Paulo Oliveira
Dília Menezes

Birds of the Archipelago of Madeira

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Apoio

FEOGA - ORIENTAÇÃO

Birds of the Archipelago of Madeira

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This book is dedicated to Eng. Henrique Costa Neves
The man who wrote the first page of the history of Nature Conservation in the Archipelago of Madeira. Our deep gratitude to the one who taught us that truly, "the only way to go is forwards" and that "chance protects the bold".

Thanks

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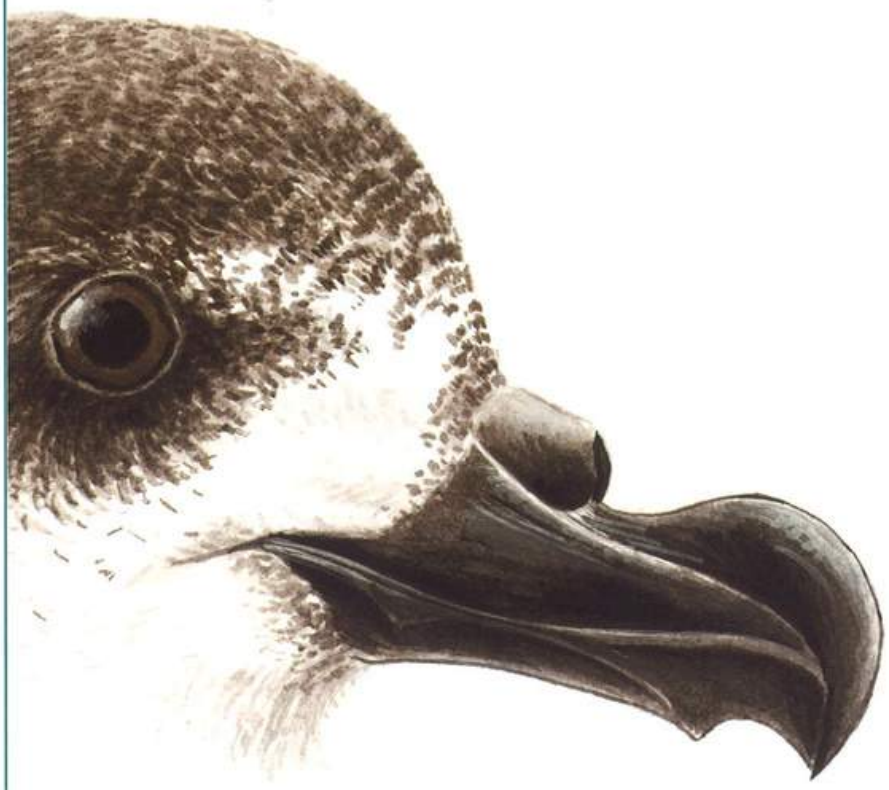
Birds of the Archipelago of Madeira



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Ocotea foetens - Bay Tree

Foreword

I would like to thank the authors of this excellent work and express the feeling that I am honoured by their invitation to write some brief comments.

It is my modest opinion that this book constitutes a notable work on the bird fauna of the Archipelago of Madeira and of Macaronesia and that it will enrich our knowledge of the territory's Natural History, while divulging it not only for the scientific community, but also and especially, for the avid layman who is receptive to the pulsation of the living world that surrounds him, with which he interacts and should coexist pacifically.

The beauty of the birds' colours, graciousness of their flight, their beautiful song we enjoy and the fascination that Man has always had for them, constitute an inexhaustible source of inspiration.

These birds perform a vital role in maintaining a balance between the diverse Ecosystems. Their preservation has become imperious using all of the existing lawful mechanisms and fundamentally, through awareness raising and engaging the population's youth in the great adventure of Nature conservation and the area's Biodiversity.

Congratulations are therefore in order, to all those people who contributed to the publication of this study which is evidence of, among other important aspects, arduous field work, serious and competent research with very rich scientific and informative contents and an added advantage of being written in a way that will be readily perceptible to the layman, generally characteristically uncommon in this type book.

I am sure that this work will enjoy the success it is worthy of.

Finally, I would like to express my high regard for the authors, for revealing their wisdom, humility and scientific maturity, the true characteristics of a good researcher and for dedicating "their" book to a great enthusiast of Nature conservation in the Archipelago of Madeira, Eng. Henrique Costa Neves and his highly meritorious work. I am also grateful for being associated with the authors and congratulate them on their work as a team in the aim of conserving Madeira's Natural Heritage.

Rúben A. Capela
(Retired Dean of the University of Madeira)

Birds of the Archipelago of Madeira

Introduction: Of what value are birds?

The true value of birds and their contribution to the well-being of Man is a matter that is generally underestimated, although today there is a collective consciousness somewhat ingrained in our societies that wild animals, including birds, obviously, play an extremely important role in the ecological balance that sustains Life on the Earth.

Besides the ecological aspects normally associated with birds, such as their role as seed disperser's or their contribution to the control of plagues of insects and rodents, there are a variety of aspects of a social, economic and cultural nature in which birds take on a discreet, but irreplaceable role that is rarely thought about. It is perfectly legitimate to affirm that birds are present in all the areas that contribute to the good of mankind.

In the satisfaction of the most basic needs of food and clothing, this role is clearly and perfectly known all around the world. Birds contribute to the feeding of man, whether directly through providing meat and eggs, or indirectly through providing fertilizers in the form of guano, for example. Their feathers are also used for the most diverse purposes, especially in the field of clothing. These aspects obviously confer a very high economic importance to birds.

Furthermore, the study of birds has contributed over the years to the advancement of varied and distinct areas of science. Even during the pre-historic era of aviation, Leonardo da Vinci was inspired by birds to design the first sketches of flying machines. More recently, the Galapagos finches made a decisive contribution to the development of Darwin's revolutionary theory of evolution. Thus, we can say that the development of studies on the biology, ecology and behaviour of birds made a decisive contribution to the increased awareness of the world that surrounds us.

In many cultures, birds are associated with religious worship and with the healthy occupation of free time, in this way fulfilling an important role in the spiritual and mental well-being of man. This is illustrated by the countless persons who dedicate themselves to the raising of birds or the thousands of birdwatchers that exist to some degree all around the world, but who are a special tradition in the United Kingdom.

From the first contacts with the world that surrounds us, birds hold a place in our imagination: the eagle is the symbol of force and determination; the white dove is the symbol of peace; the swallows announce the arrival of spring, and therefore, of happier and more pleasant times; the owl is the messenger of misfortunes, while the stork is supposed to bring babies.

We believe that, after all that has been presented, it is right to ask if there could be a world without birds. The answer is obvious: No!

Vision, Objectives and Methodology

The fundamental objective of this publication is to divulge an important part of the Natural Heritage of the Archipelago of Madeira. Presented here are previously unpublished data and detailed information on **all the birds that regularly breed** in this Archipelago, reviewing and examining more thoroughly the information found in the book A Conservação e Gestão das Aves do Arquipélago da Madeira, published by the Serviço do Parque Natural da Madeira in 1999.

This new compilation of information became pertinent due to the fact that in the last few years important groundwork projects appeared with the objective of improving the knowledge base on the fundamental parameters for the management of species of wild birds, namely their numbers, distribution, and the type of habitats they use. **It is a book designed for ornithologists, students, naturalists or anyone with the least interest in the avifauna of the Archipelagos of Macaronesia.**

The list of species examined here takes into account only those that nested here in at least five of the last ten years. Thus, 38 species were considered to be regular breeders. Some species included in the 1999 publication, such as the Turtle dove Streptopelia turtur, the Little ringed plover Charadrius dubius, the Roseate tern Sterna dougalli and the Sooty tern Sterna fuscata, are not included here. On the other hand, the Moorhen Gallinula chloropus is included, precisely due to the fact that in the last few years it has been confirmed to nest here.

The basic information presented is the result of broad field work, which took place during the nesting seasons, February to July, from 1999 to 2002. 90 transects were made, lasting two hours, along a georeferenced grid (UTM) of 2 km x 2km. These areas of study were distributed throughout the Island of Madeira and Porto Santo, covering in a proportional and representative manner, the totality of the existing habitats. Visits were also made to the Ilhas Desertas and the Selvagens.

These transects were designed to: (i) record all the bird species found in the area, (ii) identify their habitats and (iii) evaluate their state of conservation. Besides the authors, other observers were involved, who are mentioned in the frontispiece of this book.

During this same period, some groups and/or species, such as the marine birds, the Madeira laurel pigeon Columba trocaz and the Barn owl Tyto alba, were the subjects of specific methodology and/or projects put into operation by various teams. Whenever a team is distinct from the reference on the frontispiece, it is mentioned in the respective dossier of the species.

Last, but not least, it is also the objective of this book to divulge a small part of the work of a man who dedicated his life to nature conservation through his brush: Alfredo da Conceição.

Structure and Organisation

This book is divided into two distinct parts. The first is a section of an introductory nature, in which explanations are given for the factors that, on the one hand, give the birds of the Archipelago of Madeira their importance, and on the other hand, make them vulnerable. In this part, the different existing legal instruments are also presented, as well as the principal habitats of ornithological importance that exist in the Archipelago.

The second part seeks to summarise all the information that in some way is pertinent to the conservation and management of the species that regularly nest in the Archipelago of Madeira. Thus, for each bird considered, a type file was produced, which lists the distribution and number of individuals, types of habitats used, and their conservation status. Each file is also accompanied by a distribution map, which was produced, based on the specific field work or, in special cases, other available information.

Echium candicans - Massaroco

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The Importance and Vulnerability of The Birds of Madeira

In order to understand the real importance of the birds of the Archipelago of Madeira, one must go back in time, back to the time when this group of islands had its origin.

Islands with the characteristics of Madeira, Porto Santo, Desertas and Selvagens, which never were linked to any continent, are known as oceanic islands. Obviously, when these are formed, they have no type of animal or plants, having a vast number of possibilities for colonisation to be explored.

Living organisms have to overcome an immense barrier, the sea, to arrive at these islands. This is possible, due to the dispersion mechanisms, passive or active, found both in plants and in animals. Many plants developed dispersal strategies that allow them to colonise extremely remote islands. Examples to be pointed out include floating seeds that are resistant to salt water or miniscule seeds that are carried by the wind.

As for animals, the dispersal may also be passive, e.g., small animals that are carried on driftwood, or active, in which the dispersial is achieved by their own means. One of the principal candidates for such an achievement is, naturally, the birds that inhabit the mainland, or portion of land that lies the closest. In this way, the more remote an island is, the lower will be the number of species that reach it. Besides this, of the species that do arrive, due to a number of factors, only a part of them will survive and become established. This means that island environments have a smaller number of species, that is, their specific richness is lower than that of mainland areas of similar size and characteristics.

Furthermore, the survivors, after a period of becoming established, find conditions that are quite different from those they had in the homeland of origin, beginning what could really be called a "new life". Survival leads to adaptation, which in turn, together with the isolation and genetic drift, produces the phenomenon of speciation, that is, the appearance of a new species. There is, then, a qualitative enrichment of this fauna, whose interest and importance surpasses by far the poverty of species. An actual example of this is that of the species of endemic pigeons that can be found in Macaronesia, one in Madeira and two in the Canary Islands. This case is not unique. Mention can be made of the Bullfinch in the Azores and the Raso Lark in Cape Verde, for example.

The role of the islands in the speciation phenomenon is also illustrated by the proportion of subspecies that can be found in them, for species with a vast continental distribution, such as the Chaffinch. This bird, which is found almost continuously throughout Europe, from Portugal to the borders of the ex-Soviet Union (Hagemeijer & Blair 1997), has more than 40% of its subspecies in the Atlantic islands. This number is even more overwhelming if we remember that these islands represent much less than 1% of the bird's total area of occurrence.

At the same time, there is also the phenomenon of adaptive radiation, which also contributes to the diversification and enrichment of the island communities (Grant 1998, Whitaker 1998). When a bird arrives at an island, it finds a simplified ecosystem where many of the ecological niches are empty. There are no habitual or other competitors, nor are there any predators. In this way, the individuals multiply with greater ease and begin to occupy new niches, so as to diminish the intra-specific competition, among other factors. In time, various species can be formed, originating from one coloniser. As a classic example of this phenomenon we have the Galapagos Finches. When Darwin arrived at this archipelago, he found 14 species of Finches that probably originated from the same colonising species. On another scale, this phenomenon can be seen in the Canaries, where there are an endemic species and three endemic subspecies of Chaffinches, probably all of which have the same origin.

With so many "advantages", it would seem that these species had found paradise. However, due to the action of man, this is not the way it really is. These birds evolved in settings free of competitors and predators, and they lose their agressiveness and ability to defend themselves. Here we have the classic example of the birds whose wings atrophied and they could no longer fly, the extinct Dodo being a sad representative. Note that it is not only defence in the immediate sense of reacting to an agressor, but also it means defence in the sense of a survival strategy. For example, an evolutionary tendency found in birds in the islands is the lower number of eggs they lay. In the absence of inter-specific competition and of competitors, there are greater guarantees that smaller clutches will provide the same number of descendents. In this way, the continuity of the species is ensured with a minimum expenditure of energy. This phenomenon can be seen in the endemic Pigeons of Macaronesia. Any of the three species found in this region lay a single egg, while the Woodpigeon Columba palumbus, their common ancestor (Goodwin 1985), produces clutches with two eggs. Obviously this one has a greater capacity to face the adversities imposed by other species, whether competitors, predators or man.

