04), is a 62-hectare terrestrial zone stretching from Velas's marina to Urzelina. This zone is considered an Important Bird and Biodiversity Area (IBA) due to the migratory birds that nest along its coastal cliffs (*Calonectris borealis* - cagarro and *Sterna hirundo* - garajau-comum). Important species of flora include *Morella faya* (faia*)*, *Erica azorica* (urze) and *Picconia azorica* (pau-branco).

The Protected Area for the Management of Habitats and Species of Pico da Esperança and the Central Plateau (SJO05), is a 1,087.22 ha area located in the centre of the island. It contains its highest point, Pico da Esperança, which rises to a height of around 1,053 metres. From here it is possible to observe the alignment of the volcanic cones that traverse the island from one end to the other.

This site is relatively well preserved and can be considered a privileged habitat for fauna. In fact, this is the only place in the world where it is possible to observe species of arthropods such as *Trechus jorgensis*, *Trechus isabelaei* and *Cheiracanthium jorgeense.*

Gallinago gallinago (narceja) is the best represented bird species on this site, which also hosts several migratory birds.

In terms of flora, a significant number of native and endemic species exist here, including *Leontodon filii* (patalugo-maior), *Tolpis azorica, Erica azorica* (urze), *Hypericum foliosum* (furalha), *Potentilla anglica, Huperzia dentata, Osmunda regalis* (feto-

real), *Calluna vulgaris* (rapa), *Blechnum spicant* and *Holcus rigidus*, which are excellent representatives of Macaronesian Mesophile Grasslands (6180).

Rare vascular plants such as *Chaerophyllum azoricum, Euphrasia grandiflora, Scabiosa nitens, Rumex azoricus* (labaça-das-ilhas), *Platanthera pollostantha* and *Platanthera micrantha* (conchelo-do-mato) are also common in this area, which is the only known place in the world where it is possible to find *Platanthera azorica*, the rarest orchid in Europe.

Some of these species would not be able to exist without the peat bogs found on this site. In fact, it was because of the hydrological conditions and the diversity of dominant endemic and native plants on São Jorge's central plateau that this area was designated as a RAMSAR Site in 2008.

The Protected Area for the Management of Habitats or Species of Fajã das Almas (SJO06) occupies an area of around 97 ha on the island, including the slopes of Fajã das Almas. Being a coastal area, it is inhabited by seabirds such as *Calonectris borealis (*cagarro) and *Sterna hirundo* (garajau-comum), making it an Important Bird and Biodiversity Area (IBA). Species such as *Erica azorica* (urze), *Picconia azorica* (pau-branco) and *Morella faya* (faia) are only a few of the examples of flora that can be found in this area.

The Protected Area for the Management of Habitats or Species of Costa do Topo (SJO07) occupies a terrestrial area of around 387.8 ha, bounded by the Funda River and the Lixívias River. This area is designated as an Important Bird and Biodiversity Area (IBA) due to the diversity of birds that nest along its coast, which include *Sterna dougallii* (garajau-rosado) and *Sterna hirundo (*garajau-comum). Where flora is concerned, the area is home to a great diversity of species, such as *Azorina vidalii* (vidália), *Euphorbia stygiana* (trovisco-macho) and *Juniperus brevifolia* (cedro-do-mato).

The Islet of Topo is a protected zone that has been designated as a Protected Area for the Management of Habitats or Species of the Islet of Topo (SJO08). Owing to the small size and isolation of this area of land, it is floristically poor although *Festuca petraea* (bracel-da-rocha) can be found. However, seabirds such as *Calonectris borealis* (cagarro), *Sterna hirundo (*garajau-comum) and *Sterna dougallii* (garajau-rosado) are frequently seen on this islet, granting it the status of an Important Bird and Biodiversity Area (IBA).

The Protected Area for the Management of Habitats or Species of Fajãs do Norte (SJO09) is a 2,926-hectare area that extends from the river mouth at Fajã Isabel Pereira to the Protected Area for the Management of Habitats or Species of Costa do Topo (SJO07). Whilst this protected area includes a large number of *fajãs*, the most important are Fajã dos Cubres and Fajã da Caldeira de Santo Cristo, due to their lagoons. These lagoon systems are unique in the Azores and provide shelter for various migratory and nesting species such as *Ardea cinerea* (garça-real), *Numenius phaeopus* (maçarico-galego), *Sterna hirundo* (garajau-comum) and *Calonectris borealis* (cagarro). Because of their lagoons, these *fajãs* are protected under the RAMSAR Convention. The lagoon at Fajã da Caldeira de Santo Cristo is the only one in the Azores that contains *Ruditapes decussatus* (clams).

The protected area also includes the most well-known hiking trail on São Jorge, the Serra do Topo – Fajã da Caldeira de Santo Cristo – Fajã dos Cubres Trail, which offers users the chance to observe a great diversity of flora up close. The trail begins at Serra do Topo at a height of about 700 metres and ends at sea level, allowing one to observe the influence of altitude on plants as one descends towards the *fajãs*. In the high areas where the path begins, one of the most interesting plant communities in the Azores can be found:

the afforested juniper peat bogs. A little lower down, one can observe a large community of ferns, the most noteworthy of which are endemic species such as *Polypodium azoricum* (polipódio), *Asplenium azoricum* and *Dryopteris azorica*. Further down still is an area in which the vegetation is dominated by woody plants such as *Daboecia azorica (*queiró), *Erica azorica* (urze), *Juniperus brevifolia* (cedro-do-mato) and *Vaccinium cylindraceum (*uva-da-serra). Finally, at the lowest level, coastal plants such as *Azorina vidalii* (vidália) and *Spergularia azorica* can be observed.

In these *fajãs*, the architecture and testaments of traditional agriculture are evident, conferring great historical and cultural value on them. Indeed, the interaction between local populations and nature has uniquely shaped the area's character, making it valuable from an ecological, biological and cultural perspective. These characteristics, which indicate a nearly symbiotic relationship between humans and nature, are what make these areas worthy of preservation and conservation.

Areas of international importance with respect to natural heritage have been identified and regulated. On São Jorge, they have been classified into 2 Special Areas of Conservation (SAC) and 1 Special Protection Area (SPA).

The Northwest Coast and Ponta do Topo SAC (PTJOR0014), which occupies a total area of 3,965.15 ha (389.30 ha of which is a marine area), is home to many elements listed in the Habitats Directive. This is one of the biologically richest protected areas in terms of rare species, including *Chaerophyllum azoricum*, *Ammi trifoliatum* and *Scabiosa nitens*, which are found in high numbers and cover the most area of any other site. This area also contains a large number of habitats that are representative of the Azores, including: Annual vegetation of drift lines; Vegetated sea cliffs with endemic flora of the Macaronesian coasts; Blanket bogs (active bogs); Endemic forests with *Juniperus* spp.; the largest number of Coastal lagoons (priority habitat); Perennial vegetation of stony banks; *Spartina* swards (*Spartinion maritimae*); Mediterranean salt meadows (*Juncetalia maritimi*); and Endemic macaronesian heaths, which are found in a highly natural state.

The coastal part of this SAC is also home to species of seabirds such as *Calonectris borealis* (cagarro), *Sterna dougallii* (garajau-rosado) and *Sterna hirundo* (garajau-comum) and various terrestrial birds, including *Columba palumbus azoricus* (pombo-torcaz-dos-Açores).

The Ponta dos Rosais SAC (PTJOR0013) is a coastal site dominated by coastal cliffs with endemic vegetation, *Erica* heaths and pasture areas. The extraordinary power of the natural elements at this end of the island shapes the ecological uniqueness of the area, where mountain formations combine with coastal elements.

This area is unique in that it contains a population of *Rumex azoricus*, a protected species that forms communities in very few locales.

This SAC, which occupies a total area of 307.08 ha (389.30 ha of which is a marine area), contains four habitats and terrestrial species listed in the Habitats Directive.

In the marine area, the highly irregular bottom includes several small caves and crevices. The biotopes found there are typical of very exposed areas.

The more hydrodynamic area, associated with depths of up to 5 metres, is dominated by coralline encrusting algae, with some patches of *Ulva* spp. At greater depths, *Cystoseira* sp., *Halopteris filicina*, *Asparagopsis armata*and *Litophylum* sp. can be found. As the depth increases, so does the occurrence of patches of *Padina pavonica,* which are then replaced in the deeper zones by *Zonaria tournefortii*. Large shoals of pelagic fish are frequently observed in this area.

The Islet of Topo and Adjacent Coast SPA (PTZPE0028), which occupies 369.75 ha, includes the coastal cliffs between the Cabeço da Cruz River and Fajã do Nortezinho and the coastal islets. It contains a highly diverse range of priority seabirds listed in Annex I of the Birds Directive. This is particularly true of the Islet of Topo, where the following species nest: *Sterna dougallii* (garajau-rosado), *Sterna hirundo* (garajau-comum), *Puffinus assimilis baroli* (frulho), *Hydrobates castro* (angelito) and *Calonectris borealis* (cagarro).

The areas covered by the SPA and the surrounding zone are home to 6 identified species of flora listed in Annex II of the Habitats Directive, namely: *Ammi trifolatum* (pé-de-pomba), *Azorina vidalii* (vidália), *Spergularia azorica*, *Scabiosa nitens*, *Erica azorica* (urze) and *Rumex azoricus* (labaça-das-ilhas).

Nyctalus azoreum (morcego-dos-Açores), the only mammal that is endemic to the Azores, as well as the bird subspecies *Columba palumbus azoricus* (pombo-torcaz-dos-Açores), are evenly distributed within this SPA.

14.1.3. WHAT KIND OF PROTECTION REGIMES (INCLUDING CUSTOMARY AND TRADITIONAL) EXIST FOR THE CORE AREAS AND THE BUFFER ZONES?

The Autonomous Region of the Azores has developed strategies and adequate instruments for the preservation of environmental values. It incorporates a network of protected areas that meets the classification adopted by the International Union for Conservation of Nature (IUCN) and includes all of the classified areas that currently exist in the territory.

In this context, the São Jorge Natural Park, the management unit for the island's classified areas, contains 13 protected areas: One Natural Monument, seven Protected Areas for the Management of Habitats/Species, one Protected Landscape Area, and four Protected Areas for the Management of Resources.

São Jorge Island is also home to internationally important classified areas which are nesting sites for important bird species, many of which are listed in Annex I of the Birds Directive and contain habitats and rare plant and animal species listed in Annex II and IV of the Habitats Directive. The island contains 3 areas that belong to the Natura 2000 Network – 1 Specially Protected Area (SPA) and 2 Special Areas of Conservation (SAC) – and 23 natural habitats listed in Annex I of the Habitats Directive, of which 6 are considered priority habitats.

The legal frameworks pertaining to these protected areas implement public policies on nature conservation, resource management and spatial planning and management, matching the regulation of economic activities to the preservation of environmental values to forge a clear link between sustainability and development.

Figure 99. Natura 2000 Network of São Jorge Island

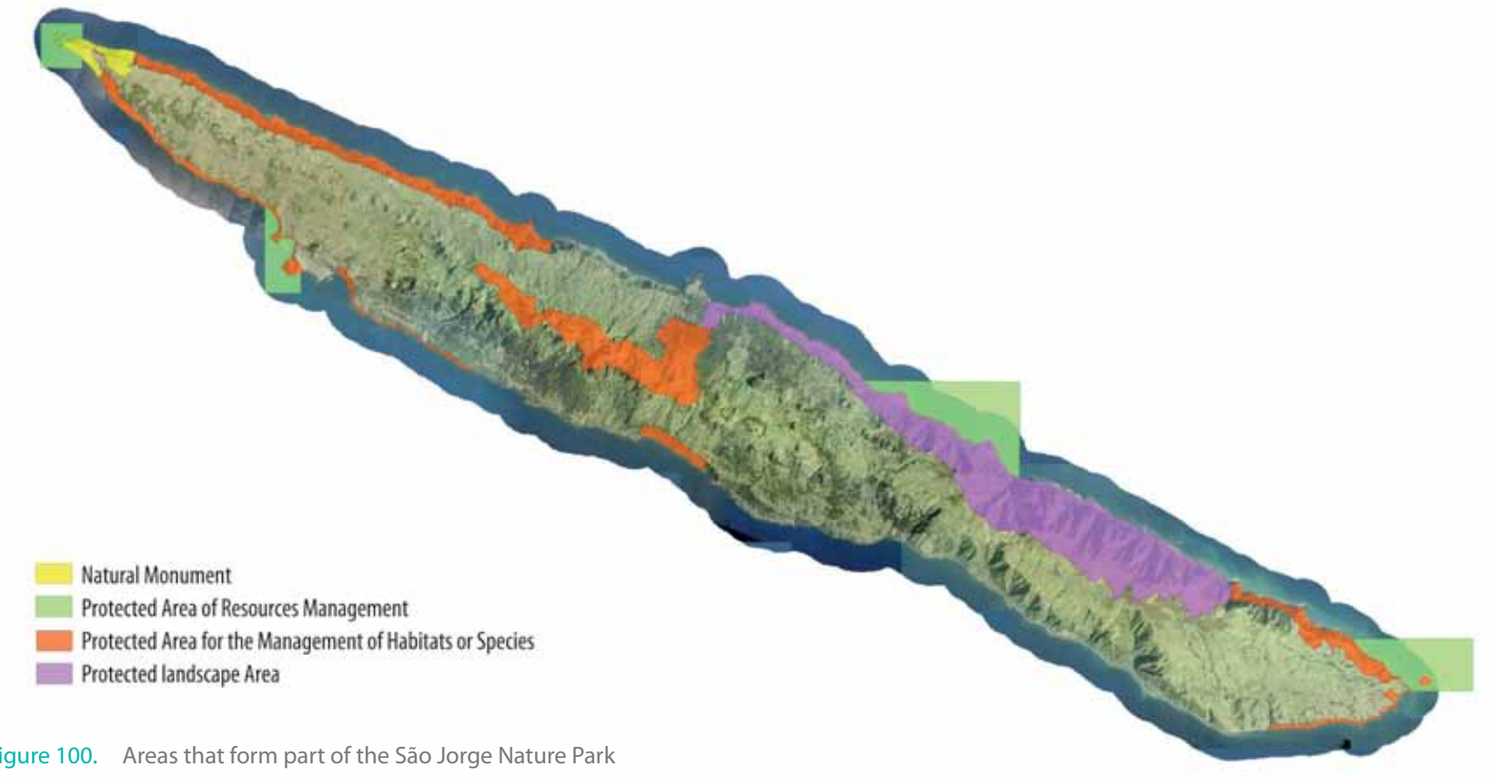


Figure 100. Areas that form part of the São Jorge Nature Park

Regional Legislative Decree no. 15/2012/A of 2 April, which establishes a legal framework for nature and biodiversity conservation and the safeguarding of protected species, prohibits the collection, cutting, uprooting and destruction of plants or parts of indigenous plants in their natural habitat and range. It also prohibits the collection, transportation, sale, exchange or supply of specimens of the aforementioned species that have been collected in their natural habitat.