In this way the species of the islands are extremely vulnerable to changes in their environment, that is, they are extremely vulnerable to man and his actions. Man destroys vast areas of natural habitats, which in insular environments are already small. Man introduces herbivores that destroy the plants and degrade the existing habitats. Man introduces every sort of predator, the main ones being rats, cats, and dogs. Man alters the existing balance by exterminating some species and favouring the proliferation of others. Man introduces competitors from continental areas, which are therefore more agressive in nature. Man corrupts the rules of the game and turns paradise into a burial ground!

This vulnerability is evident in the fact that 90% of the birds that became extinct in the last century were found in islands (Mountfort 1988). If we add to this the fact that islands have a proportionately lower number of species, these values become even more significant.

Everything mentioned here is not a theory of biogeography, nor of the conservation of birds in islands. It is the reality of what is happening around us. When we look at a Chaffinc in Madeira, we are seeing Natural History in action, because Madeira is no different from the Galapagos or any other island. There is something that unites all the islands of the planet, which is the fact that they are capable of producing new species that are unique and extremely vulnerable. The best and saddest proof of this is the fact that, following the arrival of man, Madeira Island has already experienced the disappearance of a pigeon that was an endemic subspecies, Columba palumbus madeirensis.

It is precisely this that constitutes the importance of the avifauna of the Archipelago of Madeira, as well as that of the neighbouring Archipelagos of Macaronesia. The role that these islands play in the conservation of the species of vulnerable birds, unique in the entire world, is evident in the fact that two Endemic Bird Areas (EBA) have been identified for this region of the Atlantic. One of these takes in the Archipelagos of Madeira and the Canaries, which includes six endemisms, and the other is related to Cape Verde, where there are four (Stattersfield 1998).

In the Archipelago of Madeira, out of a total of 38 regular breeding birds, there are two species and six endemic subspecies. Besides this there are four species and 11 subspecies endemic to Macaronesia. Without a doubt, this natural heritage contributes to the world biodiversity and it is important that we conserve it.

Legislation and Nature Reserves of Ornithological Interest

Protection of the environment in general, and avifauna in particular, in the Archipelago of Madeira comes from two sides: The application of national and international legislation for the protection of species and wild habitats and the existence of a network of Protected Areas.

Legislation

Today, the legal provisions with the highest levels of efficiency are those imposed by Community regulations. In the Community, the first great action for the conservation of the natural heritage took place in 1979 with the publication of Directive n.º 79/409/CEE, on the conservation of Wild Birds (Birds Directive). This law was designed to protect, manage and control the species of birds that live in the wild within the territory of the European Union. Due to the regression of many populations of bird species in the European territory and the increasing degradation of their habitats, the directive provided for the creation of Special Protection Areas (SPA's) that correspond to the habitats whose safeguarding is a priority for the conservation of the bird populations. In Madeira, four SPA's have been established: the Laurel forest, the Eastern Mountainous Massif, the Ilhas Desertas, and the Ilhas Selvagens.

It was later, in 1993, that one of the greatest acts of Community law in the field of nature conservation came into being: Directive n.º 93/43/CEE, regarding the conservation of the natural habitats and of the wild flora and fauna (Habitat Directive). This law seeks to conserve the biodiversity through the creation of a set of Sites of Community Interest (SCI), among others. Six years after their designation, the SCI's will be transformed into Special Areas of Conservation (SAC's).

Thus, in terms of Community law, the regulations regarding the conservation of nature in the member states, as is the case of Portugal, is based on the Bird and Habitat Directives. These Directives are complementary in scope and have substantially identical objectives. They served as the substance for the Community instrument for conservation par excellence: Natura 2000 Network. In Madeira, 11 areas have been designated as sites of the Natura 2000 Network (for detailed information see the list of recommended sites).

In terms of Portuguese law, the Bird and Habitat Directives were transcribed through Decree-Law n.º140/99, of 24 April. This legislation has not yet been adapted to the Autonomous Region of Madeira.

Another important legal instrument for the conservation of wild life and its natural habitats in Europe, especially for endangered or vulnerable species, including migratory species, is the Bern Convention. The provisions of this convention are transcribed into Portuguese Law through Decree-Law nº 316/89.

There is yet another instrument for conservation which is less formal and fundamentally designed to provide guidelines: the IBA's - Important Bird Areas. The IBA's are areas designated according to objective criteria by an international non-governmental organisation, Birdlife International, which seeks, among other things, to sound the alert so that these areas may be included in official statutes for national and/or international legal protection. Eight IBA's have been set up in Madeira (For more detailed information, see Costa *et al.* (2003) and the appendix with the list of recommended sites).

SPA's, IBA's and Protected Areas of ornithological interest

Besides the instruments of legal protection, described in the previous section, the principal habitats for the birds are included in areas of Nature Reserves, under the jurisdiction of the Madeira Nature Park Service (SPNM). This Service has the jurisdiction over a vast area that extends from the Island of Madeira, where at least 1/5 of the Island has been declared a Strict or Partial Nature Reserve, to the Ilhas Desertas and the Selvagens. Four SPA's have been designated in the Region, all of them coinciding exactly with reserve areas. On the Island of Madeira there is also the Ecological Park of Funchal, which is under the managment of the city government.

Madeira Nature Park

The Madeira Nature Park is a Protected Area under the jurisdiction of the Madeira Nature Park Service. This Protected Area (hereafter called MNP) takes in 2/3 of the total area of the island. At the moment, the zoning distribution is being reviewed, and it is foreseen that areas with a lower level of protection will be decreased, while those with the highest levels of protection will be increased.

From the point of view of the bird fauna, as well as that of botany, the Laurel forest and the Eastern Mountainous Massif are very important, and therefore these areas of Nature Reserve, Strict and Partial, are also classified as SPA's. The Laurel forest is a practically continuous growth that covers approximately 22,000 ha of actual area (Neves *et al.* 1996), while the Eastern Mountainous Massif has an area of around 4,000 ha.

The Nature Reserve of Ponta de S. Lourenço is part of the Madeira Nature Park and is another area of great ornithological interest. Located at the easternmost tip of the Island of Madeira, this area is a nature heritage with very peculiar and interesting features. The vegetation found here is representative of the indigenous vegetation of the littoral zone of the island, and besides birds, the fauna is especially marked by terrestrial gastropodes. According to some authors, these represent the greatest exponent of the natural heritage of the island (L. Lace and M. Jones pers. com.). Ponta de S. Lourenço has been an IBA since 2003.

The Ilhas Desertas Nature Reserve

Ilhas Desertas, with a total area of approximately 1421 ha, are made up of Ilhéu Chão, Deserta Grande and Bugio, lying about 22 miles southeast of the city of Funchal. They are uninhabited and, together with Mauritania, represent the last Atlantic refuge for the Monk Seal Monachus monachus. The presence of these marine mammals was the catalyst for the creation of the Ilhas Desertas Protection Area in 1990, which later became the Ilhas Desertas Nature Reserve. Despite this fact, the richness of the marine avifauna that breeds there is justification in itself for the creation of this Reserve. The Desertas are one of the mos important breeding areas for seabirds of Macaronesia and the entire North Atlantic.

The marine part of this Nature Reserve has two distinct zones, one a Strict Reserve and the other a Partial Reserve, where professional fishing is permitted. The entire land area is classified as a Strict Nature Reserve.

On Deserta Grande, there is an observation and permanent guard post, whose operation is ensured by the Nature Watchmen Corps (CVN) of the Madeira Nature Park Services. The Ilhas Desertas are classified as SPA and IBA.

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The Ilhas Selvagens Nature Reserve

The Selvagens are made up of Selvagem Grande, Selvagem Pequena and Ilhéu de Fora. They lie about 160 miles south of the Island of Madeira and form the southernmost point of the national territory.

The Ilhas Selvagens Nature Reserve was created in 1971, being one of the oldest Nature Reserves in Portugal. At the moment, it is the only one that has been awarded the European Council's European Diploma of Protected Areas. The Ilhas Selvagens are further classified as SPA and IBA.

This Reserve is fundamentally ornithological in nature, and like the Desertas, they are one of the most important nesting areas for the seabirds of Macaronesia and the entire North Atlantic. Its creation resulted from the need to halt the intense human exploitation of some of the birds found there, especially the Cory's shearwater *Calonectris diomedea*.

The management of this Reserve is the responsibility of the Madeira Nature Park Services. It also has land and sea components that are Strict Nature Reserves, and obviously the access is limited and controlled. The Selvagem Grande has had a permanent watchman since 1976, a service presently guaranteed by members of the CVN.

Islets of Porto Santo

These islets have not yet been classified as Nature Reserves, but because they are an integral part of the Natura 2000 Network it is likely that this could happen in the near future. The effective protection of these areas and their extremely important botanical and ornithological features will make a decisive contribution to their conservation. From the point of view of the bird fauna, special attention will be given to the protection of various species of seabirds, of which the Cory's shearwater is a good example. The Islets of Porto Santo have been designated as IBA.

Western Porto Santo

This area extends to the west and north of Pico da Ana Ferreira and Pico das Flores and takes in a portion of the west coast of Porto Santo. Recently classified as IBA, this zone has widely differing habitats, sheltering representative populations of Little lack swift *Apus unicolor*, Madeira spectacled warbler *Sylvia conspicillata*, Hoopoe *Upupa epops*, Common tern *Sterna hirundo* and the Cory's shearwater *Calonectris diomedea*.

Ponta do Pargo

Located at the extreme western end of the Island of Madeira, this zone has also been classified as IBA. It brings together a series of distinct habitats, and it is an important location, due to the diversity of birds it shelters. The areas of the cliffs are important for the nesting of sea birds, while the agricultural and forested areas have a very high density of birds of prey and varied species of passeriforms. This IBA has no statute of legal protection at all.

Funchal Ecological Park

This property belongs to the Funchal City Hall, and it has its own management team. Although it is basically aimed toward environmental education, the Funchal Ecological Park has a strategy for managing the birds found within its area of jurisdiction, which will certainly produce important results in their conservation.

Isoplexis sceptrum - Isoplexis

Habitats Found in the Archipelago

Simply put, the habitat of a species is defined as an area capable of providing the ideal conditions for the survival of that species. Some species remain tied to a certain habitat throughout the entire yearly cycle, where they carried out their daily activities; other species migrate over greater or lesser distances, occupying areas with greatly differing characteristics throughout the year.

The Archipelago of Madeira, despite its small size, has a relatively varied set of natural, semi-natural and humanised habitats. Furthermore, there are many areas used by migratory species for nesting purposes and are therefore occupied only during part of the year.

Of Madeira Island's total area, only 20% to 30% is covered by indigenous vegetation, which occurs basically on the cliffs and in the valleys of inaccessible mountain areas and at Ponta de São Lourenço. A large part of the remaining area has been humanised and is used for human activities, such as agriculture or to accommodate infrastructures of a social nature. The habitats of Porto Santo, Ilhas Desertas and Selvagem Grande have also been greatly altered and degraded by human activity, including the introduction of exotic species. Recent projects for the restoration of the habitats of Deserta Grande and Selvagem Grande resulted in the creation of the conditions for their recuperation (Bell 2000, Menezes *et al.* 2004). The Ilhas Selvagens include two small insular spaces that remain unaltered: the Selvagem Pequena and the Ilhéu de Fora.

Gardens and urban green areas

The urban and suburban centres of the Island of Madeira, including the areas with higher habitational density such as Funchal, have many green areas, in the form of gardens or otherwise. These many spaces, which are found scattered a little bit everywhere, are extremely fragmented but make a decisive contribution to the maintenance of a great number of species. Naturally, their presence takes on greater importance as one moves in the direction of the mountains. In the upper areas of Funchal, we can still find large estates, which naturally are very important to the conservation of the avifauna. They are habitats used by birds such as the Blackcap *Sylvia atricapilla* and the Blackbird *Turdus merula*.

Rural dwellings with agriculture

The terrain of Madeira is a factor that strongly conditions agricultural activity on the Island. This activity is basically carried out on small terraces, with a high degree of subsistence agriculture. Even the farm lands used for commercial purposes are relatively small, and there are no large areas used for the intensive cultivation of a single crop.

The only exception, that is, the only crop that still has the proportions of monoculture is the banana. However, even considering this case that has its greatest expression on the south side of the island, agriculture is carried out on plots that are widely separated, with large areas of uncultivated land between them. In this way, agriculture is of such a nature that it is not incompatible with the conservation of avifauna, as is the case in many areas of the European continent. They are habitats par excellence for the Canary *Serinus canaria*, the Madeira Goldfinch *Carduelis carduelis* and the Linnet *Carduelis cannabina*.

Coastal vegetation

Madeira's littoral zone embraces an important plant community that extends upwards to 300m on the south side and to 100 m on the north. It is characterised by predominantly creeping species, where the bushes rarely reach more than a metre in height (Neves and Valente 1992). Among the species found here, the Pride of Madeira *Echium nervosum* and the Fish - stunning spurge Euphorbia piscatoria are worthy of special mention.

This type of vegetation is found in significant quantities at Ponta de S. Lourenço, the easternmost tip of Madeira Island, where we find the Rock sparrow *Petronia petronia*.

Exotic forests

The cultivated forest is dominated by the Pine *Pinus pinaste*r, Eucalytus Eucaliptus sp., Acacia Acacia sp, and Chestnut *Castanea sativa*, among other less common ones. These areas do not extend above 1200 metres in altitude or below the upper limit of the farmed areas, and are found more frequently on the more accessible slopes on the south side of the island. From the avifauna point of view, they are habitats that offer relatively limited conditions. These limitations are overcome once again by the fragmentation of some of the areas, which contributes to a greater floral diversity of these forested areas.

Laurel forest

This is the indigenous forest of Madeira Island, and it is considered to be a living fossil. Before the colonisation of the island, it covered nearly all the island with its exuberant vegetation. Today, it is reduced to about 22,000 ha of actual area, but even so, it is the largest and best preserved area of Macaronesian forest (Neves *et al.* 1996). It is a well-developed forest, having all the characteristic elements of this type of formation. In the different strata we find a great variety of species, but it is at the level of its herbaceous stratum that the greater part of the endemisms are found.

In the aboreal stratum, the most abundant trees are the Bay tree *Laurus azorica*, followed by the Bay *Ocotea foetens* and the Wax myrtle *Myrica faya*. However, from the point of view of dominance, that is, in terms of the area covered by the tree tops of each species, the most important parameter from the viewpoint of avifauna, the Til is the dominant tree, followed by the Bay tree and the Wax myrtle (Neves *et al.* 1996). In this habitat is found the Madeira laurel pigeon *Columba trocaz*, the only land endemism of avifauna in Madeira.

Heath forest

This fringe of vegetation is basically found on the upper limit of the laurissilva forest, making the transition to the high altitude vegetation, where it is also present. It is characterised by a very dense vegetation of relatively small size, made up of three species *Erica scoparia*, *Erica arborea* and in the highest zones *Erica madeirensis*. Normally associated with these species is another endemic species of Madeira: Madeira blueberry *Vaccinium padifolium*. This vegetation plays a fundamental ecological role in that it captures the water in the fog carried by the trade winds. This is the preferred habitat of the Madeira firecrest *Regulus ignicapillus*.

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High mountains

The highest peaks of Madeira are characterised by the presence of steep slopes, partially covered by a vegetation of great scientific interest. There are also many endemic species here, adapted to the conditions of strong winds and low temperatures that occur over the greater part of the months of the year. The vegetation is herbaceous or tall bushes, standing out among which are the rare Madeira juniper *Juniperus oxycedrus*, the Heath Erica sp., the Plantago *Plantago malato-belizi*, the Armeria *Armeria madeirensis*, the Madeira saxifrage *Saxifraga madeirensis* and the Madeira violet *Viola paradoxa*. Quite apart from the scientific importance of this vegetation is its very important role in impeding the erosion of the soil in these areas.

From the point of view of bird fauna, the orographic features of the zone take on greater importance, making it possible for different groups of birds to breed here. A notable case is the threatened endemic species Madeira's petrel *Pterodroma madeira*.

Coastal cliffs, small islands and islets

The coastline of the Island of Madeira is characterised by its steep cliffs, which conditions the use of these areas for construction and/or any other type of establishment of human infrastructures. Thus, a little bit all around the island, and especially on the slopes facing the north, there are large stretches of coastline that are potential breeding grounds for species belonging to different groups, especially birds of prey and seabirds.

The existence of small islands and various islets is of special importance for the breeding of a great number of marine birds. The most important of these are the Ilhas Desertas, the Ilhas Selvagens and the islets of Porto Santo.

Coastal marine zones and the high sea

Without a doubt, this habitat shelters one of the most important portions of Madeira avifauna. The location of the Archipelago of Madeira and the great distance between it and any continent make this habitat extremely important for the pelagic birds that seek out this group of islands for breeding grounds.

The littoral of the various islands that make up the Archipelago of Madeira is very rugged, dropping off rapidly to great depths. Thus, with the exception of the Island of Porto Santo, the coastal areas do not have the ideal conditions for the proliferation of species that are normally associated with this type of coastal habitat.

Dunes, beaches, and sandy plateau

This is probably one of the habitats occupying the least amount of area, but it is still used by very important species. This type of habitat can only be found in Porto Santo, where it occupies the entire southern littoral, Selvagem Pequena, Ilhéu de Fora and in some areas of the sandy plateaus of Selvagem Grande. On these last two islands, there is an extremely important nesting habitat for the White faced storm petrel *Pelagodroma marina*. The habitat for the Kentish plover *Charadrius alexandrinus* is found on Porto Santo.

For each species, a brief description of the important aspects related to its conservation is given. The information for all species is presented in the same format to facilitate access to it.

Assessment is made only for those species for which there is evidence of breeding in five of the last ten years.

Interpretation of each species account

Scientific name (Name of the first researcher to describe the species)
Taxonomic status - Portuguese Red Data Book category (Madeira)

World Distribution

Refers to the world distribution of the species, with information about the breeding status throughout the Macaronesian Archipelagos. The nomenclature and distribution of the species follows Hagemeijer & Blair (1997), Martin & Lorenzo (2001) and Bannerman & Bannerman (1963, 1965, 1968).

Identification

Refers to some of the obvious characteristics for recognition in the field. Since this is not meant to be a field guide, the description is not detailed; for this purpose refer to Câmara (1997).

Habitat

Concerns the main types of habitats where the species occurs.

Conservation

Distribution in the Archipelago, population size and trend

Refers to the distribution of the species throughout the area of occurrence in the Madeira Archipelago. When there is lack of precise figures, population size will be referred to within the following ranges: 1- 50, 51 - 250, 251 - 1000, 1001 - 2500, 2501 - 10000 and > 10001. The population trends indicates whether the population is increasing (positive), decreasing (negative) or stable.

Threats

The main threats, historical and current, affecting the species are referred to here.

Red Data Book category

The conservation status is assessed based upon the criteria set by IUCN, and in accordance with what is established in the Portuguese Red Data Book (www.icn.pt). The categories under consideration are the following: Least Concern, Vulnerable, Endangered, Critically Endangered (see Annexe I for definitions and www.iucn.org for details).

Legal Status

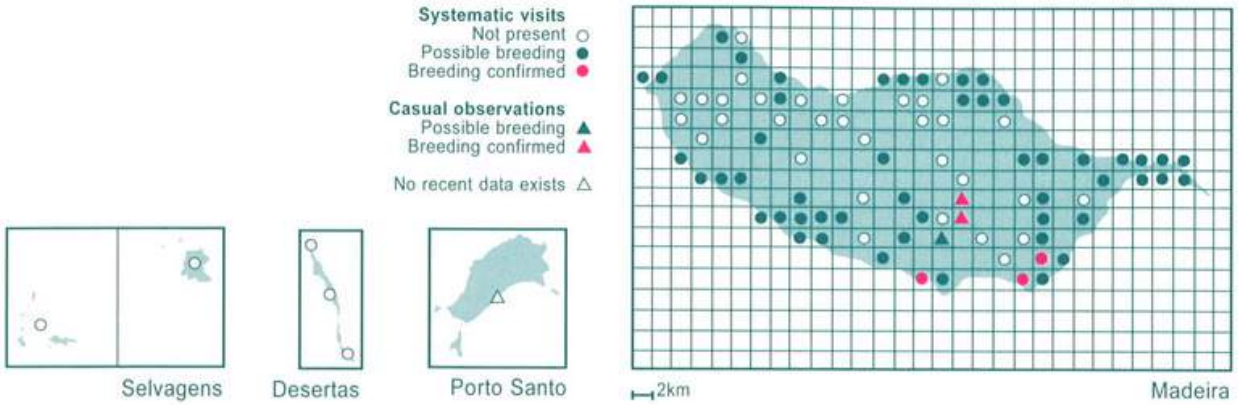
- Refers to the inclusion (or not) in the Annexes of the Birds Directive and/ or Bern Convention.
- Estimate of the area of occurrence of the species included in the Natura Network 2000 under the status of SPA or SCI, according to the following range: 0 - 20%, 21 - 50%, 51 - 80%, 81 - 100%.
- Protected Areas that include a representative extension of the occurrence/breeding area of the species.

Conservation Measures

The major conservation initiatives adopted to protect the species and/or their habitats are discussed here. When there is no plan of action for the species, we will discuss the need to create one.

Remarks

Refers to important notes/comments which are of relevance for a better understanding of the species conservation.



The maps show the distribution of each species, based upon the surveys carried out between 1999 and 2001 (more details in section "Objectives and Methodology"). When data is adapted from another source, there is reference to that source.

For each species there are the following indications: (grey) sites where systematic monitoring took place, (red) sites where there is the likelihood of the breeding of the species, and (orange) where the breeding has been confirmed. For those species which are not so common, there is information on their presence and/or their breeding. This data is the result of casual findings by several observers who are referred to in the frontespice.

Systematic visit

A systematic visit is one in which an area was visited with the specific aim of detecting the presence of a species, in accordance with what is outlined in the section *Vision, Objectives and Methodology*. In cases where the work was carried out by other authors whose names do not appear in the frontispiece of this book and/or whenever a specific methodology was applied, namely in the case of the seabirds, the Moorhen or the Owl, the author/work in question is duly referenced.

○ **Not present**
The species was not sighted during the visit.

● **Possible Breeding**
The species was sighted in a location where breeding is possible.

● **Breeding confirmed**
Evidence of breeding was found (nest, an adult carrying food, etc.).

Casual Observations

A casual sighting is one that is registered outside a programmed transection, such as during a leisure activity, for example.

▲ **Possible Breeding**
The species was sighted in a location where breeding is possible.

▲ **Breeding confirmed**
Evidence of breeding was found (nest, an adult carrying food, etc.).

△ **Map without grid, with white triangle**
There have been no recent surveys, nor casual sightings that allow us to define the distribution of the species with any rigour.

Map with grid and without symbols
Due to the improbability of the presence of the species, no systematic survey was carried out, nor were any casual sightings registered.

Madeira's petrel

Pterodroma madeira (Mathews 1934)

Endemic species to Madeira Island - Endangered

World Distribution

A species endemic to the Madeira Island.

Identification

At sea it is distinguishable from other species that occur on the Archipelago, with the exception of the *P.feae*, by the clear **V** shape drawn by its wings when in flight, by the contrast between the dark upper side and the white underside, and by the dark under wings.

Habitat

A pelagic bird, which breeds in a very restricted mountainous area of the island of Madeira, above 1600m. Nests are located in burrows in well vegetated inaccessible ledges (Zino *et al.* 2000). In 2003 a new colony was found in an area dominated by gramineous plants. This type of vegetation is completely different from that existing in the areas for their previously known breeding habitats (Menezes & Oliveira 2003).

Conservation

Distribution in the Archipelago, population size and trend

It is restricted to Madeira Island, where it breeds in a small area in the high mountains of the Central Massif. In 2003 a new breeding colony was found with at least 20 active nests (five of which are of individuals in their pre-reproductive period). In the areas already known, new nests were also found, which means that there is a trend towards an increase of the population, now estimated to be between 60 and 75 breeding pairs (in 2003 there were 45 active nests).

Threats

The factors that historically have contributed to the present population status were: predation of eggs and juveniles by introduced animals, namely rats and cats; degradation of the breeding habitat by herbivores, such as goats, sheep and rabbits; and human predation and disturbance. Collectors and the potential disturbance caused by ecotourism are two other aspects to be taken into consideration.

Red Data Book category

Endangered (EN)
Criteria: The species has a small population (fewer than 250 adult individuals).

Legal Status

- Annexe I of the Birds directive and Annexe II of the Bern Convention.
- 100% of the breeding area is classified as SPA and SCI, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

Since the 90's a very important conservation project is in the field with the objective of monitoring population size and controlling mammalian predators around the breeding ledges. In 2001, with financial support from the EC Life-nature programme, such measures were successfully extended and reinforced. Following the mentioned project, conditions were created to recover the habitats within the breeding sites of the Madeira's Petrel. One very important measure was the removal of all grazing stock from the area in 2002 (Menezes & Oliveira 2002, 2003). Furthermore, the site in question is under permanent surveillance, and night visits are subject to previous authorisation.