In terms of animal species, this law also forbids the capture, killing or detention of specimens of protected species, whichever method might be employed, including their larvae, young, eggs or nests. It also prohibits the disturbance of animals, particularly during periods of reproduction, rearing, hibernation and migration. Furthermore, it prohibits the destruction, damage, collection or detention of species' nests and eggs, even if empty, and the deterioration or destruction of their breeding and nesting areas.

The designation of São Jorge Island as a Biosphere Reserve would strengthen ongoing efforts undertaken at the regional level to ensure and promote the conservation of the existing natural values, ensuring that they are in harmony with socio-economic development.

14.1.4. WHICH INDICATORS OR DATA ARE USED TO ASSESS THE EFFICIENCY OF THE ACTIONS/STRATEGY USED?

The management reports of the island's natural parks and the results of specific species and habitat conservation programmes are used as tools for evaluating the effectiveness of actions with respect to nature and biodiversity conservation. The preparation of species and habitats lists with their respective conservation statuses complements the series of tools used as indicators for monitoring.

14.2. AT THE LEVEL OF SPECIES AND ECOSYSTEM DIVERSITY

The island of São Jorge contains 185 species that are endemic to the Azores. This wealth is particularly significant in terms of terrestrial vegetation and invertebrates.

São Jorge alone contains 60 of the 80 plant species and sub-species that are endemic to the Azores; these include vascular plants such as the recently re-discovered orchid *Platanthera azorica*.

On a smaller scale, but no less significant in terms of biodiversity, are invertebrates, of which the most well-known are molluscs (limpets and barnacles) and arthropods (centipedes, spiders, insects). One hundred and fourteen species and sub-species of molluscs have been recorded in the Azores, of which 49 are endemic (27 occur in São Jorge), while 2,298 species and sub-species

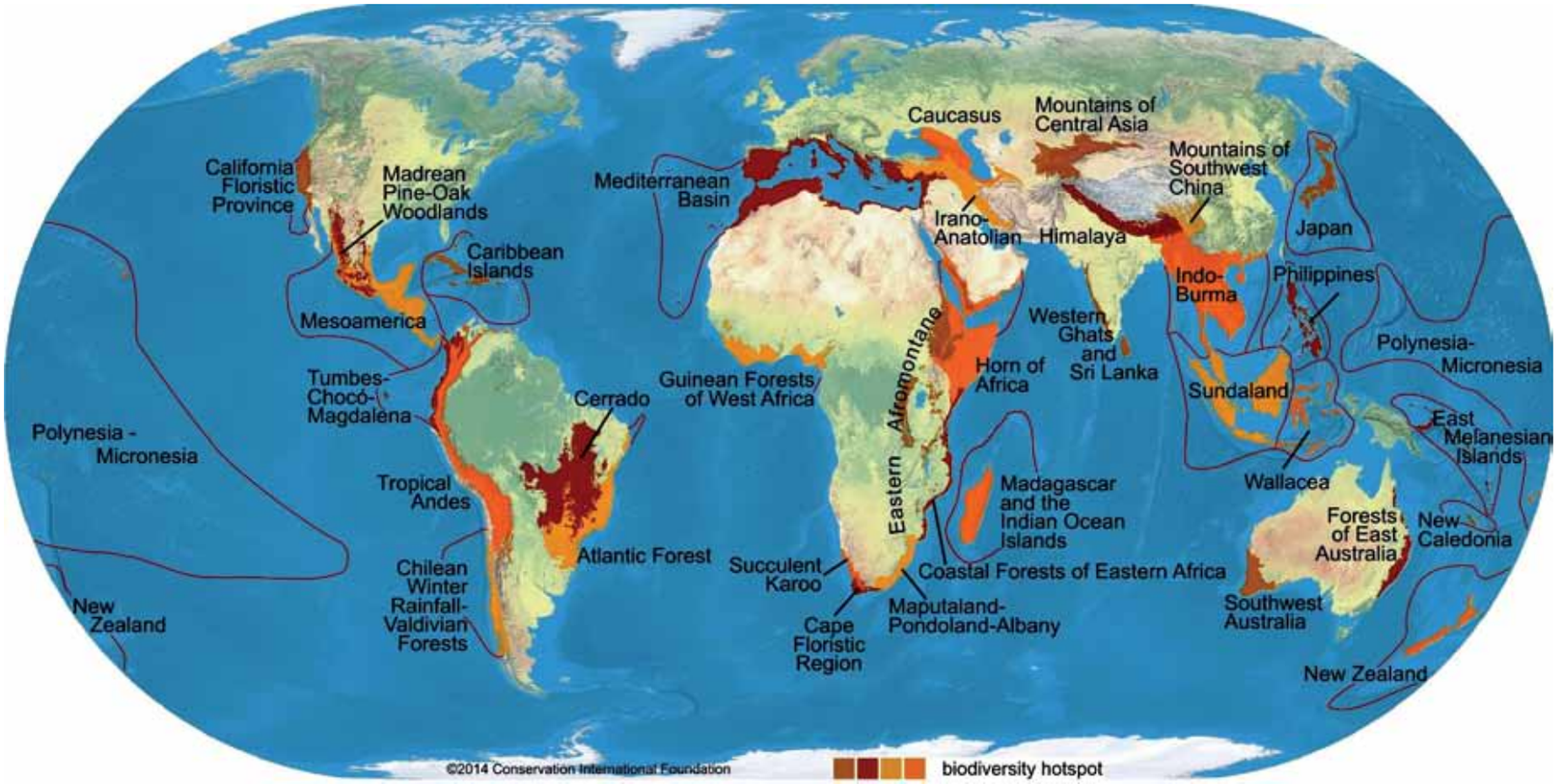


Figure 101. Biodiversity Hotspots

of arthropods have been found, 266 of which exist only in the archipelago (86 of them on São Jorge). Several of these species are endemic to just one island. For instance, seven species of arthropod are known to exist only on São Jorge. These species live in native forests, inhabiting the crowns of endemic trees and bushes. The species *Cheiracanthium jorgense* (aranha-caçadora-de-São Jorge) is found in the crowns of *Laurus azorica* (louro) and *Ilex azorica* (azevinho).

This high concentration of endemic species has earned the Azores archipelago's inclusion on the list of the world's 35 biodiversity hotspots of the Conservation International, which means the proposed Biosphere Reserve has an important role to play in conserving this natural heritage.

14.2.1. IDENTIFY MAIN GROUPS OF SPECIES OR SPECIES OF PARTICULAR INTEREST FOR THE CONSERVATION OBJECTIVES, ESPECIALLY THOSE THAT ARE ENDEMIC TO THIS BIOSPHERE RESERVE, AND PROVIDE A BRIEF DESCRIPTION OF THE COMMUNITIES IN WHICH THEY OCCUR

Natural habitats listed in Annex I of the Habitats Directive and protected species listed in Annex II of the same directive have been identified in the terrestrial and marine areas of the Fajãs de São Jorge Biosphere Reserve, as follows:

Natural terrestrial habitats listed in Annex I of the Habitats Directive

- Coastal lagoons (1150)*
- Annual vegetation of drift lines (1210)
- Perennial vegetation of stony banks (1220)
- Vegetated sea cliffs with endemic flora of the Macaronesian coasts (1250)
- Spartina swards (Spartinion maritimae) (1320)
- Mediterranean salt meadows (Juncetalia maritimi) (1410)
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea (3130)
- Natural dystrophic lakes and ponds (3160)
- Endemic macaronesian heaths (4050)*
- Macaronesian mesophile grasslands (6180)
- Active raised bogs (7110)*
- Degraded raised bogs still capable of natural regeneration (7120)
- Blanket bogs (* if active bog) (7130)
- Siliceous rocky slopes with chasmophytic vegetation (8220)
- Siliceous rock with pioneer vegetation (8230)
- Caves not open to the public (8310)
- Macaronesian laurel forests (9360)*
- Endemic forests with Juniperus spp. (9560)*
- Thermo-Mediterranean and pre-desert scrub (5330)

Natural marine habitats listed in Annex I of the Habitats Directive

- Large shallow inlets and bays (1160)
- Reefs (1170)
- Submerged or partially submerged sea caves (8330)

Plant species listed in Annex II of the Habitats Directive

- *Ammi trifoliatum* (Pé-de-pomba)
- *Arceuthobium azoricum* (Espigos-de-cedro)
- *Azorina vidalli** (Vidália)
- *Chaerophyllum azoricum*
- *Culcita macrocarpa* (Feto-do-cabelinho)
- *Erica azorica* (Urze)
- *Euphorbia stygiana* (Tovisco-macho)
- *Euphrasia grandiflora*
- *Frangula azorica* (Sanguinho)
- *Isoetes azorica*
- *Myosotis maritima* (não-me-esqueças)
- *Picconia azorica* (Pau-branco)
- *Prunus azorica* (Ginja)
- *Rumex azoricus* (Labaça-das-ilhas)
- *Sanicula azorica* (Erva-do-capitão)
- *Scabiosa nitens*
- *Spergularia azorica*
- *Trichomanes speciosum*
- *Woodwardia radicans* (Feto-do-botão)

Animal species listed in Annex II of the Habitats Directive

- *Tursiops truncatus* (Roaz)
- *Caretta caretta** (Tartaruga-careta)

14.2.2. WHAT ARE THE PRESSURES ON KEY SPECIES?

The proposed Biosphere Reserve suffers from various pressures that could become potential threats to the preservation and conservation of habitats and species.

One of the biggest threats, which has a direct impact, is the development and expansion of economic activities such as animal farming, which leads to the alteration of natural vegetation from trampling, herbivory and the eutrophication and silting of wetlands.

Although animal farming is the most important activity in the island's economy, its growth is occurring not through an expansion of farmland within protected areas, but in a more sound manner through the reconversion of degraded areas or zones devoid of natural habitat or species.

On the other hand, untrammelled tourism could also subject protected areas to increased pressures and threats, including the destruction of natural vegetation by trampling and by disturbing nesting areas for birds.

14.2.3. WHAT KIND OF MEASURES AND INDICATORS ARE CURRENTLY USED, OR PLANNED TO BE USED TO ASSESS BOTH SPECIES GROUPS AND THE PRESSURES ON THEM?

The proposed Biosphere Reserve will continue to use the mitigative and preventive measures that currently exist in various legal instruments to control threats and pressures. In addition to permanent monitoring, indices will be developed and regularly calculated to measure the carrying capacity of each activity in protected areas.

Environmental education and awareness-raising is another instrument that will be regularly used, in addition to the monitoring and enforcement carried out by the São Jorge Natural Park through its teams of nature wardens.

14.2.4. WHAT ACTIONS ARE CURRENTLY UNDERTAKEN TO REDUCE THESE PRESSURES?

The São Jorge Natural Park carries out a wide array of activities aimed at reducing pressures on the proposed Biosphere Reserve, including:

- The maintenance, conservation and upkeep of protected areas;
- The conservation and protection of sensitive habitats and species, which include activities to control and eradicate invasive species;
- Monitoring and enforcementof environmental laws;
- The promotion of sustainable uses and activities within protected areas;
- The promotion of sound management and the promotion of renewable natural resources;
- Raising awareness of the island's sustainable development;
- The application and enforcement of various legal instruments.

14.2.5. WHAT ACTIONS DO YOU INTEND TO TAKE TO REDUCE THESE PRESSURES?

The services performed by São Jorge Natural Park, which ensure that the current environmental norms are complied with, have preserved the high quality of the landscapes in the proposed Fajãs de São Jorge Biosphere Reserve, and the richness of its endemic biodiversity in conjunction with the sustainable development of the island's main economic activities, such as animal farming, fisheries and tourism.

Aside from continuing the actions described above, however, a programme will be developed to monitor the different areas of the proposed Biosphere Reserve.

14.3. AT THE LEVEL OF GENETIC DIVERSITY

14.3.1. INDICATE SPECIES OR VARIETIES THAT ARE OF IMPORTANCE (E.G. FOR CONSERVATION, MEDICINE, FOOD PRODUCTION, AGROBIODIVERSITY, CULTURAL PRACTICES ETC).

The genetic and natural heritage of the Azores archipelago contains an enormous potential. The existence of natural elements unique to São Jorge should be valued and its sustainable use encouraged.

The protection and preservation of biological diversity to ensure the perpetuity of the full genetic potential of native and especially endemic species, is assured by the creation and active conservation of protected areas. However, the creation of a Biosphere Reserve would strengthen it and help ensure its survival.

Commercial agriculture, based on corn and potatoes, is mainly dependent on seeds originating from beyond the islands. Subsistence or complementary agriculture, which is practised by the majority of families on São Jorge, is dominated by the production of wine, legumes, vegetables and tubers, including yam and sweet potato.

In terms of fruit trees, one can found figs, bananas, loquat, cattley guava, and oranges, with oranges being the predominant fruit.

Coffee production (*Coffea arabica*) also exists. In the past, coffee was produced in large quantities on some *fajãs* and was popular throughout the island. Currently, however, the industry is in danger of going extinct due to the handful of individual producers that remain.

The designation of the Fajãs de São Jorge Biosphere Reserve strengthens the importance of conserving genetic resources by preserving and protecting an important heritage, particularly for local agriculture, and ensuring the preservation and maintenance of agro-biodiversity, which will enable its characteristic ecosystems to endure.