Remarks

The Madeira's Petrel is one of the rarest seabirds in the whole world and it was even considered extinct until the end of the 60s. It was rediscovered thanks to the joint effort of a group of people, among them João Gouveia, a retired forest warden, who was a key figure in the process.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △

Bugio's Petrel

Pterodroma feae (Mathews 1934)

Endemic species to Macaronesia - Vulnerable

World Distribution

A species endemic to Macaronesia. It breeds on the Archipelago of Madeira as well as in the Archipelago of Cape Verde, specifically in São Nicolau, Santiago, Fogo and S. Antão, where most of the population is to be found (Ratclife *et al.* 2000).

Identification

Refer to description of Madeira's Petrel.

Habitat

A pelagic sea bird which digs its nests on the ground, hence the reason why areas unaffected by erosion are believed to be of vital importance to its survival. Occasionally it can breed in crevices in the rocks or in areas with loose stones. This is alleged to be the habitat favoured by the population of Cape Verde.

Conservation

Distribution in the Archipelago, population size and trend

It breeds on two plateaus at Bugio, one of the three islands of the Desertas. It is likely that the population was once larger, spreading over the Islands of Madeira, Deserta Grande and Porto Santo (Pieper 1985). The size of the population is estimated to be between 173 and 258 breeding pairs (Geraldes 2000), with a trend towards stability.

Threats

A recent survey identified as the main threat and restricting factor the degradation of the habitat and the disturbance of the breeding birds caused by introduced goats and rabbits (Geraldes 2002). That same work draws the attention to the fact, that the increase in the population of Cory's shearwater on the Desertas Islands might give rise to competition for breeding burrows, which, in the long term, is likely to become a hindrance to the species.

Red Data Book category

Vulnerable
Criteria: Species with a small population (under 1000 adult individuals) with a small area of occupancy (under 20 sq. km) in one single location.

Legal Status

- Annexe I of the Birds directive and Annexe II of the Bern Convention.
- 100% of the breeding area is classified as SPA and SCI, integrating the Natura 2000 Network.
- Nature Reserve of the Desertas Islands.

Conservation Measures

Due to the difficult access to the plateau of Bugio, the species is protected by nature. After the identification and assessment of the full extent of the potential threats and restricting factors, the possibility of eradicating or controlling the rabbits on the island is now under close study. On the other hand, also under consideration is the possibility of moving some juvenile birds, in their first year, to the Deserta Grande, from where the mentioned herbivorous were eradicated and where the habitat is in full recovery.

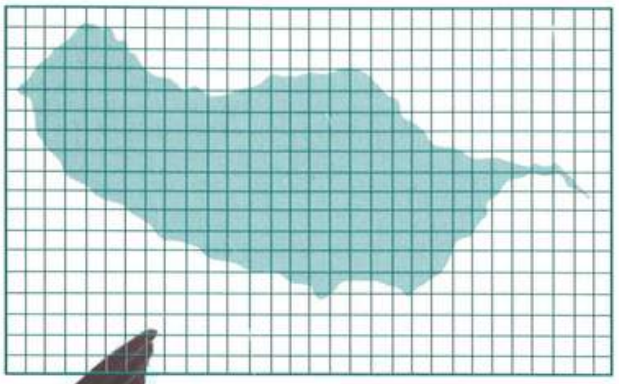
Remarks

Based on biometric data, it is strongly believed that the population of Cape Verde is of an entirely different species. Considering the obvious conservationist implications, it is worthwhile to study this matter further.
On the other hand, it is important to define management measures which will make the existence of the Bugio Goat compatible with the vulnerability of the habitat of this bird. The reason is that, these herbivores, apart from their taxonomic status, are considered to be a conservation units that have to be preserved in-situ.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Bulwer's petrel

Bulweria bulwerii (Jardine & Selby 1828)
Widespread distribution - Least concern

World Distribution

It is distributed along the tropical and temperate areas of the Atlantic and Pacific. In Macaronesia it breeds in the Archipelagos of Madeira, Cape Verde, the Canaries and the Azores.

Identification

In flight it can be identified by its dark colour, by the span of the wings in proportion to the body and because of its pointed wing tips.

Habitat

It is a pelagic sea bird which breeds on small islands, islets and on ocean cliffs. The nests may be built in crevices on the rocks, in underground burrows or under big stones (Nunes 1994).

Conservation

Distribution in the Archipelago, population size and trend

It occurs on all the islands, but mostly on the Desertas and Selvagens Islands. There is no reliable population count data; however, the actual population is believed to be well over 10000 individuals. On the Desertas and Selvagens the population trends is positive, whereas there is no data on the population of Madeira and Porto Santo.

Threats

In historical terms it is a bird affected by predation, human disturbance and degradation of the habitat throughout the whole Archipelago. In Madeira and Porto Santo predation by introduced animals, like the rat and the cat, is likely to be the limiting factor. On the Desertas predation by the Sea-gull is intense, nevertheless, judging from the population trends it is deemed not very relevant. As to the Selvagens the recent eradication of mice is likely to result in a population increase in the long term.

Red Data Book category

Least concern.
Criteria: population higher than 10000 individuals with a vast area of occurrence and occupancy.

Legal Status

- Annexe I of the Birds Directive and Annexe II of the Bern Convention.
- >80% of its breeding area is classified as SPA and SCI, integrating the Natura 2000 Network.
- Nature Reserves of the Desertas, Selvagens Islands and PNM.

Conservation Measures

The main colonies are classified as Strict Nature Reserve, thus, on the whole, its protection is adequate. A vital step towards its preservation is the permanent surveillance of the Nature Reserves of the Desertas and Selvagens. On the Islands of Madeira and Porto Santo further research is needed in order to understand its distribution and to enable the evaluation of the main limiting factors and henceforth the adoption of adequate management measures.

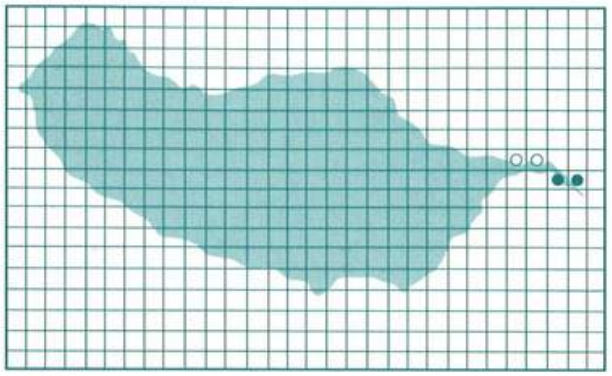
Remarks

The Deserta Grande shelters the largest colony of Bulwer's Petrel in the Atlantic and probably in the World. For this reason, this island has a relevant role in the preservation of the species.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Cory´s shearwater

Calonectris diomedea borealis (Cory 1881)

Widespread distribution

World Distribution

European distribution, except for the colonies of Cape Verde, Algiers and Tunisia. Three subspecies have been identified, and the one which occurs in the Archipelago of Madeira, the *C.d.borealis*, can also be found on the mainland of Portugal, and in the Archipelagos of the Canaries and the Azores. In the Mediterranean there is the nominal species, whereas the *C.d.edwarsi* can be seen in Cape Verde.

Identification

It is the seabird with the most imposing bearing of any species in the Archipelago and can be easily identified by its swift and gliding flight.

Habitat

A pelagic seabird which breeds on small islands, islets and coastal cliffs. The nests may be built in cavities on the rocks and under large stones. On the Selvagens, due to the nonexistence of disturbances and predators, it also breeds under dense bushes.

Conservation

Distribution in the Archipelago, population size and trend

It occurs throughout the Archipelago, with a population estimated to be at least 40000 individuals: between 2200 to 3800 on the Island of Madeira (Geraldes 2000), over 38000 on the Selvagens Islands (Mougin & Mougin 2000). There is no reliable population estimates for the actual population of the Desertas and Porto Santo, but it is thought to be well over 3000 and 1000 individuals, respectively. Even though there is no data on the population trend in Madeira and Porto Santo, it is believed to be negative, whereas on the Selvagens and Desertas it is definitely positive.

Threats

In historical terms it is a bird affected by human predation, which led to a dramatic decline in terms of population size. This threat still persists in Madeira and Porto Santo where cats and rats are another potential threat.

Red Data Book category

Least concern.
Criteria: Population higher than 10000 pairs with a vast area of occurrence and occupancy.

Legal Status

- Annexe I of the Birds Directive and Annexe II of the Bern Convention.
- 50 to 80% of its breeding area is classified as SPA and SCI, integrating the Natura 2000 Network.
- Nature Reserves of the Desertas, Selvagens Islands and PNM.

Conservation Measures

While the protection in place on the Desertas and Selvagens, where there is permanent surveillance, is considered adequate, in Madeira and Porto Santo it is non-existent. Much more needs to be done in order to determine its distribution, so as to enable the evaluation of limiting factors and thereafter, the introduction of adequate management policies.

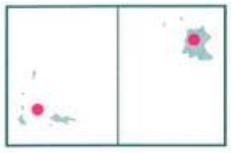
Remarks

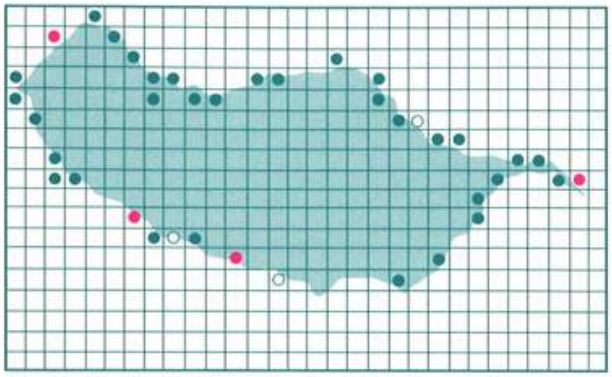
The exploitation of the Cory's shearwater reached alarming rates on the Selvagens in the 60s. Data from the last century refers to the capture of 20 to 22000 juveniles per annum (Jouanin & Roux 1966). As the number of larger, long-range fishing boats increased, restrictions on the activity had to be enforced leading to the foundation of the Nature Reserve of the Selvagens Islands, and it became one of the first Protected Areas in Portugal.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Manx shearwater

Puffinus puffinus puffinus (Brunnich 1764)

Widespread distribution - Vulnerable

World Distribution

Distribution extends over Iceland, the Faroe Islands, United Kingdom, France and the Macaronesian Archipelagos (Hagemeir & Blair 1977). The subspecies of the European Atlantic area type, the *P.p.puffinus* occurs in the Archipelagos of Madeira, the Canaries and the Azores. These Archipelagos represent, respectively, the southern and the western limits of its distribution. The subspecies *P.p.mauretanicus* is known to breed on the Balearic Isles and the *P.p.yelkouan* on the eastern Mediterranean areas.

Identification

At sea it might be mistaken for the Little Shearwater *P.assimilis*. What distinguishes these two birds is the black plumage on the head of the Manx shearwater which extends below the eye, whereas the plumage around the eyes of the Little Shearwater is white.

Habitat

A pelagic seabird known to breed in deep valleys, spreading well inland, away from the coast, usually where there is vegetation. Its nests can be found in very high elevations, and recently a colony was reported above 1,200m. (F. Viveiros com. pess.).

Conservation

Distribution in the Archipelago, population size and trend

Data on breeding has only been confirmed for Madeira Island, where it is dispersed over the many valleys of the island (Geraldes 2000, Santos 2001). Based on population count in rafts throughout the island, and on the intensity and distribution of vocalisation in some valleys under scrutiny (Oliveira and Câmara unpublished data, Geraldes 2000, Santos 2001), the population was estimated to be between 2,500 and 10,000 individuals. The number of rafts monitored to the south of the island has been declining in the last few years, leading to the conclusion that the population trend is negative (D. Câmara com. pess.).

Threats

In Madeira predation by introduced animals, namely rats and cats, is seen as the main threat for the species at present (Câmara 1997). In historical terms it is likely that other threats, such as the degradation and loss of the habitat, and capture by man, were also factors, leading, as a result to the vanishing of the species from more accessible sites (Oliveira 1999).

Red Data Book category

Vulnerable
Criteria: A species that can be seen in a restricted number of sites..

Legal Status

- Annexe II of Bern Convention.
- 50 to 80% of the breeding area is classified as SPA and SCI, integrating Natura 2000 Network.
- PNM.

Conservation Measures

A wide area of its breeding habitat is under PNM jurisdiction (Santos 2001). Nevertheless, the largest documented colony can be seen at Ribeira de Sta. Luzia, which comes under the Ecological Park of Funchal. Efforts are being made to control some of the introduced predators, such as rats and cats. In general, it is deemed crucial to continue the work initiated by Santos (2001) in order to find accurate data as to the distribution of the species. The present status of protection and management does not seem suited to its state of conservation.

Remarks

This case illustrates the lack of data on the seabirds which breed on Madeira Island, in contrast with the data available for the Desertas and Selvagens. The dimension and the accessibility of the island may account for such handicap.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △

Little shearwater

Puffinus assimilis baroli (Bonaparte 1857)

Subspecies endemic to Macaronesia - Vulnerable

World Distribution

Scattered over the Atlantic, Pacific and Indian oceans where eight subpecies have been identified. The one that is seen in the Archipelago of Madeira, the *P.a.baroli,* is endemic to Macaronesia, and occurs only in the Archipelagos of Madeira, the Azores and the Canaries. The *P.a.boydi.* occurs in Cape Verde.