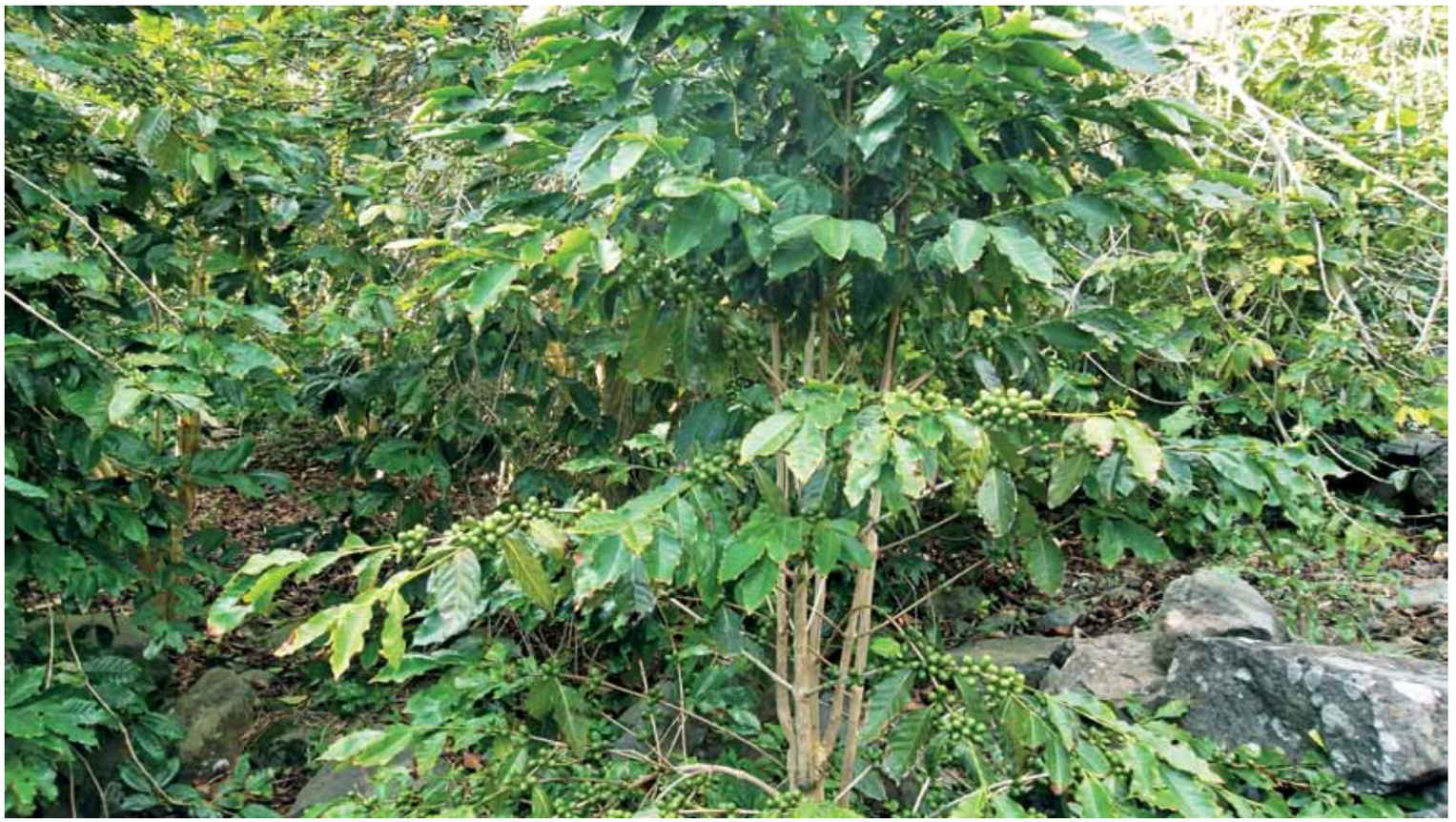


Figure 102. Coffee plantation (*Coffea arabica*) at Fajã dos Vimes

Although there is a lack of information on the cultivated plant varieties that are specific to São Jorge, a study in this area would likely prove revelatory, given that artisanal processes of sequential reproduction naturally create conditions for the selection of varieties that are adapted to local conditions.

14.3.2. WHAT ECOLOGICAL, ECONOMIC OR SOCIAL PRESSURES OR CHANGES MAY THREATEN THESE SPECIES OR VARIETIES?

Potential risks in terms of threats to biodiversity include activities that do not respect natural areas, such as vehicular access or hiking and camping in areas that are not fit or specifically geared for those activities.

Eventual growth in tourism could lead to the increased presence of humans and human activities in natural areas, which would carry potential risks of contamination from waste and the presence of motorised vehicles. This could in turn contribute to potential soil degradation and an increase in areas exposed to erosion.

14.3.3. WHAT INDICATORS, AT THE LEVEL OF THE SPECIES, ARE USED, OR WILL BE USED, TO ASSESS THE EVOLUTION OF POPULATION STATUS AND ASSOCIATED USE?

Lists of endemic and indigenous fauna and flora and lists of exotic and invasive species are regularly updated, enabling the evolving trends of the conservation status of species to be monitored and updated (e.g. Red Lists), thereby ensuring appropriate management.

14.3.4. WHAT MEASURES WILL BE USED TO CONSERVE GENETIC DIVERSITY AND PRACTICES ASSOCIATED WITH THEIR CONSERVATION?

Portugal is a party to the Convention on Biological Diversity[38], one of the most important international treaties in the area of nature conservation and the environment.

Within the scope of the Convention on Biological Diversity and the Nagoya Protocol[39], the Azores Autonomous Region provides a legal framework for accessing and using natural resources for scientific purposes[40], which includes biological and genetic resources and their derivatives and sub-products; air; water; minerals; and the soil. Added to this is the entire legal and operational structure of the Azores Government, which gives shape to the strategy for conserving nature and biodiversity through a system of protected areas and specific programmes to manage habitats and species with conservation status.

The Fajãs de São Jorge Biosphere Reserve intends to develop educational and awareness-raising activities to make local populations and tourists more conscious of species and ecosystem conservation. This will include the creation of best practices manuals for sectors of the economy that deal with natural areas and biodiversity.

38 The Convention was ratified by Portugal through Decree no. 21/93 of 21 June, which entered into force on 21 March 1994.

39 It was adopted by the contracting parties to the Convention on Biological Diversity in October 2010, with a view towards the fair and equitable sharing of benefits arising from the use of genetic resources.

40 It was approved by Regional Legislative Decree no. 9/2012/A of 20 March and amended by Regional Legislative Decree no. 20/2012/A of 5 November.

15. DEVELOPMENT FUNCTION

15.1. POTENTIAL FOR FOSTERING ECONOMIC AND HUMAN DEVELOPMENT WHICH IS SOCIO-CULTURALLY AND ECOLOGICALLY SUSTAINABLE

15.1.1. DESCRIBE HOW AND WHY THE AREA HAS POTENTIAL TO SERVE AS A SITE OF EXCELLENCE/MODEL REGION FOR PROMOTING SUSTAINABLE DEVELOPMENT.

São Jorge Island provides exceptional conditions, in terms of natural, cultural and heritage resources, for the promotion of sustainable development. This is particularly true in the area of responsible tourism, combining sightseeing and the enjoyment of a unique landscape with biodiversity, a rich cultural heritage (cuisine, music, traditions) in terms of tourist animation and a wide array of high quality agricultural and fish products to complement this singular experience.

In this sense, the Fajãs de São Jorge Biosphere Reserve undoubtedly performs the functions of a biosphere reserve, whose stakeholders are committed to:

- Making the conservation of biodiversity and landscapes the core element of local development;
- Strengthening economic and social development by combining the conservation and sustainable use of nature with the valorization of cultural identity;
- Attracting and developing demonstration, education, information and training projects in the fields of the environment, culture, heritage and the green economy, along with programmes for monitoring and assessing ecosystems and activities and active participation in international, regional and thematic Biosphere Reserve networks.

In addition, the Fajãs de São Jorge Biosphere Reserve fulfils all of the criteria set out for Biosphere Reserves, namely in:

- Having every type of land and sea ecosystems in its biogeographical region represented;

- Having a highly representative biological diversity characterised by a large number of endemic species of fauna and flora, including endangered and vulnerable species and habitats, and ecosystems that have been classified as protected areas, Natura 2000 Network sites and RAMSAR sites;
- Having a well documented history of interaction between humans and nature in the Fajãs, which attests to its potential for demonstrating experiences and methods of sustainable land use. This is now bolstered by the desire of local people and public authorities to implement a model of sustainable development for the island based on the territory's designation as a Biosphere Reserve.

The zoning and size of the proposed Biosphere Reserve (covering the entire area of São Jorge Island and an adjacent marine area) ensure the complete fulfilment of the conservation, development and logistical support functions.

By promoting the involvement and sharing of experiences with other Biosphere Reserves in the Azores and similar regional or thematic networks, the Fajãs de São Jorge Biosphere Reserve will contribute to strengthening the role of the Biosphere Reserves at the regional level as spaces of reference for promoting sustainable development, thereby leading to the adoption of similar practices in other areas of the Archipelago.

15.1.2. HOW DO YOU ASSESS CHANGES AND SUCCESSES (WHICH OBJECTIVES AND BY WHICH INDICATOR)?

Monitoring of the processes associated with nature conservation and sustainable development is carried out through the assessment and monitoring of sectoral plans and programmes, especially in the following areas: environment, natural resources, education, research, demographics, jobs, economic activities, and spatial and urban planning.

The Autonomous Region of the Azores possesses a specific legal framework for assessing environmental impacts and licensing[41]. It aims to evaluate the effects of specific plans and programmes on the environment and assess the impacts of public and private projects that are likely to have a significant effect on the environment, thereby imposing the need to subject certain activities to an environmental licensing process.

Meanwhile, the Government of the Azores aims to change the competences of the Observatory on Land and Sustainability (Observatório do Território e da Sustentabilidade - OTS)[42] to reinforce its capacity to monitor and assess sustainable development practices throughout the entire Azores archipelago, particularly in the Biosphere Reserves of the Azores.

41 Approved by Regional Legislative Decree no. 30/2010/A of 15 November.

42 The Observatory on Land and Sustainability (Observatório do Território e da Sustentabilidade - OTS) was established by Article 176 of Regional Legislative Decree no. 35/2012/A of 16 August.

15.2. IF TOURISM IS A MAJOR ACTIVITY:

15.2.1. DESCRIBE THE TYPE(S) OF TOURISM AND THE TOURISTIC FACILITIES AVAILABLE.

The tourism sector on São Jorge Island is still in its infancy despite the growth that it saw in 2014. However, green tourism, associated with nature sightseeing, bird watching, trail hiking, whale watching and other outdoor activities has shown increasing potential.

Current experiences are based on the principles of responsible tourism, particularly the assessment of carrying capacity and respect for the fragilities of ecosystems. This type of tourism has been showing great potential in terms of the use of smaller-scale infrastructures such as traditional houses, instead of the construction of new hotels, which is an important action for preserving the landscape.

In 2014, São Jorge Island had 15 lodging facilities for tourists, divided into the following categories: hotels (3), rural tourism (4), youth hostel (1), local housing (5) and camp sites (2).

At the end of the year, the lodging capacity of both hotels and rural tourism was 311 beds.

15.2.2. HOW MANY VISITORS COME TO THE PROPOSED BIOSPHERE RESERVE EACH YEAR?

According to data provided by the Azores Regional Statistics Service (SREA), 11,001 tourists visited São Jorge Island in 2014[43], which corresponded to 25,640 overnight stays.

An analysis of tourism statistics regarding the proposed Biosphere Reserve shows that 2014 was the best year in the last decade, reversing the losses that have been registered since 2011.

The majority of the tourists are Portuguese (57.7%) while the largest numbers among foreign visitors are German (12.2%), French (6.2%) and Dutch (4.4%).

Although the number of tourists who visit the proposed Biosphere Reserve is not high, the seasonality of tourism flows can be easily observed. The number of overnight stays increases after mid-June and reaches its peak in July and August, significantly decreasing after mid-September.

43 These figures do not include rural tourism facilities, since there is no available data for these.

Figure 103. Tourism facility in the rural area of Rosais

Figure 104. Surfing at Fajã da Caldeira de Santo Cristo

15.2.3. HOW ARE TOURISM ACTIVITIES CURRENTLY MANAGED?

The Fajãs de São Jorge Biosphere Reserve shows potential for tourism development, particularly nature tourism, which values landscapes and direct contact with nature by means of hiking, outdoor sports, bird watching, whale and dolphin watching and scuba diving.

Tourists are increasingly interested in acquiring new knowledge about, and participating in, experiences offered by the island's natural environment, its built heritage, traditions and customary practices, architecture, handicrafts, ethnography and local products.

To address the various aspects related to tourism demand, the Autonomous Region of the Azores has created a Tourism Management Plan (POTRAA), whose main function is to ensure that tourism develops in a sustainable manner, balancing social, cultural and environmental aspects and focusing on the promotion of heritage and natural resources. POTRAA promotes quality tourism and the safeguarding of tourism potential that does not harm the environment.

Besides POTRAA, the Azores also has other specific legal frameworks for controlling tourist and entertainment activities that may cause an impact on natural resources. These laws specifically regulate nature tourism[44], hiking trails[45], marine tourism[46], fisheries tourism[47], recreational fishing[48] and whale watching[49].

44 Regional Legislative Decree no. 34/2004/A of 27 August.

45 Regional Legislative Decree no. 30/2012/A of 3 July.

46 Regional Legislative Decree no. 23/2007/A of 23 October.

47 Regional Legislative Decree no. 36/2008/A of 30 July.

48 Regional Legislative Decree no. 9/2007/A of 19 April.

49 Regional Legislative Decree no. 9/99/A, of 22 March, amended by Regional Legislative Decree no. 10/2003/A, of 22 March.

15.2.4. INDICATE POSSIBLE POSITIVE AND/OR NEGATIVE IMPACTS OF TOURISM AT PRESENT OR FORESEEN AND HOW THEY WILL BE ASSESSED?

The potentially positive impacts of tourism growth can be seen in different sectors. The first impact is on the job market by creating opportunities for diversification through the provision of tourism services. These range from the hiring of nature guides, the supply of services and equipment related to outdoor activities, the creation of guidebooks and programmes that combine nature, culture and heritage, and the use of local products to create an integrated tourism experience that respects the environment. These impacts will also have positive effects in terms of the sale of local products from agriculture and fisheries, which will help to produce more income for families.

The potential negative impacts are the increased number of people visiting natural areas, which may lead to more pressure on natural resources and ecosystems.

Assessment of these impacts will be carried out by means of regular monitoring mechanisms, based on the establishment of the carrying capacities of the protected areas, as well as through specific regulations on their uses, taking into account the life cycles of the species and other variables that significantly affect the conservation of biological diversity and landscapes.

15.2.5. HOW WILL THESE IMPACTS BE MANAGED, AND BY WHOM?

Existing laws and competences for monitoring and regulating tourism and entertainment adequately ensure compliance with the standards and principles of responsible tourism. These will be strengthened through training, education and environmental information programmes and the implementation and promotion of responsible tourism certification systems[50].

15.3. AGRICULTURAL (INCLUDING GRAZING) AND OTHER ACTIVITIES (INCLUDING TRADITIONAL AND CUSTOMARY):

15.3.1. DESCRIBE THE TYPE OF AGRICULTURAL (INCLUDING GRAZING) AND OTHER ACTIVITIES, AREA CONCERNED AND PEOPLE INVOLVED (INCLUDING MEN AND WOMEN).

Agriculture on São Jorge Island is practised using traditional methods and techniques for working and using the land, on small farms located mainly in the *fajãs*.

50 This includes applying for certification from the European Charter for Sustainable Tourism in Protected Areas and Instituto de Turismo Responsable (ITR).

Figure 105. Land preparation using Ramo Grande oxen, a native breed

Figure 106. São Jorge Cheese DOP (at 3, 4, and 7 months of curing)

Figure 107. Cows in pasture on São Jorge Island

Figure 108. Tuna fishing using pole and line ("salto e vara")

The main crops are maize, potatoes, sweet potatoes, yam and grapes, as well as fruits and vegetables. Other agricultural products such as coffee are grown in small quantities and notable, on occasion, for their unique quality.

Although grape, yam and fruit cultivation played an important social and economic role in the past, it has very little significance today on São Jorge Due to the importance of some of these traditional activities in preserving a vibrant, sustainable landscape, the Government of the Azores has recently created an incentive scheme to maintain traditional landscapes for viniculture (rectangular plots and hill terraces) and orchards (containing traditional varieties) in protected landscape areas and coastal *fajãs* that form part of the island's natural parks and Biosphere Reserves[51].

51 Regional Regulatory Decree no. 24/2014/A of 15 December.

Livestock production is the main economic activity on São Jorge Island and is extensively developed on farms located mainly in high pastures, where it is not possible to generate other forms of income. This activity is directly associated with the production of cheese, one of the products of excellence from São Jorge Island.

From the time that humans practically first settled on São Jorge Island, its inhabitants have produced cheese as a food reserve. Characterised as a hard or semi-hard cheese witha strong aroma and flavour, this product is made exclusively of whole raw cow milk. Over time, its quality began to be recognised and other islands of the Azores started selling it as well.

Cheese from São Jorge acquired its current shape (cylindrical and large, weighing 8-12 kilos) at the beginning of the nineteenth century; in 1986, the Demarcated Region for São Jorge Cheese was created[52], covering the entire area of the island.

Every year, the island's four dairy cooperatives produce about 2,750 tonnes of cheese using an artisanal production process.

Cheese that meets the requirements for displaying the Denominação de Origem Protegida (DOP) [Protected Designation of Origin] label is certified by the São Jorge Cheese Guild, while all other cheese is sold locally under the "queijo ilha" (island cheese) label. The cooperatives are organised under the name Uniqueijo – União das Cooperativas Agrícolas de Lacticínios de São Jorge (UCRL) – for the purposes of product storage and commercialisation.

Although livestock production is primarily focused on milk production, meat is also produced for consumption. In 2014, 2,341 cattle were killed at the São Jorge Slaughterhouse, representing a net weight of 506.7 tonnes.

Agricultural and livestock production is extremely important on São Jorge Island, where it affects the rural landscape and involves the majority of the population. In this context, the branch of the PRORURAL programme dealing with rural development aims to invest in the improvement of the rural environment and landscape. To this end, 4 measures will be put into practice: maintenance of agricultural activity in disadvantaged areas; agro-environmental and Natura 2000 subsidies; non-productive investments; and forest management.

Fisheries is another traditional sector of great economic and social importance. In 2014, 110 tonnes of fish were landed on São Jorge Island, excluding tuna species destined for the canning industry.

The type of fishing practised on the island is small-scale, using small boats, many of them open (i.e. with no cabin), and has been managed in a way that is compatible with the preservation of the exploited resources.

In the case of tuna, fishers use natural bait and jets of water to attract shoals, after which the fish are caught using hook and line. This is a traditional form of fishing called "salto e vara" [pole and line], enabling fishers to select the best specimens, thereby safeguarding the preservation of the species and avoiding interference with other species, particularly dolphins, which come in contact with the shoals.

The Santa Catarina canning factory, located in the proposed Biosphere Reserve, is an example of perseverance and innovation in the canning industry. It employs 123 workers who are exclusively dedicated to tuna canning using artisanal methods.

52 Regional Regulatory Decree no. 24/86/A of 9 July.

Figure 109. Tuna canning using artisanal methods (Santa Catarina)

Figure 110. Packagings for Santa Catarina canned tuna

In 2014, the Santa Catarina factory processed 1,550 tonnes of tuna, corresponding to 7.5 million tins of canned tuna.

Since this is a highly selective and small-scale form of fishing, each Santa Catarina-produced tin displays the "dolphin safe", "friend of the sea", "pesca salto e vara" ("pole and line" fishing), "Qualidade Açores" (Azorean Quality), and – more recently – "certified sustainable sea food" labels. In 2011, Santa Catarina canned tuna was named by Greenpeace as the "the most sustainable tuna in the world".

15.3.2. INDICATE THE POSSIBLE POSITIVE AND/OR NEGATIVE IMPACTS OF THESE ACTIVITIES ON BIOSPHERE RESERVE OBJECTIVES

The aforementioned activities, particularly agriculture, livestock production and fisheries – which use extensive and traditionally small-scale methods based on specialty, high quality production – have positive impacts in terms of achieving the objectives set out for the proposed Biosphere Reserve: they encourageactivities that provide opportunities by associating small-scale production methods with the promotion and protection of natural landscapes, the promotion and strengthening of cultural identity and the conservation and sustainable management of natural resources.

15.3.3. WHAT INDICATORS ARE, OR WILL BE USED TO ASSESS THE STATE AND ITS TRENDS?

The indicators to be used are the following: number of jobs, productivity and economic revenue from such activities, and the degree to which incentive schemes financed by the Government of the Azores and EU Funds and focusing on rural development and the maintenance of traditional landscapes have been implemented.

15.3.4. WHAT ACTIONS ARE CURRENTLY UNDERTAKEN, AND WHICH MEASURES WILL BE APPLIED TO STRENGTHEN POSITIVE IMPACTS OR REDUCING NEGATIVE ONES ON THE BIOSPHERE RESERVE OBJECTIVES?

The existing licensing and inspection system regarding activities and investments provides mechanisms for encouraging best practices, greater efficiency and the minimisation of negative environmental impacts. In addition, the proposed Biosphere Reserve will develop best practice manuals and capacity-building actions, based on environmental management systems that will be adapted to the reality of micro businesses and local producers, thereby complementing the role of municipal and governmental authorities in the regulation of these activities.

These actions will be objective, proactive and strategic to enable an effective reduction of negative impacts in the proposed Biosphere Reserve.

15.4. OTHER TYPES OF ACTIVITIES POSITIVELY OR NEGATIVELY CONTRIBUTING TO LOCAL SUSTAINABLE DEVELOPMENT, INCLUDING IMPACT/INFLUENCE OF THE BIOSPHERE RESERVE OUTSIDE ITS BOUNDARIES

15.4.1. DESCRIBE THE TYPE OF ACTIVITIES, AREA CONCERNED AND PEOPLE INVOLVED

In the Biosphere Reserve, other types of activities are developed in addition to agriculture, livestock production and tourism, adding to the sustainable, economic and social development of the region.

The fisheries sector is inseparably linked to the history of the island. Now, fishing and fish processing are becoming increasingly important, involving the entire population and having major impacts on the island's social and economic life. Fishing on São Jorge Island is practised on a small scale and uses artisanal methods. Activities such as fish processing are growing in importance.

Whilst undeveloped to a large extent, artisanal fishing has shown great potential and could be explored to increase its supply.

Trade and services are complementary sectors that are being developed on São Jorge Island.

15.4.2. INDICATE THE POSSIBLE POSITIVE AND/OR NEGATIVE IMPACTS OF THESE ACTIVITIES ON BIOSPHERE RESERVE OBJECTIVES

Tourism, agriculture, livestock production and fisheries can generate positive impacts in terms of the objectives of the proposed Biosphere Reserve, if they promote the development of activities based on the sustainable use of resources and on the production of specialty, high-quality products.

15.4.3. WHAT INDICATORS ARE, OR WILL BE USED TO ASSESS THE STATE AND ITS TRENDS?

The indicators to be used are the following: number of jobs, productivity and economic revenue from such activities, and the degree to which specific incentive schemes financed by the Government of the Azores and EU Funds are implemented.

15.4.4. WHAT ACTIONS ARE CURRENTLY UNDERTAKEN, AND WHICH MEASURES WILL BE APPLIED TO STRENGTHEN POSITIVE IMPACTS OR REDUCING NEGATIVE ONES ON THE BIOSPHERE RESERVE OBJECTIVES?

The existing licensing and inspection system regarding activities and investments provides mechanisms for encouraging best practices, greater efficiency and the minimisation of negative environmental impacts. In addition, the proposed Biosphere Reserve will develop best practice manuals and capacity-building actions, based on environmental management systems that will be adapted to the reality of micro businesses and local producers, thereby complementing the role of municipal and governmental authorities in the regulation of these activities.

These actions will be objective, proactive and strategic to enable an effective reduction of negative impacts in the proposed Biosphere Reserve.

15.5. BENEFITS OF ECONOMIC ACTIVITIES TO LOCAL PEOPLE

15.5.1. FOR THE ACTIVITIES DESCRIBED ABOVE, WHAT INCOME OR BENEFITS DO LOCAL COMMUNITIES (INCLUDING MEN AND WOMEN) DERIVE DIRECTLY FROM THE SITE PROPOSED AS A BIOSPHERE RESERVE AND HOW?

As the proposed Biosphere Reserve covers the entire area of the São Jorge Island and an adjacent marine area, every economic activity developed in the reserve, as well as its respective income or benefits, has a direct impact on the island's inhabitants.

15.5.2. WHAT INDICATORS ARE USED TO MEASURE SUCH INCOME OR OTHER BENEFITS?

As the proposed Biosphere Reserve includes the entire area of São Jorge Island and an adjacent marine area, coveringthe entire population, general indicators will be used, such as gross domestic product (GDP), rate of employment, number of jobs created, implementation rates regarding local and regional development programmes, and the results of other sectoral interventions coordinated by the Government of the Azores, Municipalities and local private entities.

15.6. SPIRITUAL AND CULTURAL VALUES AND CUSTOMARY PRACTICES

15.6.1. DESCRIBE ANY CULTURAL AND SPIRITUAL VALUES AND CUSTOMARY PRACTICES INCLUDING LANGUAGES, RITUALS, AND TRADITIONAL LIVELIHOODS

There is a growing interest amongst the local population to preserve traditional festivities, especially from young people and cultural and ethnographic organisations.

In São Jorge, traditional popular festivities that were initially religious in nature are kept alive; however, they are now more significant from a cultural, artistic and social point of view. A good example of this is the Festival of the Holy Spirit, in which a wide range of activities related to food, social gatherings and other cultural events are held in addition to religious rituals.

Other festivities associated with religious and pagan aspects include the Day of the Kings (Epiphany), during which Ethnographic Groups go door to door to sing the *Reis*, i.e. songs about the life of Jesus; the Festival of St. George, held on 23 April, which celebrates the patron saint of the town of Velas; the Popular Saints Festival in June; the St. Catherine Festival, held on 25 November, which celebrates the patron saint of the town of Calheta; and the tradition of "singing to baby Jesus", from 23 to 30 December, in which people go from door to door to wish residents a "Merry Christmas and a Happy New Year".

Also worth noting are: Carnival, when traditional *filhoses* (sweet fried dough) are made;"Bodo de Leite", which takes place in Terreiro da Macela, Beira, on the last Sunday of June, during which people give away milk collected in the morning and traditional quilts are showcased on small stands; the Festival of the Immigrant in the parish of Manadas on the second week of July; Rope Bullfights, which take place during the summer in every parish; Cultural Week, organized by the Town Council of Velas on the first weekend of July; and the July Festival, organised by the Town Council of Calheta at the end of July.

15.6.2. INDICATE ACTIVITIES AIMED AT IDENTIFYING, SAFEGUARDING, PROMOTING AND/OR REVITALISING SUCH VALUES AND PRACTICES

One of the priorities for the Fajãs de São Jorge Biosphere Reserve is the promotion and enrichment of local traditions and culture through the establishment of demonstration workshops and activities to disseminate popular cultural traditions and arts. Both aim to foster interactions between different generations, enabling young people to learn from the knowledge and experience of elders.

In this context, activities have been developed by several bodies, from the Directorate for Culture to municipalities, parish councils, non-governmental organisations and individuals who work together to keep alive some of the island's traditions. One of the best examples is the Festival of St. Martin in Fajã d'Além (North), an event entirely organised and sponsored by local residents, who invite the general population to participate in a lunch and social gathering.

The "Voar no tear" (flying on a weaving loom) course was organised by the Regional Directorate for Culture to show young people how traditional local weaving is done. This is an example of the events often organised by the Directorate to raise awareness of local traditions.

15.6.3. HOW SHOULD CULTURAL VALUES BE INTEGRATED IN THE DEVELOPMENT PROCESS: ELEMENTS OF IDENTITY, TRADITIONAL KNOWLEDGE, SOCIAL ORGANIZATIONS, ETC.?