Identification

As previously mentioned, on the sea it can be mistaken for the Manx Shearwater *P.puffinus.* Unlike the latter, the black plumage on the Little Shearwater appears on the head only, and the eyes are set on the white plumage.

Habitat

A pelagic seabird which breeds on the cliffs of small islands and islets. The nests are built in cavities and in burrows on the rocks, and also under loose stones.

Conservation

Distribution in the Archipelago, population size and trend

The population of Madeira Island, Porto Santo and the Desertas is rather small, whereas on the Selvagens this species occurs in significant numbers, roughly 2050 breeding pairs (Oliveira & Moniz 1995, Moniz *et al.* 1997) and with a trend towards stability. There is no data on the population trends regarding the other islands.

Threats

It is likely that historically the populations of Madeira and Porto Santo have been affected by rats and cats. As far as the Desertas and Selvagens are concerned human predation an disturbance have probably been the major setbacks. Cory's Shearwater prospecting for a place to breed was identified as a limiting factor in 1994, which accounted for 34% of the failure in the reproduction of the species (Moniz *et al.* 1997).

Red Data Book category

Vulnerable.
Criteria: Colonial species which occupies a very small area (below 20 km^2), and is found in a very restricted number of sites.

Legal Status

- Annexe I of the Birds directive and Annexe II of Bern Convention.
- 80 to 100% of the breeding area is classified as SPA and SCI, and integrated in Natura 2000 Network.
- Nature Reserves of the Islands of Desertas and Selvagens.

Conservation Measures

Since the Desertas and Selvagens are under permanent surveillance, the protection there is considered adequate. For Madeira and Porto Santo the data is scarce, thus, it is of vital importance to carry out investigation to better assess the distribution on those islands.

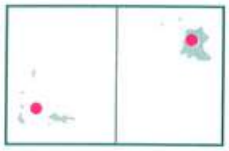
Remarks

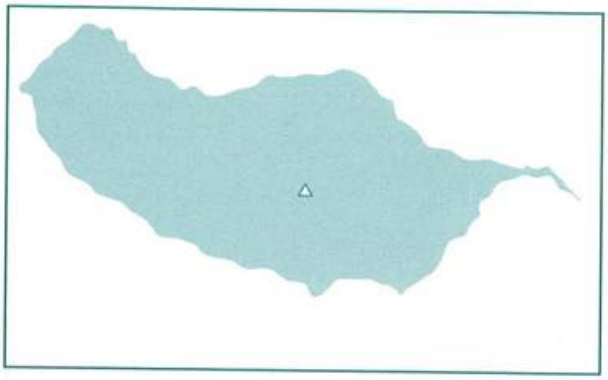
Its migratory movement is short, remaining close to the islands where it breeds. This was confirmed following a study carried out in 1994 (Oliveira & Moniz 1995). During that time individuals that had been ringed when they were nesting were captured on a regular basis outside the breeding period.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





White-faced storm-petrel

Pelagodroma marina hypoleuca (Webb, Berthelot & Mouquin-Tandon 1841)

Subspecies endemic to Macaronesia - Vulnerable

World Distribution

Found mainly in the southern part of the Atlantic, Pacific and Indian Oceans. The Selvagens is the northernmost boundary of the world distribution of the species. The subspecies endemic to the Macaronesia, the *P.m.hypoleuca, occurs* in the archipelagos of Madeira and the Canaries, whereas the subspecies *P.m.eadesi* occurs in Cape Verde.

Identification

When at sea, this bird cannot be mistaken for any other bird due to its peculiar direct gliding flight and for its pattering and bouncing off the water surface.

Habitat

A pelagic seabird which breeds on sandy grounds where it digs deep burrows.

Conservation

Distribution in the Archipelago, population size and trend

It occurs exclusively on the Selvagem Grande, Selvagem Pequena and Ilhéu de Fora. The population is estimated at over 36000 (Campos 1999) and 25000 breeding pairs (Oliveira *et al.* Unpublished data) on the first two islands, respectively. The population trend is thought to be stable.

Threats

Although it was not affected directly by human predation, this species was definitely affected by the constant treading on their breeding ground. Their nests, dug on sandy soil, are very fragile and can easily collapse, thus, suffocating the birds. One other limiting factor for the species was the predation by mice on the Selvagem Grande (Campos 1999).

Red Data Book category

Vulnerable.
Criteria: this species occupies a very small area (under 20 km^2) and it is found in a very restricted number of sites.

Legal Status

- Annexe I of the Birds directive and Annexe II of the Bern Convention.
- 100% of the breeding area is classified as SPA and SCI, integrating the Natura 2000 Network.
- Nature Reserve of the Selvagens.

Conservation Measures

The treading is under control since it occurs in areas of Strict Nature Reserve which are permanently under surveillance. Moreover, the disturbance, the destruction and nest predation were brought to an end as a result of the eradication of the rabbits and mice from the Selvagem Grande.

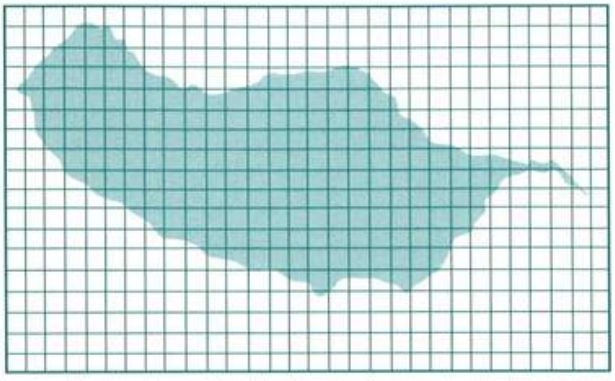
Remarks

This bird breeds in winter, and nothing is known of its whereabouts during the summer.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Madeiran storm - petrel

Oceanodroma castro (Harcourt 1851)

Wide distribution - Least concern

World Distribution

A pelagic species with a worldwide distribution, including the Atlantic and the Pacific. In the Macaronesian area it occurs in the Archipelagos of Madeira, the Azores and the Canaries.

Identification

It is a small dark seabird with a white patch on the lower back.

Habitat

It breeds on small islands, islets and coastal cliffs. Its tiny nests are located on small burrows on the ground, in rock crevices and in stone walls.

Conservation

Distribution in the Archipelago, population size and trend

It is seen on all the islands of the Archipelago of Madeira, as "winter population" and "summer population" (see *remarks)*. However, for Porto Santo breeding has only been confirmed for the Islets. It is likely that the total population of the Archipelago is over 10000 individuals, mainly between the Desertas and Selvagens. The population trend is believed to be stable.

Threats

It is assumed that historically this bird has not been affected by human predation because the nests are very small, difficult to locate and rather difficult to reach. However, the loss and degradation of the habitat might have been a limiting factor on the Island of Madeira. Introduced animals are likely to have been another factor limiting the increase of the population in the Archipelago.

Red Data Book category

Least concern.
Criteria: Population higher than 10000 individuals occurring over a widespread area.

Legal Status

- Annexe I of the Birds directive and Annexe II of the Bern Convention.
- >80% of its breeding area is classified as SPA and SCI, integrating the 2000 Natura Network.
- Nature Reserves of Desertas and Selvagens Islands and PNM.

Conservation Measures

The permanent surveillance being carried out throughout the areas of the Nature Reserves has proved to be of vital importance for the conservation of the species. It is important to define the distribution on Madeira Island so as to enable the formulation of efficient management recommendations. The species would benefit from the introduction of a monitoring scheme for the different populations.

Remarks

In the Archipelagos of Madeira and the Azores there are two populations of this species, temporarily segregated, and which breed yearly during summer and winter, respectively (Monteiro & Furness 1998, Geraldes 2000, Nunes 2000). At the Berlengas, only the population that breeds in winter is seen (Granadeiro & Teixeira 1997).

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △

Sparrowhawk

Accipiter nisus granti (Sharpe 1890)

Subspecies endemic to Macaronesia - Least concern

World Distribution

This species is widely distributed throughout Europe. In Macaronesia it occurs as an endemic subspecies, the *A.n.granti,* in the Archipelagos of Madeira and the Canaries.

Identification

It can be distinguished from other diurnal birds of prey of the Archipelago of Madeira by its medium size and short, rounded wings. It can be distinguished from the Kestrel by its greyish colour.

Habitat

It favours indigenous and exotic forested areas with clearings, where it can fly and hunt sheltered by the vegetation.

Conservation

Distribution in the Archipelago, population size and trend

It occurs only on the Madeira Island where it is scattered all over. There is no reliable data on population size, which is estimated to be between 1000 and 2500 individuals.

Threats

Historically, like the other diurnal birds of prey of the Archipelago, this bird was subjected to intense human persecution. At present, this is considered a remote threat and the species is not deemed to be under any other threat.

Red Data Book category

Least concern.
Criteria: Population between 1000 and 2500 individuals with a vast area of occurrence and occupancy.

Legal Status

- Annexe III of the Bern Convention.
- 20 to 50% of the area of occurrence is classified as SPA and SCI, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

The ongoing management seems to be appropriate to its conservation status. However, regular evaluation is strongly recommended, because, due to the characteristics of the species, a population decline might go unnoticed.

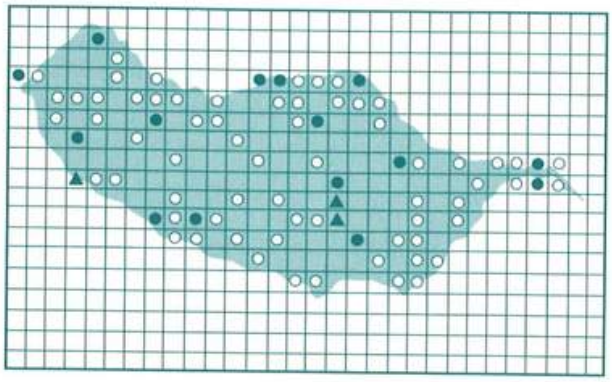
Remarks

In the Canaries this bird is considered common to all the islands that offer the adequate conditions for its occurrence (Martín & Lorenzo 2001).

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Buzzard

Buteo buteo harterti (Swan 1919)

Subspecies Endemic to Madeira Archipelago - Least concern

World Distribution

This species is widely distributed and abundant throughout Europe. In Macaronesia there are four endemic subspecies in the Archipelagos of Madeira, the Canaries, the Azores and Cape Verde, respectively: the *B.b.harterti;* the *B.b.insularum*; the *B.b.rothschildi* and the *B.b.bannermani.*

Identification

The largest bird of prey seen in Madeira, having big, rounded wings and it is very often seen flying in large circles, taking advantage of the rising currents of warm air.

Habitat

It occurs in a wide variety of habitats including: indigenous and exotic woodlands, arid areas with sparse vegetation, farmland as well as urban and suburban areas.

Conservation

Distribution in the Archipelago, population size and trend

Breeding has been confirmed for the Islands of Madeira and Porto Santo, where it is widely seen. The total population is over 2500 individuals occurring mainly in Madeira. In the last two decades the population trends has been positive. It bred on the Ilhas Desertas until 1996 when the few breeding pairs perished (see remarks).

Threats

Historically it was highly affected by human persecution, for various reasons (hunters, domestic bird breeders, among others). On the whole, it was considered an ill-omened bird for man and thus it had to be destroyed. Today the situation has changed, and even though there has not been a radical change in attitude, there is more awareness of the positive effects this bird can have on the ecosystems.

Red Data Book category

Least concern.
Criteria: Population between 2500 and 10000 individuals with a vast area of occurrence and occupancy.

Legal Status

- Annexe III of the Bern Convention.
- 20 to 50% of the area of occurrence is classified as SPA and SCI, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

Even though there are no measures aimed directly at this species, a considerable area of its habitat is protected with the legal status of Strict or Partial Nature Reserve. The ongoing management measures are considered appropriate to its conservation status.

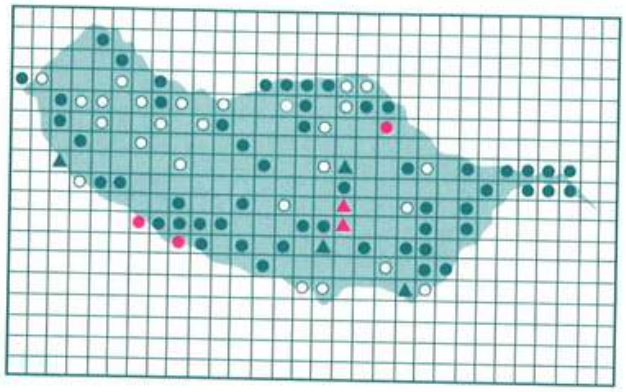
Remarks

The successful project for the "Recovery of the Terrestrial Habitats of the Deserta Grande", unfortunately, led to the loss of the few breeding pairs left. It is believed that it still has not returned as a breeding bird.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Kestrel

Falco tinnunculus canariensis (Koenig 1889)

Subspecies endemic to Macaronesia - Least concern

World Distribution

Species which is seen throughout Europe and in a large part of Africa, including the Archipelago of Cape Verde. In the Archipelagos of Madeira and the Canaries there is a subspecies endemic to Macaronesia, the *F.t.canariensis*. In the Archipelago of the Canaries (Fuerteventura, Lanzarote and the eastern islets) there is one other endemic subspecies, the *F.t.dacotiae*.