São Jorge Island's main traditional economic activities (cheese production, agriculture and fishing) and emerging activities such as tourism and tuna canning rely heavily on a unique mode of interaction between humans and nature that characterises the culture of its populations.

In seeking a model of sustainable development for these activities and for the organisation and development of the Island as a whole, it is crucial to recognise the importance of local traditions and culture as pillars of this development model, one that is based on the promotion of authenticity.

15.6.4. SPECIFY WHETHER ANY INDICATORS ARE USED TO EVALUATE THESE ACTIVITIES. IF YES, WHICH ONES AND GIVE DETAILS.

Assessment of the activities related to spiritual and cultural values will take into account the number of active organisations, their programmes and initiatives aimed at promoting local traditions and culture, and the number of participants in such activities.

16. LOGISTIC SUPPORT FUNCTION

16.1. RESEARCH AND MONITORING:

16.1.1. DESCRIBE EXISTING AND PLANNED RESEARCH PROGRAMMES AND PROJECTS AS WELL AS MONITORING ACTIVITIES AND THE AREA(S) IN WHICH THEY ARE (WILL BE) UNDERTAKEN IN ORDER TO ADDRESS SPECIFIC QUESTIONS RELATED TO BIOSPHERE RESERVE MANAGEMENT AND FOR THE IMPLEMENTATION OF THE MANAGEMENT PLAN (PLEASE REFER TO VARIABLES IN ANNEX I).

São Jorge Natural Park provides the scope and framework for the habitat and species conservation measures that are required to meet the objectives for conserving existing natural values and social and economic development.

With respect to expanding the Azores Hydro-Meteorological Network to all of the islands, two automatic stations will be installed this year on São Jorge; that is, a meteorological station and a udometric station.

To ensure that all equipment are functioning and the data provided by the system is reliable, the Government of the Azores' Regional Department of the Environment maintains a partnership with the Centre for Information and Monitoring on Volcano Seismicity in the Azores (CIVISA) at the University of the Azores, monitoring and analysing the conditions for data acquisition, transmission, reception and storage on a 24-hour basis.

After it is duly handled and modelled by CIVISA, the data generated by the network is used as base data for issuing and disseminating alerts on dangerous slope movement associated with precipitation, a process that also involves civil protection services.

Automation of the stations and the teletransmission of data in real time allows for timely knowledge of the hydrological cycle and a rigorous analysis of water availability, ensuring the protection of people and goods from extreme water systems events that result in flooding and landslides. By making data available online, they also allow any citizen to access up to date information for personal, professional or scientific purposes, thereby contributing towards participatory management and improved citizenship. As a result of all of the aforementioned facts and its innovative concept, the Azores Hydro-meteorological Network was awarded a prize under the category "Information Technology" in the Green Project Awards Portugal contest in 2013.

16.1.2. SUMMARIZE PAST RESEARCH AND MONITORING ACTIVITIES RELATED TO BIOSPHERE RESERVE MANAGEMENT (PLEASE REFER TO VARIABLES IN ANNEX I).

The following research and monitoring activities have been developed in the area within the proposed Biosphere Reserve, with special attention being paid to nature conservation and the sustainable management of resources and land:

- **1995-1997** – "Study of Azores's rare plants and natural habitats" project – Life B4 – 3200/94/764 – University of the Azores – Regional Directorate for the Environment.
- **1995-1998** – LIFE "Conservation of communities and habitats of Azores's marine birds", in the context of the LIFE Nature Programme, coordinated by the Oceanography and Fisheries Department of the University of the Azores in partnership with the Regional Directorate for the Environment, the University of Glasgow and the Royal Society for the Protection of Birds (RSPB). This research on the biology and ecology of marine birds in the Azores was useful for establishing priority conservation measures and monitoring the distribution and population trends of such birds.
- **1997-2000** – AMIR "Marine birds as indicators of the Azores's food web structure and resources" project, implemented by the Oceanic Institute of the Oceanography and Fisheries Department at the University of the Azores (IMAR). Research on the diet of *Calonectris borealis, Sterna hirundo and Sterna dougallii* in the SPA.
- **1997-2001** – LIFE 2b "Studies and conservation of the Azores' natural heritage" project (collaboration between the Regional Directorate for Forestry Resources and the University of the Azores and financed by the LIFE Programme of the European Community). This project was aimed at studying and actively conserving areas of high heritage value within the forest area perimeter of the Azores, which are under consideration for Natura 2000, the European network of protected areas.
- **1999-2002** – "New atlas of the birds nesting in Portugal" project, promoted by the Institute for the Conservation of Nature (ICN), the Portuguese Society for the Study of Birds (SPEA), Azores's Regional Directorate for the Environment and Madeira Natural Park.
- **2000-2006** – LITOSOST "Sustainable management of the social, economic and ecological development of the coastal areas of Macaronesia" project, coordinated by the Regional Secretariat for the Environment and the Sea, the Regional Department of Spatial Planning of the Autonomous Government of The Canary Islands and the Regional Secretariat of Transport and Social Infrastructure of the Autonomous Government of Madeira, in the context of the INTERREG IIIB programme. This was an initiative by the competent authorities within the Macaronesia Region. Its goal was to develop a system for coastal land management that would reduce urban and infrastructural pressure on coastal areas and encourage as their regeneration, rehabilitation and organisation for public use and benefit.

- **2001-2004** – OGAMP "Planning and management of protected marine areas" project, in the context of the INTERREG IIIB Programme (MAC/4.2/A2), coordinated by the Oceanography and Fisheries Department of the University of the Azores. Creation of proposals for management plans for Azores's coastal and marine areas within the Natura 2000 Network. The biotic, abiotic and socio-economic profiles of selected sites was conducted and an environmental awareness programme was developed according to the goals of the project.
- **2002** – "Characterisation of the most appropriate lands for the conservation of wild bird populations listed in Annex I of the Birds Directive in the Azores archipelago", coordinated by the Portuguese Society for the Study of Birds (SPEA), which resulted in changes to the mapping of the SPA Network.
- **2004-2007** – MARMAC "Knowledge, promotion and enrichment for the sustainable use of the marine protected areas of Macaronesia" project, in the context of the INTERREG IIIB Programme. Promotion of the coastal and marine environment of the Macaronesia region through coastal planning and improved management and knowledge of the biodiversity of the Azores archipelago and Canary Islands.
- **Since 2004** – CLIMAAT "Climate and meteorology of the Atlantic archipelagos" project, in the context of the INTERREG IIIB Programme (INTERREG IIIB – MAC/2.3/A3), coordinated by the Centre for Climate, Meteorology and Global Changes - University of the Azores. Implementation of a scientific cooperation project aimed at developing specific methodologies for the study of meteorology and climate in Atlantic island regions and their adjacent areas, as well as the collection, compilation and processing of relevant information on climate and its dissemination to the public.
- **2007-2009** – REMAx project – "Experimental network for marine education in the Azores", coordinated by the IMAR Centre at the University of the Azores and financed by the Regional Secretariat on the Environment and the Sea, aims to develop marine education initiatives and stimulate future cooperation between education providers and society. This project aims to create the Marine Education Network of the Azores.
- **2012** – TRACE project - maps the movements and habitat use of baleen whales and sperm whales in the North Atlantic at varying time and space scales to identify biologically and ecologically important areas for the conservation of these species.
- **2012** – Programme consisting of the photo-identification and acoustic recording of cetaceans.
- **2012** – Assessment of the risk to terrestrial birds in the Azores from exposure to haemosporidian parasites, especially avian malaria.
- **2012** – Research Project on the "Development and implementation of a monitoring programme for the collection of information and assessment of the conservation status of habitats listed in Annex I and species listed in Annexes II, IV and V of the Habitats Directive related to land areas".

Figure 111. Fajã da Caldeira de Santo Cristo Interpretation Centre

Figure 112. São Jorge Nature Park House and Eco-Museum

- **2012** – Study promoting general knowledge of the biology and ecology of *Grampus griseus*, assessing its importance for (potentially) resident populations in the context of a doctoral project and the research programme Risso Project, which has been developed by the Nova Atlantis Foundation since 2000.
- **2012-2013** – Development of techniques for the passive detection and localisation of cetaceans through acoustic means.
- **2012-2013** – Project on the "Conservation of Lactuca watsoniana Trelease, an Azorean priority species: phylogenetics, population genetics and propagation" - Collection of plant material for studies on phylogenetics, population genetics, population ecology and threats, as well as germination and vegetative propagation tests to develop conservation measures for the species on São Jorge Island.
- **2012-2014** – Research project on the effects of anthropogenic noise on the behaviour of cetaceans.
- **2012-2015** – MAPCET project - assessment of the covnservation status of cetaceans, providing necessary information on the dynamics and ecology of cetacean communities and the effects of human activities on the integrity of these communities.
- **2012-2015** – AZORPI project - Study to provide information on the ecology and taxonomic and conservation status of *Columba palumbus azorica;* Collection and transportation of remaining terrestrial birds and dead bats to other ongoing research projects.
- **2013** – Capture and handling of wild animals for ringing, collection of biometric data and blood samples from avifauna specimens as a follow-up to a study initiated in the context of the doctoral project "Biogeography and Evolution of Azorean Passerines – An Integrative and Comparative Approach".
- **2013-2015** – Collection of seeds for conservation at the Regional Germplasm Bank of Faial Botanical Gardens.
- **2014** – Study of the population dynamics of *Sterna hirundo* (Garajau-comum), *Sterna dougallii* (Garajau-rosado) and *Calonectris borealis* (Cagarro).
- **2014** – Study of the origin of plant biodiversity in the Azores and its colonisation by *Cardamine hirsuta*.

- **2014** – Study and promotion of bryophytes and ferns as bioindicators of climate change, in the context of "MOVECLIM: Montane vegetation as listening posts for climate change" project.
- **2014** – Production of maps depicting cetacean distribution in the Azores and knowledge on the ecology of the species, in the context of a doctoral project financed by the Regional Fund for Science, a follow up tostudies initiated by the MONICET research project.
- **2015** – Study of the distribution and phylogeny of the genus *Cladonia*, in the context of the "Coevolution of Cladoniaceae and associated fungi" project.
- **2015** – Capture and handling of wild birds for ringing and collection of blood and stool samples, in the context of the "Biogeography of coccidian, haemosporidian and avian pox in Macaronesian passerines" project.
- **2015** – Study of the diet, communication, population dynamics and productivity, and monitoring and counting of seabirds in colonies in the Azores.
- **2015** – Study of the evolutionary pattern of the species to understand the dispersal mechanisms and subsequent differentiation in the different islands, in the context of the "*Woodwardia radicans* phylogeography" project.
- **2015** – Study aimed at assessing the risk to terrestrial birds in the Azores from exposure to haemosporidian parasites, especially avian malaria.

16.1.3. INDICATE WHAT RESEARCH INFRASTRUCTURE IS AVAILABLE IN THE PROPOSED BIOSPHERE RESERVE, AND WHAT ROLE THE BIOSPHERE RESERVE WILL PLAY IN SUPPORTING SUCH INFRASTRUCTURE

The Fajã da Caldeira de Santo Cristo Interpretation Centre and São Jorge Park Centre and Eco-Museum provide information and promote the Biosphere Reserve to the general population and visitors.

16.2. EDUCATION FOR SUSTAINABLE DEVELOPMENT AND PUBLIC AWARENESS

16.2.1. EXISTING AND PLANNED ACTIVITIES

In terms of implementing the Regional Plan for Environmental Education and Awareness in the Azores (PRESAA), coordinated by São Jorge Natural Park, an array of actions and environmental education programmes have been, and will continue to be, developed in partnership with authorities, schools and environmental NGOs. These include:

- **Eco-Schools Programme** – a European initiative operated by the Foundation for Environmental Education, which aims to promote actions and recognise the work of schools in benefiting the environment. This programme involves the island's entire student community.
- **SOS Cagarro Campaign** – aims to encourage people to help save young Cory's Shearwaters. These campaigns are preceded by formal information sessions and/or informal contacts with potential partners. They involve the whole island and its population.
- **Parque Escolas Programme** – a regional initiative that seeks to provide resources and information to schools through actions based on a variety of themes, involving all schools on the island.
- **Parque Aberto Programme** – a regional initiative that promotes actions and activities in protected areas and/or environmental centres to encourage more participation from the whole population. This programme also promotes actions related to the island's cultural and traditional aspects.

The Government of the Azores is developing a programme on electrical mobility with the Nature Wardens Staff , which includes purchasing 14 vehicles for the Natural Parks of the Azores.

Due to the physical nature of our islands and some of the areas within Natural Parks, it will not be possible to replace the entire fleet with electric vehicles for environmental monitoring and policing. However, they are an excellent mobility solution in many situations and are a positive response to current problems such as global warming, air quality and fossil fuel dependency. With each electric vehicle that replaces a gasoline powered vehicle, we help reduce CO2 emissions annually by 2.5 tonnes and save on maintenance and supply costs.

The first vehicle from this programme was delivered to São Jorge Natural Park in April 2015.

16.2.2. WHAT FACILITIES AND FINANCIAL RESOURCES ARE (OR WILL BE) AVAILABLE FOR THESE ACTIVITIES?

These activities will be developed in a wide array of facilities, including the Fajã da Caldeira de Santo Cristo Interpretation Centre, the São Jorge Park Centre and Eco-Museum and the Francisco de Lacerda Museum, Elementary and Secondary Schools of Velas and Calheta, and the Vocational School of São Jorge Island.

These structures coordinate an array of environmental and cultural activities and each institution in charge of managing the respective activities is responsible for securing the financial and human resources needed for their development.

16.3. CONTRIBUTION TO THE WORLD NETWORK OF BIOSPHERE RESERVES

16.3.1. HOW WILL THE PROPOSED BIOSPHERE RESERVE CONTRIBUTE TO THE WORLD NETWORK OF BIOSPHERE RESERVES, ITS REGIONAL AND THEMATIC NETWORKS?

Since the beginning of its development, the Fajãs de São Jorge Biosphere Reserve has made local, regional, national and international cooperation a priority and has been an active partner in thematic and regional networks. For instance, it hosted and organised the 13th meeting of the REDBIOS Network in 2014 and participated in the Fifth Meeting of the World Network of Island and Coastal Biosphere Reserves. In August 2015, the Biosphere Reserve hosted an international seminar involving the participation of representatives of various biosphere reserves, National MAB Committees, the Portuguese National Commission for UNESCO and the secretariat of UNESCO's MAB Programme. Its aim was to encourage networking and the sharing of experiences and knowledge, and explore possibilities for collaborative work in the future.

16.3.2. WHAT ARE THE EXPECTED BENEFITS OF INTERNATIONAL COOPERATION FOR THE BIOSPHERE RESERVE?

International cooperation with other Biosphere Reserves will facilitate the sharing of experiences and promote the transfer of useful knowledge to solve concrete problems on São Jorge Island. This will strengthen the role of the proposed Biosphere Reserve as a laboratory of experiences for nature conservation and socio-economic development.

At the same time, it will allow the Fajãs de São Jorge Biosphere Reserve to promote local knowledge, products and services within the scope of Biosphere Reserve networks, thereby expanding their respective markets.

16.4. INTERNAL AND EXTERNAL COMMUNICATION CHANNELS AND MEDIA USED BY THE BIOSPHERE RESERVE

16.4.1. IS THERE A BIOSPHERE RESERVE WEBSITE?

The websites of the Azores Government[53] and SIARAM – Sentir e Interpretar o Ambiente dos Açores [Feel and Experience the Azores Environment], contain pages dedicated to the Biosphere Reserves of the Azores [54], where one can access information about the Biosphere Reserves of Corvo, Graciosa and Flores.

The website for Parques Naturais dos Açores[55] [The Natural Parks of Azores], which is currently being redeveloped, will include a specific page about the Biosphere Reserves of Azores.

Until the Fajãs de São Jorge Biosphere Reserve is designated and subsequently integrated into the aforementioned websites, information about conservation, sustainable development and environmental education in the proposed area is available on this page of the São Jorge Natural Park website[56].

16.4.2. IS THERE AN ELECTRONIC NEWSLETTER?

From the beginning of 2016 onwards, an e-newsletter will be produced, covering all Biosphere Reserves in the Azores.

Until then, news about the Biosphere Reserves of the Azores, including the application for the Fajãs de São Jorge Biosphere Reserve, will be provided in the e-newsletter of São Jorge Natural Park.

16.4.3. DOES THE BIOSPHERE RESERVE BELONG TO A SOCIAL NETWORK (FACEBOOK,TWITTER, ETC.)?

The Fajãs de São Jorge Biosphere Reserve plans to create a page on Facebook and use communication tools such as Twitter, Periscope, Instagram and others as part of its marketing and communications strategy.

53 http://www.azores.gov.pt/Gra/srrn-natureza/menus/secundario/Reservas+da+Biosfera/

54 http://siaram.azores.gov.pt/reservas-biosfera/_intro.html

55 http://parquesnaturais.azores.gov.pt/pt/

56 http://parquesnaturais.azores.gov.pt/pt/sjorge

17. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION

17.1. MANAGEMENT AND COORDINATION STRUCTURE

17.1.1. WHAT IS THE LEGAL STATUS OF THE BIOSPHERE RESERVE?

The Biosphere Reserves of the Azores Autonomous Region are within the legal framework of the Regional Network of Protected Areas under the terms defined in Articles 51 to 54 of Regional Legislative Decree no. 15/2012/A of 2 April. Each reserve is administered within the scope of the Natural Park of the Island on which it is located, which is responsible for providing the logistical and administrative support needed for its operation. However, the Biosphere Reserves have an autonomous management structure, namely a Management Committee headed by the Director of the São Jorge Natural Park, whose composition and competencies are set out in article 54 of Regional Legislative Decree no. 15/2012/A of 2 April.

As members of the Management Committee, stakeholders play an important role in the implementation and management of the Biosphere Reserve. This committee is responsible for: providing advice on the management plan and its implementation; overseeing management; promoting and authorising the use of the brand and the logos on products and services; and recommending actions and projects to develop and promote the objectives of the Biosphere Reserve.

17.1.2. WHAT IS THE LEGAL STATUS OF THE CORE AREA(S) AND THE BUFFER ZONE(S)?

The zoning that was defined for the proposed Biosphere Reserve took into account the natural, social, economic and cultural features of São Jorge Island, its main reference being the susceptibility of natural environments to human activity and its implications for the territory. As such, it took into consideration the legal mechanisms in force, namely the the protected areas that have been created and their respected conservation statuses, and regulations on the compatibility of uses and types of land use.

The core areas and buffer zones that have been defined are totally compatible with the borders of existing protected areas and areas covered by spatial planning and territorial management instruments.

The core areas are comprised of areas with protected status for nature and biodiversity conservation, which are totally compatible with the conservation function to which they have been ascribed. They comprise the protected areas of São Jorge Natural Park, which are classified under Regional Legislative Decree no. 10/2011/A of 28 March and meet the criteria adopted by the International Union for the Conservation of Nature (IUCN).

The buffer zones are comprised of areas with protected status for nature and biodiversity conservation or areas governed by a special spatial planning instrument, which are compatible with the complementary functions of the core areas. They comprise protected areas within São Jorge Natural Park, which are classified under Regional Legislative Decree no. 10/2011/A of 28 March and meet the criteria adopted by the International Union for the Conservation of Nature (IUCN), or zones within the area of intervention of the São Jorge Coastal Zone Management Plan (POOC), which was approved by Regional Regulatory Decree no. 24/2005/A of 26 October.

17.1.3. WHICH ADMINISTRATIVE AUTHORITIES HAVE COMPETENCE FOR EACH ZONE OF THE BIOSPHERE RESERVE (CORE AREA(S), BUFFER ZONE(S), TRANSITION AREA(S))?

The Biosphere Reserves of the Azores Autonomous Region are within the legal framework of the Regional Network of Protected Areas under the terms defined in Articles 51 to 54 of Regional Legislative Decree no. 15/2012/A of 2 April. Each reserve is administered within the scope of the Natural Park of the Island on which it is located.

The proposed Biosphere Reserve will have an autonomous management structure, namely a Management Committee headed by the director of the São Jorge Natural Park, whose composition is set out in Article 54, No. 1 of Regional Legislative Decree no. 15/2012/A of 2 April. The committee will be responsible for: providing advice on the management plan and its implementation; overseeing management; promoting and authorising the use of the brand and the logos on products and services; and recommending actions and projects to develop and promote the objectives of the Biosphere Reserve.

The Management Committee will normally meet at least once a semester The Management Committee will normally meet at least once a semester and whenever its president deems it necessary. As the management unit for the island's protected areas

network, São Jorge Natural Park will be responsible for providing the logistical and administrative support needed for the operation of the proposed Biosphere Reserve.

In terms of administrative authorities, the Management Committee will include representatives of the Azores Government and the Town Councils of Calheta and Velas.

Apart from the competencies exercised within the scope of the Management Committee, the Azores Government and the Town Councils will exercise various administrative powers in the area within the proposed Biosphere Reserve.

The Azores Government, through the department responsible for the environment and São Jorge Natural Park, will exercise its functions primarily in the management of the core areas and buffer zones.

Within the transition areas and beyond the borders of São Jorge Natural Park, the Town Councils of Velas and Calheta will be responsible for administration and licensing.

17.1.4. CLARIFY THE RESPECTIVE COMPETENCE OF EACH OF THESE AUTHORITIES

Apart from the competencies exercised within the scope of the Management Committee, the Azores Government and the Town Councils will exercise various powers in the area within the proposed Biosphere Reserve.

The Azores Government, through the department responsible for the environment and São Jorge Natural Park, will manage the core areas and buffer zones.

Within the transition areas and beyond the borders of São Jorge Natural Park, the Town Councils of Velas and Calheta will be responsible for administration and licensing.

17.1.5. INDICATE THE MAIN LAND TENURE (OWNERSHIP) FOR EACH ZONE

The right to private ownership of land is considered a fundamental right and as such, is guaranteed under the Constitution of the Portuguese Republic[57].

In line with Law no. 31/2014 of 30 May, establishing the general basis for Public Policies on Soils, Land Use and Urbanism, the right to private property and other rights associated with land use are contemplated and determined within the scope of the legal relationships between spatial planning and urbanism and constitutionally protected principles and values, namely in the areas of national defence, environment, culture and cultural heritage, landscape, public health, education, housing, quality of life and social and economic development.

57 Article 62 of the Constitution of the Portuguese Republic

17.1.6. IS THERE A SINGLE MANAGER/COORDINATOR OF THE BIOSPHERE RESERVE? WHO DESIGNATES AND EMPLOYS HIM/HER?

The proposed Biosphere Reserve will have an autonomous management structure, namely a Management Committee headed by the director of the São Jorge Natural Park, whose composition is set out in Article 54, No. 1 of Regional Legislative Decree no. 15/2012/A of 2 April. The committee will be responsible for: providing advice on the management plan and its implementation; overseeing management; promoting and authorising the use of the brand and the logos on products and services; and recommending actions and projects to develop and promote the objectives of the Biosphere Reserve.

17.1.7. ARE THERE CONSULTATIVE ADVISORY OR DECISION-MAKING BODIES FOR EACH ZONE OR FOR THE WHOLE BIOSPHERE RESERVE?

The Management Committee of the Biosphere Reserve, headed by the director of the São Jorge Natural Park, whose composition is set out in Article 54, No. 1 of Regional Legislative Decree no. 15/2012/A of 2 April, is responsible for: providing advice on the management plan and its implementation; overseeing management; promoting and authorising the use of the brand and the logos on products and services; and recommending actions and projects to develop and promote the objectives of the Biosphere Reserve.

17.1.8. HAS A COORDINATION STRUCTURE BEEN ESTABLISHED SPECIFICALLY FOR THE BIOSPHERE RESERVE?

The director of São Jorge Natural Park will be responsible for the coordination of the Biosphere Reserve, notwithstanding the powers exercised by the Azores Government and the Town Councils of Calheta and Velas regarding management of the land, enforcement and licensing.

17.1.9. HOW IS THE MANAGEMENT/COORDINATION ADAPTED TO THE LOCAL SITUATION?

The Action Plan for the Fajãs de São Jorge Biosphere Reserve may decide how management and coordination will be adapted to local specificities.

17.1.10. IS THERE A PROCEDURE FOR EVALUATING AND MONITORING THE EFFECTIVENESS OF THE MANAGEMENT?

Monitoring of evidence, with a view towards evaluating and monitoring the effectiveness of the management of the Fajãs de São Jorge Biosphere Reserve, will be carried out under the terms defined in the respective Action Plan.

17.2. CONFLICTS WITHIN THE BIOSPHERE RESERVE

17.2.1. DESCRIBE ANY IMPORTANT CONFLICTS REGARDING THE ACCESS OR THE USE OF NATURAL RESOURCES IN THE AREA CONSIDERED

We do not anticipate any conflicts in the Fajãs de São Jorge Biosphere Reserve.

We do, however, anticipate pressures associated with a growth in tourism, namely urban pressures; a growth in infrastructure for tourist accommodation; and the opening up of new access. These scenarios are envisioned in current planning instruments and legislation regarding authorisation, licensing and environmental impact assessments.

17.2.2. IF THERE ARE ANY CONFLICTS IN COMPETENCE AMONG THE DIFFERENT ADMINISTRATIVE AUTHORITIES IN THE MANAGEMENT OF THE BIOSPHERE RESERVE?

Given that the management structure of Azores' Biosphere Reserves and their respective competences are clearly defined in Articles 51 to 54 of Regional Legislative Decree no. 15/2012/A of 2 April, there are no conflicts in this regard nor do we foresee any conflicts in the future.

17.3. REPRESENTATION, PARTICIPATION AND CONSULTATION OF LOCAL COMMUNITIES

17.3.1. AT WHAT STAGES IN THE EXISTENCE OF A BIOSPHERE RESERVE HAVE LOCAL PEOPLE BEEN INVOLVED?

Local communities have participated and been involved in the application process for the Fajãs de São Jorge Biosphere Reserve since the very beginning when the proposal was first announced. This announcement was made at a public session held in September 2014 in the village of Velas on São Jorge as part of the 12th International Meeting of REDBIOS (East Atlantic Biosphere Reserve Network). This meeting was attended by representatives of other Biosphere Reserves belonging to REDBIOS and MAB committees.

From the beginning of the process, various contacts have been made with representatives of local, public and private institutions on different occasions to inform them of the MAB Programme and seek their collaboration on the Biosphere Reserve's proposal and creation. An informal monitoring group was created, involving the participation of local authorities (municipalities), organisations from the agricultural and fisheries sectors, private associations involved in environmental issues and the conservation of natural heritage, and individuals of recognised standing.

This group met several times over the course of the process and made a valuable contribution in preparing the application, including the Action Plan for the proposed Biosphere Reserve.

Public sessions were held during the month of June 2015, to present and analyse the zoning of the reserve, after which the application form was subject to public consultation, which took place over a period of 25 days between 22 July and 15 August 2015.

In the future, stakeholders will play a key role in the development of the Biosphere Reserve and its different areas, acting as the driving force behind its sustainable economic development.

The legal framework for the Biosphere Reserves of the Azores is set out in Articles 51 to 54 of Regional Legislative Decree no. 15/2012/A of 2 April, which guarantees stakeholders the right to public participation in all phases of their development.

Under the terms of the aforementioned legal framework, the Management Committee of the Fajãs de São Jorge Biosphere Reserve includes the director of the São Jorge Natural Park (who serves as the committee's head); the mayors of the Town Councils of Calheta and Velas; representatives of the Azores Government from the departments responsible for the economy, agriculture, forestry and fisheries; representatives of active business associations on the island; representatives of existing agricultural and fisheries associations on the island; representatives of environmental NGOs active on the island; and a representative of the Nature and Environmental Protection Section (SEPNA) of the Azores Territorial Command of the National Republican Guard (GNR). The Management Committee is responsible for providing advice on the management plan of the Biosphere Reserve and its implementation; overseeing the Biosphere Reserve's management; promoting and authorising the use of the Biosphere Reserve's brand and logos on products and services; and encouraging activities and projects to further and promote the objectives of the Biosphere Reserve.