Identification

In flight it is easily identified due to its capacity to hover for long periods and because it is the smallest bird of prey in the Archipelago.

Habitat

It occurs in a wide variety of habitats such as indigenous and exotic forests, areas with low vegetation, open farmlands, inner and coastal cliffs or even in the outskirts of large urban areas.

Conservation

Distribution in the Archipelago, population size and trend

It breeds and is widely spread over the Islands of Madeira and Porto Santo. The total population is estimated to be between 2500 and 10000 individuals. Breeding on the Desertas Islands occurred until 1996, date when the few breeding pairs perished (see remarks). Even though some authors have reported its breeding on the Selvagens (e.g. Câmara 1997), this has not been confirmed, at least, during the last decade. Since the 90s the trends is clearly positive.

Threats

In recent historical terms, as is the case of the Buzzard and for the same reasons, human persecution was the major threat facing this species. Nowadays, even though it still persists, it is on a smaller scale and does not put the continuity of the species at risk.

Red Data Book category

Least concern.
Criteria: Population between 2500 and 10000 individuals with a vast area of occupancy and occurrence.

Legal Status

- Annexe III of the Bern Convention.
-20 to 50% of the area of occurrence is classified as SPA and SCI, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

Even though there are no specific measures intended for this species, vast areas of its habitat are protected under the legal status of the Strict and Partial Nature Reserves. The ongoing management is considered adequate to its conservation status.

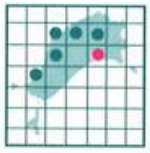
Remarks

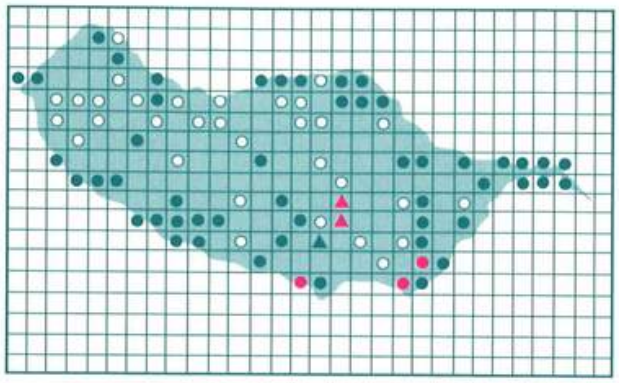
It was also affected by the project for the "Recovery of the Terrestrial Habitats of the Deserta Grande", and as yet it has not returned as a breeding species.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Partridge

Alectoris rufa hispanica (Seoane 1891)

Wide distribution - Not evaluated

World Distribution

Introduced species whose original range in Europe included mainly the Iberian Peninsula and France. Three subspecies have been identified, which, as a result of successive introductions in some European countries, at present do not have a range accordant to that originally documented.

Identification

It can be identified by its rounded shape and by the general pattern of its plumage, with black bars on the flanks. Its red legs are another typical feature of this bird.

Habitat

It uses mainly areas with low or open indigenous and exotic vegetation, permitting fast running and ample visibility.

Conservation

Distribution in the Archipelago, population size and trend

It breeds on the Islands of Madeira and Porto Santo with a patchy distribution. The natural population trend is obscured by the fact that this is a cynegetic species and due to annual population reinforcements.

Threats

In Europe it is threatened by the changes in the farming methods (Aebischer & Lucio 1997). This applies to the Archipelago of Madeira where the farming of wheat and of other cereals is scarce. However, the main threat is deemed to be the possible hunting overexploitation.

Red Data Book category

Not evaluated.
Criteria: Introduced species.

Legal Status

- Cynegetic species included in the Annexe II of the Birds directive and Annexe III of the Bern Convention.
- <50% of its area of occurrence is classified as SPA and SCI, integrating the Natura 2000 Network
- PNM.

Conservation Measures

It is managed as a cynegetic species and in Madeira birds are produced in captivity for future release. Due to the existing hunting pressure, the population is likely to depend on these annual population reinforcements.

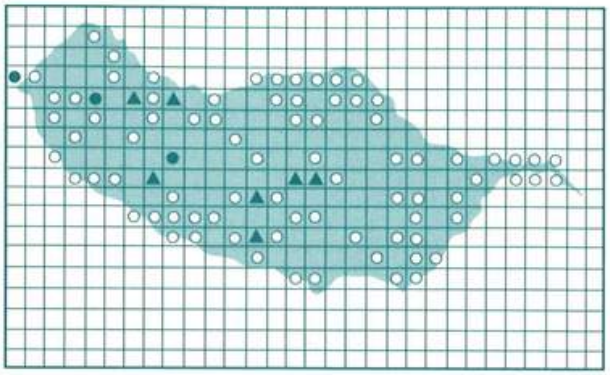
Remarks

Questions arise regarding the ethics of hunting and the production in captivity of cynegetic species, which goes beyond the scope of the analysis made in this book.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Quail

Coturnix coturnix confisa (Hartert 1917)
Subspecies endemic to Macaronesia - Least concern

World Distribution

Five subspecies are recognized, having a worldwide range which extends over a vast area of the Eastern Paleartic, as far as China and India and it is also found in Africa. *C.c.confisa* endemic to Macaronesia, is found on Madeira and the Canary Islands, while *C. c. conturbans* and *C.c.innopinata* inhabits the Azores and Cape Verde, respectively.

Identification

A round shaped bird like the Partridge but much smaller in size and with a more homogeneous brownish plumage.

Habitat

Prefers wide open spaces, with level or undulating landforms and normally clear of trees and bushes. It also searches cereal farmland, a very scarce habitat in Madeira.

Conservation

Distribution in the Archipelago, population size and trend

It is found on the islands of Madeira and Porto Santo. There is no reliable data as to the size of the population, which is estimated to be between 2500 and 10000 individuals and the population trend is believed to be stable. It is often seen on the Desertas but breeding at that site has never been confirmed.

Threats

There is no data available to enable the identification of the limiting factors affecting this species. However, since Quails build their nests on the ground, it is likely that they are faced with intense rat predation. Loss of habitat is deemed to be another potential threat.

Red Data Book category

Least Concern.
Criteria: Population between 2500 and 10000 individuals and a wide area of occurrence and occupancy.

Legal Status

- A cynegetic species included in the Annexe II of the Birds Directives and Annexe III of the Bern Convention.
- <50% of its area of occurrence is classified as SPA and SCI, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

Considering that, on one hand, it has a high value of conservation, while on the other hand, it is a cynegetic species, research is strongly recommended in order to determine with accuracy its distribution, population size and trends. As a precautionary and temporary measure, hunting should be banned in Strict and Partial Nature Reserve areas.

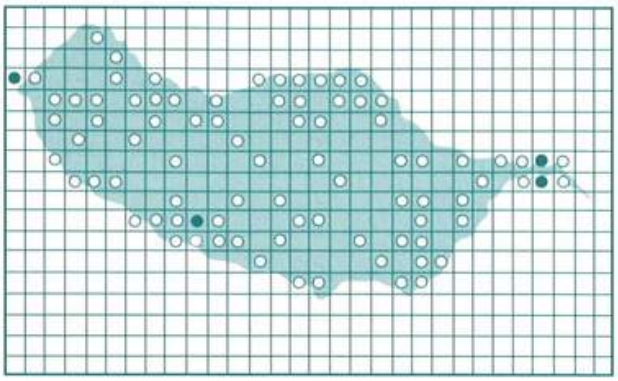
Remarks

Some authors refer to the existence of some migratory individuals during the summer months (e.g. Bannerman & Bannerman 1965).

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Moorhen

Gallinula chloropus (Linnaeus 1758)

Wide distribution - Critically endangered

World Distribution

This species has a wide distribution including vast areas of Europe, Asia, Africa and America. In Macaronesia it is found in the Archipelagos of Madeira, the Azores, the Canaries and Cape Verde.

Identification

In the Archipelago of Madeira it cannot be confused with any other breeding species. It looks essentially black at any distance, with a unique combination of a white line along the top of flanks and white lateral under tail-coverts. It also exhibits a prominent bill and frontal shield.

Habitat

It necessarily requires ready access to at least a minimum of open fresh water with adequate plant cover. It is found in wet environments and well-vegetated lakes or ponds.

Conservation

Distribution in the Archipelago, population size and trend

It is found on small artificial dams on Porto Santo and on a tiny semi-natural coastal lake, the lake of Lugar de Baixo, in Madeira (Fagundes & Nunes 2003).

Threats

The type of habitat favoured by this species does not occur much in the Archipelago of Madeira, therefore they are seen mostly in man-made places (small reservoirs of water) or some semi-natural environments. As a result, the habitat is extremely limited and usually related to human activities, which results on a rather precarious conservation status.

Red Data Book category

Critically endangered.
Criteria: A very small population, believed to be fewer than 50 mature individuals.

Legal Status

- Annexe III of the Bern Convention.
- Area of occurrence outside any SPA or SCI.
- Area of occurrence outside any Protected Area.

Conservation Measures

There are no management measures aimed at this species. Taking into consideration the lack of natural habitat (see remarks) on one hand, and its conservation status in Europe, on the other hand, this cannot be considered of priority.

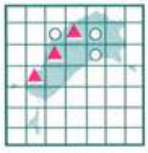
Remarks

On some of the Canary Islands, the species is also found outside the man-made sites, on the banks of small rivers with dense vegetation (ex. Canes *Arundo donax*) (Martin & Lorenzo 2001). Since such habitats also occur in Madeira, it is likely that in the future the species may choose such sites. Should this occur, a different approach and new management measures will have to be put into effect.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Kentish plover

Charadrius alexandrinus (Linnaeus 1758)

Wide distribution - Critically endangered

World Distribution

This species, which can be divided into five subspecies, has a worldwide distribution, breeding on most continents, Europe, Asia, Africa, and America. In Europe it breeds on the coastal areas of the Baltic Sea, North Sea, Atlantic Ocean, Mediterranean Sea and Black Sea. In Macaronesia it is found in all the Archipelagos.

Identification

It can easily be distinguished from the Little Ringed plover, *C.dubius*, a species which occasionally occurs in the same habitat. Whereas this species displays a full collar around the neck and yellow legs, the Kentish Plover has a broken dark collar around the neck, and dark legs.

Habitat

It is primarily found in coastal areas, favouring sandy soil.

Conservation

Distribution in the Archipelago, population size and trend

It occurs only on Porto Santo, and according to a survey carried out in three different years (1999 to 2001) the population is estimated to be between 50 and 250 individuals; probably below the lower limit (J. Nunes com. pess.). There is no reliable data on the population trend, but it is deemed to be stable.

Threats

The fact that Porto Santo, in general, and the habitat where the species occurs, in particular, is much sought after by tourists and visitors, represents a major threat and one which cannot easily be curbed.

Red Data Book category

Critically endangered.
Criteria: Reduced population which might well be fewer that 50 mature individuals.

Legal Status

- Annexe III of the Bern Convention.
- Area of occurrence outside any SPA or SCI.
- Area of occurrence outside any Protected Area.

Conservation Measures

There are no specific measures directed at this species or at its habitat. However, the recent classification of some of the sandy areas of Porto Santo as IBA's (Costa *et al.* 2003), might foster effective measures to protect that habitat.

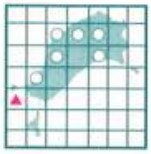
Remarks

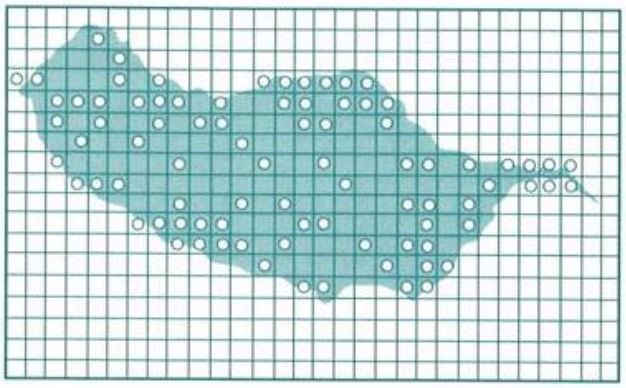
Despite the fact that it is critically endangered in the Archipelago of Madeira, it cannot be considered of priority, due to its worldwide status.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Woodcock

Scolopax rusticola (Linnaeus 1758)

Wide distribution - Vulnerable

World Distribution

Found throughout most of Europe and occurring in the Archipelagos of Macaronesia, except for Cape Verde. No subspecies are known on the Atlantic Islands, therefore the species that is found there is the nominal.