17.3.2. DESCRIBE HOW THE LOCAL PEOPLE HAVE BEEN, AND/OR ARE REPRESENTED IN THE PLANNING AND MANAGEMENT OF THE BIOSPHERE RESERVE

The entire population of São Jorge participated freely and actively in the development of the Biosphere Reserve, whether it was as individuals or as organisations or associations. The technical team that developed the application and worked on the form counted on the participation of representatives from various sectors of civil society, as well as a public consultation period and various public events that involved widespread participation from civil society.

The legal framework for the Biosphere Reserves of the Azores is set out in Articles 51 to 54 of Regional Legislative Decree no. 15/2012/A of 2 April, which guarantees stakeholders the right to public participation in all phases of their development.

Under the terms of the aforementioned legal framework, the Management Committee of the Fajãs de São Jorge Biosphere Reserve includes the director of the São Jorge Natural Park (who serves as the committee's head); the mayors of the Town Councils of Calheta and Velas; representatives of the Azores Government from the departments responsible for the economy, agriculture, forestry and fisheries; representatives of active business associations on the island; representatives of existing agricultural and fisheries associations on the island; representatives of environmental NGOs active on the island; and a representative of the Nature and Environmental Protection Section (SEPNA) of the Azores Territorial Command of the National Republican Guard (GNR). The Management Committee is responsible for providing advice on the management plan of the Biosphere Reserve and its implementation; overseeing the Biosphere Reserve's management; promoting and authorising the use of the Biosphere Reserve's brand and logos on products and services; and encouraging activities and projects to further and promote the objectives of the Biosphere Reserve.

17.3.3. DESCRIBE THE SPECIFIC SITUATION OF YOUNG PEOPLE IN THE PROPOSED BIOSPHERE RESERVE

The Fajãs de São Jorge Biosphere Reserve aims to be a centre of excellence for involving young people in training and capacity building activities, as well as promoting programmes for young entrepreneurs geared towards job creation opportunities, in close collaboration with public agencies that are responsible for youth, other associations such as young farmers, environmental NGOs and others.

The Azores Government has established programmes to encourage entrepreneurialism and youth employment with the goal of creating opportunities to integrate young people into the job market. These include Estagiar U, T and L; PIIE (for those who have completed the Estagiar L level and can extend the internship for an additional year); CPE-Premium; Garantia Açores Jovem; Empreende Jovem; and Labjovem.

17.3.4. WHAT FORM DOES THIS REPRESENTATION TAKE?

In addition to what is set out in Article 53 of Regional Legislative Decree no. 15/2012/A of 2 April, the Action Plan for the Fajãs de São Jorge Biosphere Reserve will define how local communities, actors and stakeholders will be represented.

17.3.5. ARE THERE PROCEDURES FOR INTEGRATING THE REPRESENTATIVE BODY OF LOCAL COMMUNITIES?

Notwithstanding the procedures defined in the Action Plan for the Fajãs de São Jorge Biosphere Reserve, the legal framework of the Biosphere Reserves of the Azores, as set out in Articles 51 to 54 of Regional Legislative Decree no. 15/2012/A of 2 April, guarantees that the Management Committee of the Fajãs de São Biosphere Reserve will be comprised of the director of the São Jorge Natural Park (who will serves as the committee head); the mayors of the Town Councils of Calheta and Velas; representatives of the Azores Government from the departments responsible for the economy, agriculture, forestry and fisheries; representatives of active business associations on the island; representatives of existing agricultural and fisheries associations on the island; representatives of environmental NGOs active on the island; and a representative of the Nature and Environmental Protection Section (SEPNA) of the Azores Territorial Command of the National Republican Guard (GNR).

17.3.6. HOW LONG-LIVED ARE CONSULTATION MECHANISMS?

Notwithstanding the consultation mechanisms set out in the Action Plan for the Fajãs de São Jorge Biosphere Reserve, the legal framework of the Biosphere Reserves of the Azores, as set out in Articles 51 to 54 of Regional Legislative Decree no. 15/2012/A of 2 April, establishes that the Management Committee is responsible for providing advice on the management plan of the Biosphere Reserve and its implementation; overseeing the Biosphere Reserve's management; promoting and authorising the use of the Biosphere Reserve's brand and logos on products and services; and encouraging activities and projects to further and promote the objectives of the Biosphere Reserve.

17.3.7. WHAT CONSULTATION MECHANISMS HAVE BEEN USED, AND WHO HAS BEEN INVOLVED?

The process for preparing the application for the Fajãs de São Jorge Biosphere Reserve involved direct consultations with the local population, scientific community and non-governmental organisations, as well as public debates and a public consultation period to collect feedback on the application form.

Suggestions and opinions were taken into account in the preparation of the final proposal.

The team that prepared the application form also included technicians and representatives of various public institutions, non-governmental organisations and individuals of recognised standing.

17.3.8. DO WOMEN PARTICIPATE IN COMMUNITY ORGANIZATIONS AND DECISION-MAKING PROCESSES?

Article 13 of the Constitution of the Portuguese Republic enshrines the principle of equality, giving all citizens the same degree of dignity before the law. It states that no one can be privileged, benefited, harmed or deprived of any right or exempt from any duty on the basis of ancestry, sex, race, language, territory of origin, religion, political or ideological convictions, education, economic situation or sexual orientation.

The current legal regime guarantees full rights and equality between the sexes.

17.4. THE MANAGEMENT/COOPERATION PLAN AND POLICY

17.4.1. IS THERE A MANAGEMENT/COOPERATION PLAN/POLICY FOR THE BIOSPHERE RESERVE AS A WHOLE?

Laws and regulations and existing management plans will continue to be applied in the area within the proposed Biosphere Reserve.

The Fajãs de São Jorge Biosphere Reserve will also adopt a specific Action Plan under the terms of Article 52 of Regional Legislative Decree no. 15/2012/A of 2 April that will cover the entire area of the Biosphere Reserve and be in line with the regulations of the São Jorge Natural Park and other applicable legal and planning instruments.

17.4.2. WHICH ACTORS ARE INVOLVED IN PREPARING THE MANAGEMENT/COOPERATION PLAN?

The Action Plan was submitted to the stakeholders for feedback, as well as to the Management Committee for its opinion, under the terms of sub-paragraph a), No.2 in Article 54 of Regional Legislative Decree no. 15/2012/A of 2 April. The committee includes the director of the São Jorge Natural Park (who serves as its head); the mayors of the Town Councils of Calheta and Velas; representatives of the Azores Government from the departments responsible for the economy, agriculture, forestry and fisheries; representatives of active business associations on the island; representatives of existing agricultural and fisheries associations on the island; representatives of environmental NGOs active on the island; and a representative of the Nature and Environmental Protection Section (SEPNA) of the Azores Territorial Command of the National Republican Guard (GNR).

17.4.3. DO LOCAL AUTHORITIES FORMALLY ADOPT THE MANAGEMENT/COOPERATION PLAN?

The Action Plan for the Fajãs de São Jorge Biosphere Reserve will be approved by an ordinance from the Azores Government's minister of environment under the terms of Article 51, No. 3 of Regional Legislative Decree no. 15/2012/A of 2 April after it has been reviewed by the Management Committee.

The Action Plan will then be published in the Official Gazette of the Azores Autonomous Region (JORAA).

17.4.4. WHAT IS THE DURATION OF THE MANAGEMENT/COOPERATION PLAN?

The Action Plan for the Fajãs de São Jorge Biosphere Reserve will have a three-year duration under the terms of Article 51, No. 1 of Regional Legislative Decree no. 15/2012/A of 2 April, in which the Management Committee shall be responsible for overseeing its execution.

17.4.5. DESCRIBE THE CONTENTS OF THE MANAGEMENT/COOPERATION PLAN

The action plan was developed in accordance with local and regional strategies for sustainable development, nature conservation and the protection and promotion of heritage and culture, and took into consideration the Action Plan and Strategy of UNESCO's MAB Programme.

Under the terms of Article 51 of Regional Legislative Decree no. 15/2012/A of 2 April, the Action Plan must contain, beyond the measures and actions to be implemented:

- An environmental education programme specifically for residents of the Biosphere Reserve;
- Internal and external promotional campaigns to meet the objectives established for Biosphere Reserves within the framework of the UNESCO MAB Programme.

The Action Plan for the Fajãs de São Jorge Biosphere Reserve accompanies this application form.

17.4.6. INDICATE HOW THIS MANAGEMENT/COOPERATION ADDRESSES THE OBJECTIVES OF THE PROPOSED BIOSPHERE RESERVE

The Action Plan for the Fajãs de São Jorge Biosphere Reserve is guided by the fundamental objectives of conserving biodiversity, natural resources and landscapes; encouraging local and regional development by promoting a green economy and ensuring environmental training and education; and conducting research and transferring knowledge between various actors. The corresponding indicators of sustainable development will be constantly monitored.

17.4.7. IS THE PLAN BINDING? IS IT BASED ON A CONSENSUS?

The Action Plan for the Fajãs de São Jorge Biosphere Reserve is within the legal purview of Article 51 of Regional Legislative Decree no. 15/2012/A of 2 April. It was developed in accordance with the usual parameters of a sectoral programme following a process of consensus and active participation by all stakeholders.

17.4.8. WHICH AUTHORITIES ARE IN CHARGE OF THE IMPLEMENTATION OF THE PLAN, ESPECIALLY IN THE BUFFER ZONE(S) AND THE TRANSITION AREA(S)?

The management structure of the Fajãs de São Jorge Biosphere Reserve, as defined in Articles 51 to 54 of Regional Legislative Decree no. 15/2012/A of 2 April, is responsible for implementing the Action Plan in partnership with other public and private entities involved.

17.4.9. WHICH FACTORS IMPEDE OR HELP ITS IMPLEMENTATION?

A key factor in supporting its implementation is the fact that the Action Plan and the management structure of the Biosphere Reserves of the Azores have already been determined by legal provisions contained in Articles 51 to 54 of Regional Legislative Decree no. 15/2012/A of 2 April.

17.4.10. IS THE BIOSPHERE RESERVE INTEGRATED IN REGIONAL/NATIONAL STRATEGIES?

The Fajãs de São Jorge Biosphere Reserve application has been incorporated into the Azores Autonomous Region's strategies for sustainable development and cohesion.

The Azores Government has a vast array of incentives, programmes, policies and strategic documents that aim to develop, support and boost the region's economic, social, cultural and environmental sectors. They include the island of São Jorge and its specificities, both in terms of its socio-economic situation and its typical products, such as São Jorge cheese, canneries, handmade crafts and unique landscape.

These programmes include:

- Programme of the XI Azores Government;
- Medium Term Guidelines 2013-2016;
- Azores Operational Programme 2014-2020;
- POSEIMA (Programme of Options Specifically Relating to the Remoteness and Insularity of Madeira and the Azores);
- PRORURAL (Rural Development Programme for the Azores Autonomous Region);
- PROPESCAS (Operational Programme for Fisheries for the Azores Autonomous Region);
- PROEMPREGO (Operational Programme for Jobs for the Azores Autonomous Region);
- Azorean Agenda to Create Jobs and Business Competitiveness;
- Strategic Plan for Cohesion in the Azores;
- Strategic Plan to Promote Entrepreneurialism in the Azores Autonomous Region 2013-2016
- Regional Strategy on Climate Change

Programme of the XI Azores Government

The Programme of the XI Azores Government makes mention of the fact that, in addition to local actions aimed at preserving and restoring the quality of the landscape, the Azores currently possesses a number of international certifications that reflect the level of

quality it has reached. These certifications, including Biosphere Reserves, the Natura 2000 Network, the European Destinations of Excellence, QualityCoast and many others, are proof of what it has achieved. As such, the government needs to maintain, or when required, expand these types of certifications.

The Programme also mentions that among the environmental certifications that the Azores has earned, Biosphere Reserves, in particular, represent an enormous opportunity to increase the visibility of the Azores islands. Hence, included in the objective related to the coordination of the action plans for each island's Natural Park is a proposed measure aimed at ensuring that environmental certifications such as Biosphere Reserves, Natura 2000 Network, RAMSAR Sites and others are reflected in these action plans.

In addition, and with the aim of increasing the impact of environmental quality seals of approval, the Programme recommends expanding the use of the Biosphere Reserve label on regional products from designated islands.

Medium Term Guidelines 2013-2016

The Medium Term Guidelines 2013-2016 mention a number of international certifications that show the level of quality that the Azores has attained, such as the Natura 2000 Network and Biosphere Reserves. This will require the integration of different policies to uphold the Azores' image of environmental quality.

It recommends that from 2013 to 2016, the Regional Government's actions on the environment and planning be based on seven main pillars, namely nature conservation and environmental awareness; spatial planning; water resources; environmental quality and world heritage; waste management; requalification of the coastline; and monitoring, promotion, enforcement and action on the marine environment. In terms of nature conservation and environmental awareness, it highlights the management of the Azores' biodiversity and natural heritage.

Operational Programme "Regional Azores 2014-2020"

Worth highlighting in Priority Axis 6 of the Operational Programme "Regional Azores 2014-2020" (environment and effectiveness of resources), is Investment Priority 6.3 – the conservation, protection, promotion and development of natural and cultural heritage, which envisions the implementation of various interventions aimed at valuing and promoting sustainable tourism based on associated natural and cultural heritage. These include initiatives to raise awareness and promote the renewal/expansion of international environmental certifications, namely the Biosphere Reserves, the Azores Geopark, the European Destinations of Excellence, QualityCost, Blue Flag, "Praia Acessível" [Beaches for All] and the European Charter for Sustainable Tourism in Protected Areas.

Whilst the link between culture, tourism and the environment emerges naturally in the Azores, there is a need to articulate and coordinate actions. There should be clear and close collaboration between agents to allow for more lasting results and increased sustainability.

Also worth noting is Investment Priority 6.4 – protection and restoration of biodiversity and soils and the promotion of systems that provide ecological services, particularly through the Natural 2000 Network and green infrastructure. In a territory with the characteristics of the Azores Autonomous Region, the protection and promotion of biodiversity and natural resources is a strategic priority for its social, economic and environmental sustainability.

POSEIMA

The Programme of Options Relating to the Remoteness and Insularity of Madeira and the Azores is a specific supply regime to support local agricultural production, including the following measures: the production, transformation (especially private storage aid for "Island" and "São Jorge" cheeses) and commercialisation of animal and plant products.

PRORURAL

The Rural Development Programme for the Azores Autonomous Region is developed on four axes: boosting the competitiveness of the agriculture and forestry sectors; improving the environment and rural landscape; improving the quality of life in rural areas and diversifying the economy; and the Leader approach. Currently, PRORURAL+ for 2014-2020 is in operation.

PROPESCAS

The PROPESCAS programme aims to create the conditions for competitiveness and sustainability in the regional fisheries sector, taking into account the implementation of regimes for biological and ecologically sustainable exploitation; better organisation for harvesting, transformation and commercialisation; strengthening commercial productive activities; diversifying and providing more added value; and ensuring the quality of fishery products. The guidelines for the development of the Region's fisheries sector imply the inclusion of the following priority axes: Priority Axis 1 – adaptation of the regional fishing fleet; Priority Axis 2 – aquaculture and the transformation and commercialisation of fisheries products; Priority Axis 3 – general measures; and Priority Axis 4 – sustainable development of fishing zones.

PROEMPREGO

PRO-EMPREGO is structured around six domains of intervention: youth employability; strengthening conditions for employability in the private sector; modernising the productive fabric and supporting entrepreneurialism; employability and entrepreneurialism based on research and development; regional competitiveness in the information and knowledge society; and social inclusion through training, jobs and entrepreneurialism.

Azorean Agenda to Create Jobs and Business Competitiveness

The Azorean Agenda to Create Jobs and Business Competitiveness envisions various policies of incentives, which include:

- The creation of a new system of incentives to develop the craft industry. It aims to strengthen the quality of the production of craft enterprises in the Azores and address the structural changes resulting from the creation of a statutory regulation on artisans and craft production units, thereby strengthening the conditions for supporting the development of this economic sector;
- The creation of a system of incentives for external marketing and commercialisation, with the aim of strengthening the external competitiveness of regional products and increasing intraregional trade;
- Developing the distinction of the Azores Brand by linking the Region with a brand that is synonymous with quality and excellence and using it as a strategy for attracting and retaining markets. Azorean products, be they traditional, tradable goods such as dairy or tuna, or services such as tourism, should stand out from other competitors, seeing as they come from a Region whose ecological footprint has high environmental value;
- 50% reduction in the air cargo tariff and 77% reduction in the handling fee for fresh products produced in the Region (vegetables, fruits, eggs, dairy products – yoghurt and cottage cheese, among others) that originate from and are sent to the "Cohesion Islands" (São Jorge, Graciosa, Santa Maria, Flores and Corvo);
- Implementation of a training-action programme to encourage entrepreneurialism in local Azorean sectors and products, including fisheries and its derivatives, agro-industry associated with dairy products, tourism, other activities associated with the sea and renewable energy;
- The establishment of the project Terra-Açores, which involves the creation on different islands of a land granting system to provide publicly available land for young farmers. It encourages the creation of hotbeds for farming companies run by young people, thereby stimulating agricultural diversification in the region.
- The creation of the projects Agir Agricultura and Agir Industria, aimed at tackling unemployment and creating new jobs.

Strategic Plan for Cohesion in the Azores

The Azores Government has identified regional cohesion as one of the strategic factors of governance, an element for approximating and classifying the conditions offered on different islands in order to encourage people and families to stay, including validating local communities (social cohesion) and providing conditions for developing entrepreneurial activities that create wealth and employment (economic cohesion).

São Jorge, Graciosa, Santa Maria, Flores and Corvo were selected as "cohesion islands". In the case of São Jorge, the Strategic Plan for Cohesion in the Azores proposes a number of aspects to be considered in such a plan, including:

- Sustainable tourism, by articulating terrestrial and marine environmental resources, cultural wealth and the cheese economy as a fundamental pillar of the strategy, one founded on the creation of a proper certified brand, capacity building of the actors and organisations who assess and coordinate this sector, and the definition of an effective marketing and promotional dynamic. These are tasks that should, in essence, be implemented and coordinated by the Region.
- The cheese economy should be stabilised, professionalised, reorganised and improved, especially in terms of productive and organisational efficiency, protection of the brand and quality criteria, and better marketing and commercialisation.
- Due to its attractive features that favour documentary productions (on land and at sea), São Jorge could also be one of the islands to consider in attracting creative industries in the fields of audio-visual and multimedia production.
- The role of local institutions in the social economy as a cohesive factor in terms of meeting fundamental social needs, job creation and, more generally, fighting poverty and social exclusion.

Strategic Plan to Promote Entrepreneurialism in the Azores Autonomous Region 2013-2016

The Strategic Plan to Promote Entrepreneurialism in the Azores Autonomous Region includes the following proposals for action:

- START-UP AZORES - implementation of an international programme to attract qualified entrepreneurs;
- EMPREENDE AÇORES - implementation of a training-action programme to stimulate entrepreneurialism with respect to local products in the Azores;
- INCUBA AÇORES - creation of an incubator for leading-edge businesses in the Azores;
- BIC AZORES - creation of a Business Innovation Centre in the Azores;
- OBSERVATORY ON ENTREPRENEURIALISM - implementation of a facility to monitor the growth of entrepreneurialism in the Azores;
- AZORES ANGELS - creation of a network of Business Angels in the Azores;
- ENTERPRISE AZORES - implementation of a programme to raise the international profile of entrepreneurialism in the Azores.

Regional Strategy on Climate Change

Addressing the specificities and vulnerabilities of the Azores islands, various strategic sectors were identified in the implementation of the Regional Strategy for Climate Change (ERAC) for implementation, including: spatial planning and coastal zones; biodiversity and natural heritage; the marine environment and fisheries; agriculture and forests; and tourism and industry. ERAC will be implemented through a Regional Plan on Climate Change comprised of sectoral strategies that will include measures and actions considered relevant for each sector.

17.4.11. INDICATE THE MAIN SOURCE OF THE FUNDING AND THE ESTIMATED YEARLY BUDGET

The main sources of public funding for the Fajãs de São Jorge Biosphere Reserve are the budgets of the Azores Government and the Town Councils of Calheta and Velas.

Private investment will also need to be considered, partly co-funded by regional incentive schemes, such as PRORURAL+, Competir+, the Programme to Support Restaurants and Hotels in the Purchase of Regional Products, programmes to support craft-making, incentive schemes to restore and preserve traditional landscapes and the Programme to Support the Local and Coastal Fishing Fleet, among others.

In 2015, the Investment Plan of the Government of the Azores included disaggregated funding of 46.4 million Euros for São Jorge

17.5. CONCLUSIONS

17.5.1. IN YOUR OPINION, WHAT WILL ENSURE THAT BOTH THE FUNCTIONING OF THE BIOSPHERE RESERVE AND THE STRUCTURES IN PLACE WILL BE SATISFACTORY? EXPLAIN WHY AND HOW, ESPECIALLY REGARDING THE FULFILMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES (CONSERVATION, DEVELOPMENT, LOGISTIC SUPPORT) AND THE PARTICIPATION OF LOCAL COMMUNITIES

The Fajãs de São Jorge Biosphere Reserve aims to make a contribution towards improving the quality of life and economic development in the local community, based on the conservation of the island's biodiversity, landscape and cultural and historical identity. The Biosphere Reserve designation would bolster the efforts and commitment of government bodies and the local population to conserve species and ecosystems and promote a model of development that both preserves these natural values and uses them to create new opportunities for investment and job creation, thereby encouraging people to stay, especially youth and those who are the most qualified.

The proposed Biosphere Reserve would thus serve as a platform for development and public participation, promoting environmental training and information among economic agents and the general community. This would be supported by the knowledge created by research activities and by national and international cooperation with other Biosphere Reserves with whom we would work to explore new models for sustainable development and to find solutions for common problems.

18. SPECIAL DESIGNATIONS

	NAME
( )	**UNESCO WORLD HERITAGE SITE:**
(X)	**RAMSAR WETLAND CONVENTION SITE:** • São Jorge Central Plateau / Pico da Esperança (3PT027) • Fajã das Lagoas da fajã da Caldeira de Santo Cristo and Fajã dos Cubres de São Jorge (3PT015)
(X)	**OTHER INTERNATIONAL CONSERVATION CONVENTIONS/DIRECTIVES (SPECIFY):** • Natura 2000 Network – Ponta dos Rosais SAC (PTJOR0013) • Natura 2000 Network – Costa Nordeste and Ponta do Topo SAC (PTJOR0014) • Natura 2000 Network – Topo Islet and Adjacent Coast SPA (PTZPE0028)
(X)	**OTHER REGIONAL CONSERVATION CONVENTIONS/DIRECTIVES (SPECIFY):** • Reserve Area for the Management of Catches in Ponta dos Rosais. • Reserve Area for the Management of Catches in Morro das Velas; • Reserve Area for the Management of Catches in Fajã dos Cubres / Fajã da Caldeira de Santo Cristo • Reserve Area for the Management of Catches in Ponta do Topo
( )	**LONG TERM MONITORING SITE (SPECIFY):**
( )	**LONG TERM ECOLOGICAL RESEARCH (LTER SITE):**
(X)	**OTHER (SPECIFY):** • São Jorge Natural Park • Azores Geopark • Important Bird and Biodiversity Area (IBA)

19. SUPPORTING DOCUMENTS
(to be submitted with the nomination form)

1 LOCATION AND ZONATION MAP WITH COORDINATES

A map with coordinates showing the location and precise borders of the three zones in the Fajãs de São Jorge Biosphere Reserve is included in the annex of this nomination form, as well as the shapefiles (WGS 84 projection system) used to produce the map.

This map is accessible online at this link: http://arcg.is/1LdK0DM

2 VEGETATION MAP OR LAND COVER MAP

The vegetation map and land use/cover map of the Fajãs de São Jorge Biosphere Reserve is contained in the annex of this nomination form.

3 LIST OF LEGAL DOCUMENTS

A list of the main legal texts and normative acts authorising the creation and regulation of the use and management of the Fajãs de São Jorge Biosphere Reserve, as well as copies of these documents, is included in the annex of this form.

4 LIST OF LAND USE AND MANAGEMENT/COOPERATION PLANS

A list of land use and management plans for the Fajãs de São Jorge Biosphere Reserve is contained in the annex of this form.

Also annexed are copies of these instruments, with the summaries of each plan contained in point 9.3 of this form.

5 SPECIES LIST (TO BE ANNEXED)

A list of the main species that occur in the Fajãs de São Jorge Biosphere Reserve is contained in the annex of this form.

6 LIST OF MAIN BIBLIOGRAPHIC REFERENCES (TO BE ANNEXED)

A list of the main bibliographic references pertaining to the Fajãs de São Jorge Biosphere Reserve is contained in the annex of this form.

7 ORIGINAL ENDORSEMENT LETTERS ACCORDING TO PARAGRAPH 5

The official letters of support for the nomination of the Fajãs de São Jorge Biosphere Reserve are contained in the annex of this form.

8 FURTHER SUPPORTING DOCUMENTS

The project of the Action Plan of the Fajãs de São Jorge Biosphere Reserve and a DVD copy of a documentary produced by Paulo Henrique Silva to promote and support the nomination are included in the annex of this form.

20. ADDRESSES

20.1. CONTACT ADDRESS OF THE PROPOSED BIOSPHERE RESERVE

Name	REGIONAL DEPARTMENT OF THE ENVIRONMENT
Street or P.O. Box	Rua Consul Dabney, Colónia Alemã, Apartado 140
City with Postal Code	9900-014 Horta, Faial
Country	Portugal (Autonomous Region of the Azores)
Telephone	(+351) 292 207 300
E-mail	info.dra@azores.gov.pt
Website	http://www.azores.gov.pt/Portal/pt/entidades/sraa-dra/

20.2. ADMINISTERING ENTITY OF THE CORE AREAS:

20.3. ADMINISTERING ENTITY OF THE BUFFER ZONES:

20.4. ADMINISTERING ENTITY OF THE TRANSITION AREAS:

Name	SÃO JORGE NATURAL PARK
Street or P.O. Box	Rua Nova, Relvinha
City with Postal Code	9850-042 Calheta de São Jorge
Country	Portugal (Autonomous Region of the Azores)
Telephone	(+351) 295 403 860
E-mail	parque.natural.sjorge@azores.gov.pt
Website	http://parquesnaturais.azores.gov.pt/pt/sjorge

FAJÃS DE SÃO JORGE

CANDIDATURA A RESERVA BIOSFERA

The elongated shape of São Jorge island, from the Ponta dos Rosais to Topo, looked like a blue ship, steam trailing behind it.
The hazy, spine-like mountain ridges of São Jorge, the mother of thousands of cows that seemed destined to bellow in pain for her, and thousands of calves buried in her fiery bosom, still untouched by the gourmand's knife.
Down below, what they call the Old Tower and what was once the church's outbuilding – remnants of human presence engulfed by lava in the great eruption of 1808.
The vegetation, however, was beginning to win the duel that had been waged for more than a century between those blackened embers and the hidden forces beneath the ground, and the archil lichen, the pine, the pokeweed that colours cheeses and skirts alike, the waxy little flowers and the luscious berries of the sweet incense all embellished the desperate solitude of the place with leaves and birds.
Along the rivulets running from a grotto sprouted large leaves of velvety algae-green, the kind of plants that no one glances at twice in a botanical garden or the private grounds of a house on the mainland – where they are actually a curiosity. But on the islands they thrive in the humid aid, their mealy tubers – yams – thickening in the basaltic earth. Their abundance on São Jorge (...) gave rise to the nickname used by the inhabitants of the other islands for the people of this pastoral isle: Jorgenses are known as "yam-eaters".
At that time, in that carriage, as those mares borrowed in extremis from an unknown family wound up the steep sides of the cliffs, the Fajã das Almas seemed to mournfully coil against the sea.
The day broke with glimmers of sunlight on the old houses and pastures, which seemed bathed with milk in the blinding light: the damp mountain slopes, the Old Tower and the priest's house, buried in the lava from the eruption; the scattered white houses of Urzelina above the bare vineyards of Casteletes; and, finally, the rock with the cave beneath it, echoing with the sound of the tamed tide.

Excerpts from "Mau Tempo no Canal" [Storm in the Channel],
a novel by the Azorean writer Vitorino Nemésio

Governo dos Açores

ambiente açores

biosfera AÇORES

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UNESCO