Identification

It is very difficult to have good observations of this bird. Its long bill pointing obliquely downwards distinguishes it from any other species in the Archipelago.

Habitat

It favours mainly dense woodland and areas covered with heather.

Conservation

Distribution in the Archipelago, population size and trend

It breeds only on Madeira Island where the population is estimated to be between 250 and 2500 individuals. It is thought to have a negative population trend. Although breeding on Porto Santo has not been confirmed, one bird was shot in 1997 and another one in 1998 (Câmara com. pess.).

Threats

Historically the loss of habitat is deemed to have been a limiting factor. At present, since it nests on the ground, the predation of eggs and juveniles by rats is likely to be a major threat.

Red Data Book category

Vulnerable.
Criteria: Species with a very small population (between 250 and 2500 individuals).

Legal Status

-Included in the Annexe II/III of the Birds Directive and Annexe III of the Bern Convention.
- 20 to 50% of the breeding area is classified as SPA and SCI, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

Even though there are no measures aimed directly at this species, a considerable area of its habitat is protected under the legal status of the Strict or Partial Nature Reserve. It is not known whether the ongoing management measures are adequate for its conservation status.

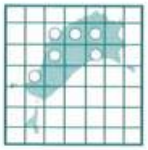
Remarks

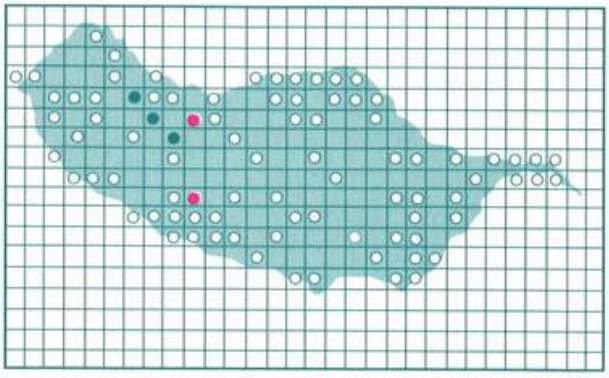
As with the Quail, the status of this cynegetic species ought to be taken into further account or temporarily cancelled, until there are enough data to enable accurate determination its conservation status, population size and trends.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Yellow - legged Gull

Larus cachinnans atlantis (Clements 1991)

Subspecies endemic to Macaronesia - Least concern

World Distribution

It is widely distributed all over the world from the northernmost corner of China, Mongolia to Southern Europe, primarily in the Atlantic and Mediterranean coastal areas. Only three subspecies are acknowledged and of the three species only the *L.c.atlantis*, occurs in the Archipelagos of Madeira, the Canaries and the Azores, breeding on all the islands.

Identification

Adults are easily identified by its size, grey back, red spot on the beak and yellow legs.

Habitat

It is found in a wide variety of habitats, favouring places with little disturbance such as islands, islets and coastal cliffs where it spends the night and breeds. During the day it is found in man-made environments to which it has adapted extremely well.

Conservation

Distribution in the Archipelago, population size and trend

It occurs on all the islands of the Archipelago of Madeira. The actual population is distributed mainly over the Islands of Madeira and Desertas, where the population is estimated to be greater than 1650 and 700 breeding pairs, respectively. On Porto Santo it breeds primarily on the larger islets, with a population of about 1600 breeding pairs (Fagundes *et al.* 2002). On the Selvagens the population does not exceed 30 breeding pairs. The population trend is deemed to be stable.

Threats

No threat has been identified.

Red Data Book category

Least concern.
Criteria: Population estimated to be between 2500 and 10000 individuals with a vast area of occurrence and occupancy.

Legal Status

- Annexe III of the Bern Convention.
- 20 to 50% of the area of occurrence is classified as SPA and CIS, integrating the Natura 2000 Network.
- Nature Reserves of the Desertas and Selvagens Islands and PNM.

Conservation Measures

This species has proliferated due to its association with human beings, hence the introduction of a monitoring scheme to evaluate population trends and its impact on the ecosystems. The rapid increase in numbers has been under control through techniques that reduce the productivity of the most important colonies. For now there are no reasons to adopt further measures, such as the massive extermination of adult individuals.

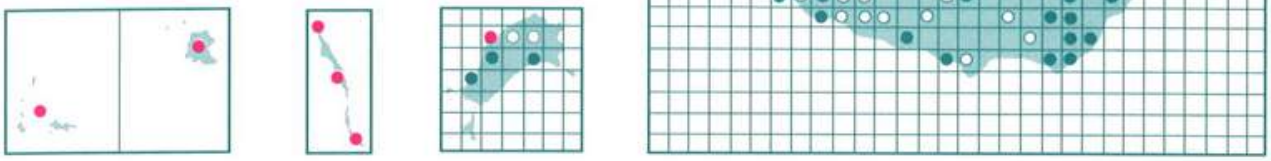
Remarks

The recent introduction of adequate solid waste management measures will probably have a negative effect on the Yellow – legged gull in the Archipelago of Madeira. The poisoning of thousands of birds carried out under multiple programs for the control of the population, is another distressing example of the measures that man has to enforce so at to correct the imbalance created by man himself. Contrary to what many feel, the Gulls deserve as much respect and consideration as the Madeira's Petrel or any other bird.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Common tern

Sterna hirundo (Linnaeus 1758)

Wide distribution - Vulnerable

World Distribution

It is a species with a large worldwide distribution. It breeds throughout the whole European Continent mostly in the north. In the Macaronesia it is represented by the nominal species and it breeds in the Archipelagos of Madeira, the Azores, and the Canaries.

Identification

This bird is of a much smaller size than the Yellow legged seagull, with narrow wings, vigorous bill and short feet.

Habitat

It is a migratory bird that, although it is not exclusively coastal, in Madeira Archipelago it breeds on islets, small islands and rocky cliffs.

Conservation

Distribution in the Archipelago, population size and trend

It is found scattered and in small colonies throughout all the islands. In the last five years breeding has been confirmed for the Selvagem Grande. Based on casual visits to many potential sites for the species and/or where occurrence has been documented, the population is estimated to be between 250 and 2500 individuals. Traditionally the population of this species is very erratic, however in the Archipelago the population trend tends to be stable (except for the Selvagens where it has decreased dramatically in the last five years).

Threats

Historically the loss and degradation of the habitat is likely to have been a factor that thwarted its distribution and numbers. Human disturbance and the gradual degradation of the coastal habitat are liable to be its major threats at present.

Red Data Book category

Vulnerable.
Criteria: a colonial species with a reduced population (which is admittedly fewer than 1000 mature individuals) and occurring over a very restricted area (under 20 Km^2).

Legal Status

- Annexe I of the Birds directive.
-50% of the breeding area is classified as SPA and SCI, integrating the 2000 Natura Network.
- Nature Reserve of Desertas and Selvagens Islands and PNM.

Conservation Measures

There are no specific measures designed for this species. However, it breeds in areas that fall under the Strict Reserve status, and is thus, adequately protected. It would be advisable to determine the favoured areas of distribution throughout the Madeira Island.

Remarks

Taking into account its worldwide distribution and the inconsequential role played by the Madeirean population, it is not considered a priority species.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △

Rock pigeon

Columba livia atlantis (Gmelin 1789)

Subspecies Endemic to Macaronesia -Data deficient

World Distribution

In the wild it occurs under two different forms the pure and the feral. A widespread species, whose original distribution is unclear due to its hybridization with feral and domestic pigeons. In the Macaronesia there are two subspecies, *C.l.atlantis* in the Archipelagos of Madeira, the Azores and the Cape Verde and *C.l.canariensis* in the Canaries.

Identification

The pure pigeon has two black bands across the wings and white uropygium, which becomes very conspicuous in flight. The feral pigeon usually displays a wide variety of plumage.

Habitat

The pure pigeon relishes slopes and cliffs with little vegetation mainly close to the sea. The feral pigeons are seen in vast range of habitats including inhabited areas.

Conservation

Distribution in the Archipelago, population size and trend

There is absolutely no data on the distribution or population count for the pure form. The number of pure individuals is believed to be relatively small, probably even very rare. However the two forms together, the pure and the feral, are abundant on Madeira as well as Porto Santo. It occasionally occurs on the Desertas but does not breed there regularly. The population trend for the two forms together is considered to be stable.

Threats

The main threat the species is faced with is hybridization between wild, feral and domestic.

Red Data Book category

Data deficient.
Criteria: no reliable data to enable the application of IUCN. As a matter of fact, there is lack of basic information as to the population size and trends.

Legal Status

- Annexe III of the Bern Convention.
- <20 % of the breeding are is classified as SPA and SCI, integrating the 2000 Natura Network.
- PNM.

Conservation Measures

There is no action plan regarding the protection of this species. It is, however, vital to understand to what extent the pure forms are being affected by hybridization and determine the extent of this threat.

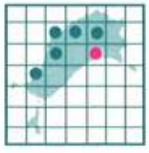
Remarks

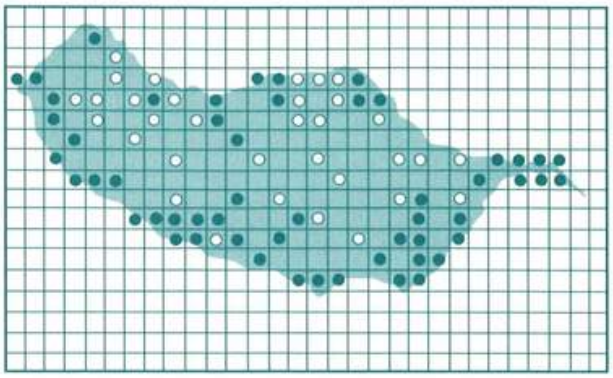
Hybridization is a problem usually found in places where the species occur very close in taxonomic terms. This comes from the fact that it is easy for the individuals bred in captivity to adapt easily to the natural environment.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Madeira laurel pigeon

Columba trocaz (Heineken 1929)

Endemic Species - Vulnerable

World Distribution

A species endemic to the Archipelago of Madeira. In the Macaronesian two other endemic species are found, *C.bollii* e *C.junoniae* in the Canaries, and a subspecies endemic to the Azores, *C.palumbus azorica*.

Identification

Easy to identify due to its blue grey colour, by the red wine breast and the wide band across the tail.

Habitat

Pigeons have a strong preference for laurel forest below 800 meters, especially dense canopied forest on steep slopes where the Bay tree is the dominant species. When availability of fruits decrease they move to more open areas, where the herbaceous and shrub layers of the forest are more diverse (Oliveira 2003). Nevertheless those areas with exotic vegetation on the boundaries of native forest are also used extensively all year round.

Conservation

Distribution in the Archipelago, population size and trend

It breeds only in Madeira Island, being the only terrestrial endemic bird of the Archipelago. It is documented to have had a wider distribution reaching Porto Santo (Pieper 1985). The population is estimated to be about 7000 individuals (Oliveira *et al.* unpublished data), and it is deemed to have a negative trend (Jones 1990, Oliveira *et al.* 1999, Oliveira *et al.* 2003), probably as a result of stochastic factors (factors inherent to the species and its habitat and not controlled nor directly influenced by man).

Threats

Historically the loss and degradation of the habitat was an important limiting factor (Zino & Zino 1986, Jones *et. al* 1989, Jones 1990). At present, as a result of the damage it causes to crops, the species is very unpopular among the rural communities and thus it falls victims to poisoning and illegal shooting (Oliveira & Heredia 1996, Oliveira 2003).

Red Data Book category

Vulnerable.
Criteria: This species breeds on a very restricted number of sites.

Legal Status

- Annex I of the Birds directive and Annex III of the Bern Convention.
- 80 to 100% of its breeding area is classified as SPA and SCI, integrating the 2000 Natura Network.
- PNM.

Conservation Measures

The laurel forest, Natural World Heritage under UNESCO, has the status of Strict or Partial Nature Reserve and thus the loss and degradation of the habitat is no longer a threat. On the other hand, the farmers have received some kind of support to minimize the damages caused on the crops. At present they are being given two different devices: bird gas scarers and protections nets (Oliveira & Jones 2001). As an emergency measure, following what happened in the end of the 90s, in 2004 the shooting of birds in areas where agriculture had been badly damaged was been allowed.

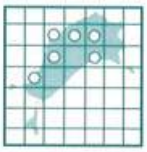
Remarks

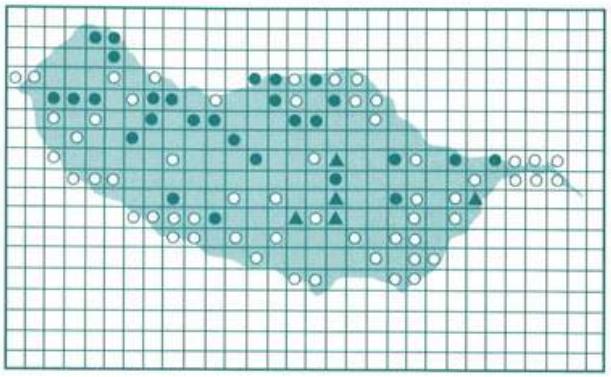
Two recent studies, using microhistological techniques, have identified about 40 species of plants included in their diet (Oliveira *et al.* 2002, Marrero *et al.* 2004). It was also found seeds mechanically viable from all the trees of the laurel forest, as well as tree leaves, bushes and shrubs.
It should be noted, also, that in Madeira island there was another endemic bird *C.palumbus madeirensis* which became extinct following the arrival of man on the island.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Owl

Tyto alba schmitzi (Hartert 1900)

Endemic Subspecies- Least Concern

World Distribution

This species occurs on all the Continents except the Antarctica. 35 subspecies are recognized and the one which breeds in the Archipelago of Madeira *Ta.schmitzi* is endemic. In the Canaries, besides the nominal species *T.a.alba* there is also *T.a.gracillirostris*, whereas in Cape Verde *T.a.detorta* is found. This species does not breed in the Azores.

Identification

This is the only terrestrial nocturnal bird of the Archipelago of Madeira and it can easily be identified by the slender silhouette in flight and by the acute and strident scream.

Habitat

It occupies a wide range of habitats such as inhabited areas, from urban to rural, woodlands with openings or the outskirts of farmland, open grassland and deep valleys inland.

Conservation

Distribution in the Archipelago, population size and trend

Breeding of this species has only been confirmed for Madeira Island, even though they are regularly seen in Porto Santo. Until 1995 it was a breeding bird in the Desertas (see remarks). On the whole the population is estimated to be between 2500 and 10000 individuals spread throughout the Island but is rarely seen on high sites such as the Central Mountainous Massif (Marques *et al.* 2003, Ferreira in prep.). The population trend is assumed to be stable.

Threats

Historically human persecution, basically led by beliefs and superstitions, was the major threat the species was confronted with. Currently, such threat no longer holds since the population is better educated and there is greater awareness, which accounts for the increase of the population in the last decade.

Red Data Book category

Least Concern.
Criteria: Population between 2500 and 10000 individuals distributed over a vast area.

Legal Status

- Annexe II of the Bern Convention.
- <50% of the area of occurrence is classified as SPA and SCI, integrating the 2000 Natura Network.
- PNM.

Conservation Measures

There is no specific action plan aimed at this species. However, some of the areas where it occurs fall under the PNM. The ongoing measures are deemed adequate to its conservation status.

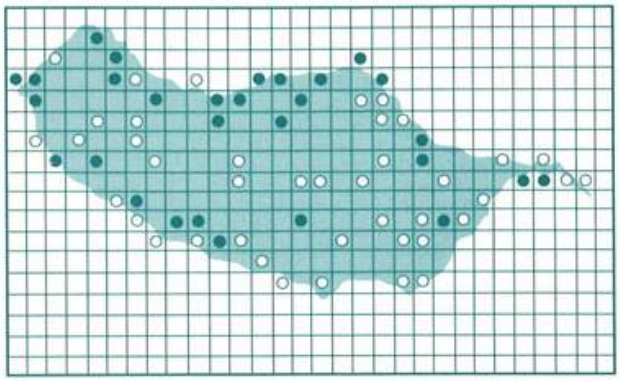
Remarks

Until 1996 this bird occurred and bred in the Desertas even though in very limited numbers. However, a project carried out to eradicate the herbivorous from the area led to its loss. Considering the abundance of this bird in the Archipelago, and considering the advantages of clearing these islands from introduced species, such loss is regrettable but acceptable.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Pallid swift

Apus pallidus brehmorum (Hartert 1901)

Distribuição Ampla - Dados Insuficientes

World Distribution

It has a worldwide distribution and in Europe it is found mostly along the Mediterranean and in Portugal. In the Archipelagos of Madeira and the Canaries its represented by the same subspecies that occurs on the South of Europe and the North of Africa. It is regarded as a summer bird on both Archipelagos (Bernstrom 1951 and Aurelio & Lorenzo 2001).

Identification

Inexperienced bird watchers find it very difficult to differentiate from the Plain swift. Unlike this bird the Pallid swift has white throat patch and a less homogeneous colour plumage.

Habitat

It relishes islets and coastal cliffs, however, it can occur in other habitats inland, from mountains, to rural and urban areas.

Conservation

Distribution in the Archipelago, population size and trend

It is found on Madeira and Porto Santo Islands, although breeding has only been confirmed on the former. Allegedly it has a small population, however, due to the similarities with A.unicolor, not enough is known as to its distribution, abundance and population trend.

Threats

There is no reference about any threats to this species, whether historical or current.

Red Data Book category

Insufficient data.
Criteria: there is no sufficient data to apply the IUCN criteria. As a matter of fact, nothing is known as to population size or trends.

Legal Status

- Annexe II of the Bern Convention.
- Nothing is known about what percentage of its breeding area is classified as SPA and SCI.
- PNM.

Conservation Measures

There is no specific scheme covering this species. It is important to carry out research in order to obtain important basic information about breeding areas and periods, distribution, population size and conservation status in the Archipelago.

Remarks

Out of the species that breed in the Archipelago this is probably the one which there is the least data. Even the recognition of its existence is restricted to those interested in ornithology. This is partly due to the fact that the number of regular observers on the Island who can distinguish this species from A.unicolor is rather scarce.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △

ALFREDO 84

Plain swift

Apus unicolor (Jardine 1830)

Species Endemic to Macaronesia - Least Concern

World Distribution

It occurs only in the Archipelagos of Madeira and the Canaries. The populations of both Archipelagos are partly migratory and recent data revealed that in the winter they travel to the North of Africa (Chantler & Driessens 1995). Some migrating individuals have been seen on the Desertas (Mougin *et al.* 1987). In the Archipelago of the Cape Verde there is an endemic species of the same genus, *A.alexandri,* found on all the islands (Naurois 1986).

Identification

Apparently it is easy to identify this bird because its silhouette is typical of any swift. It can, however, be mistakenly taken for the Pallid swift. It has a dark plumage all over and a typical swift flight (refer to the identification of the Pallid swift).

Habitat

It occurs in distinct habitats, provided they have access to insects to feed on while flying.

Conservation

Distribution in the Archipelago, population size and trend

It is documented to breed on the Islands of Madeira and Porto Santo, and the population is estimated to be fewer than 10000 individuals. These numbers refer to the total population during the warm season for the number of birds observed in winter is dramatically lower. It is often seen on the Desertas, but breeding on that area is not confirmed. There is no reliable data as to the population trend, however, it is believed to be stable.

Threats

No threat or limiting factor have been identified, at least while in the Archipelago.

Red Data Book category

Least concern.
Criteria: Population between 2500 and 10000 individuals with a widespread area of occurrence and distribution.

Legal Status

- Annexe II of the Bern Convention.
- <50% of its breeding area is classified as SPA and SIC, integrating the 2000 Natura Network.
- PNM.

Conservation Measures

There is no action plan aimed at this species in particular. However, its area of occurrence as well as its breeding area fall under the PNM Strict or Partial Nature Reserve, and thus it is deemed adequate to its conservation status. Nevertheless, further research should be encouraged, namely a monitoring scheme that will enable to follow the population trends.

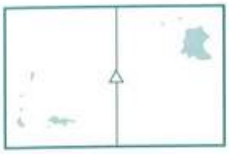
Remarks

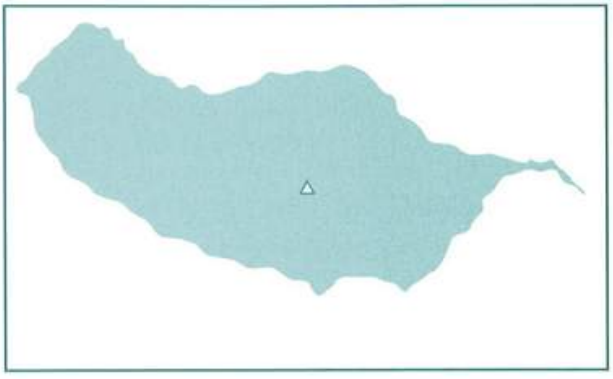
Like the Canary, the Berthelot's pipit and the Fea's petrel, this species is exclusive to Macaronesia. It does not occur anywhere else on the planet, which gives the species an important conservation value. For this reason the data available on this species is deemed highly insufficient.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Hoopoe

Upupa epops epops (Linnaeus 1758)

Widespread Distribution - Vulnerable

World Distribution

It is widespread and locally common in central and southern Europe. In the Macaronesia it is represented in the Archipelagos of Madeira and the Canaries by its nominal species. The populations of the different islands of the Canaries vary considerably, which gave rise to proposals to divide the species into various subspecies (Martin & Lorenzo 2001).

Identification

An unmistakable bird due to its silhouette, the black and white banding across its wings and tail, the long, down-curved bill and the prominent crest that stands out even in flight.

Habitat

This bird favours the ground, so its habitat in general involves open country covered with vegetation or shrubs and agricultural areas. In general this species relishes dry sites.

Conservation

Distribution in the Archipelago, population size and trend

Breeding has only been confirmed for Porto Santo where most of the population of the Archipelago resides. Even though there is no reliable data, the population is estimated to be between 250 and 2500 and the population trend is believed to be stable.

Threats

Despite the scarce information on this bird, judging from its alleged population trend, in the short and medium term no threat is likely to endanger the species.

Red Data Book category

Vulnerable.
Criteria: species with a small population (likely to be fewer than 1000 individuals), occupying a restricted area (under 20 Km^2) and occurring on a limited number of locations.

Legal Status

- Annexe II of the Bern Convention.
- 0 to 20% of its area of occurrence is classified as SPA and SIC, integrating the 2000 Natura Network.
- It does not occur in substantial numbers on any of the protected areas.

Conservation Measures

There is no action plan aimed at this species in particular. In spite of the fact that part of its habitat was recently classified as IBA, it does not fall under any protection programme. It would be worthwhile to introduce a monitoring scheme that would enable to assess the population trend.

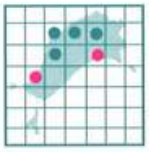
Remarks

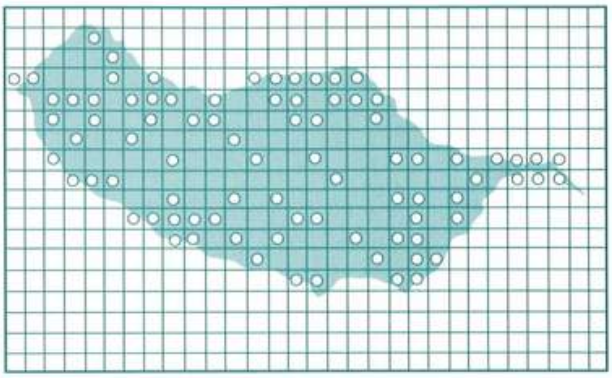
Extremely peculiar bird that could be used as an emblem in future awareness campaigns and for training observers in Porto Santo.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Berthelot's pipit

Anthus bertheloti madeirensis (Erlanger 1899)
Anthus bertheloti bertheloti (Bolle 1862)
Species Endemic to Macaronesia - Least Concern *(A.b. madeirensis)*
Vulnerable *(A.b. bertheloti)*

World Distribution

A species endemic to Macaronesia, occurring solely in the Archipelagos of Madeira and the Canaries. The endemic subspecies *A.b.madeirensis* occurs in Madeira, while *A.b.bertheloti* occurs in the Selvagens and the Canaries.

Identification

It is identified by its silhouette and its fidgety behaviour on the ground. In flight it can be identified by the conspicuous white streaks. The difference between the two species is very subtle, not easily distinguishable in the field.

Habitat

It favours rocky, open and scrubby terrain at all altitudes where such habitat is available, from the sea shore to the highest peaks on the Island. In the Selvagens, it is mainly found on the plateau. It is seldom seen on cliffs, especially on rocky cliffs or cliffs with no vegetation.

Conservation

Distribution in the Archipelago, population size and trend

A.b.madeirensis is a resident of Madeira, Porto Santo and Desertas, where the population is estimated to be fewer than 10000 individuals. *A.b.bertheloti*, which occurs on the Selvagem Grande and Selvagem Pequena, travels between the two islands (Geraldes, Menezes & Oliveira unpublished data) and the population is estimated to be about 300 individuals (Oliveira *et al.* 2003). The population trend for the *A.b.madeirensis* is deemed to be stable, whereas the *A.b.bertheloti* shows a positive trend (see remarks).

Threats

A.b.madeirensis does not seem to be under any threat, while *A.b.bertheloti*, due to the size of its population, is naturally vulnerable.

Red Data Book category

A.b.madeirensis – Least Concern.
Criteria: Population between 2500 and 10000, distributed over a vast area.
A.b.bertheloti – Vulnerable.
Criteria: Subespecies with a very small population, 300 individuals, occupying a restricted and reduced number of locations.

Legal Status

- Annex II of the Bern Convention
A.b.madeirensis
- 50% to 80% of its area of occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- Ilhas Selvagens Nature Reserve and PNM.
A.b.bertheloti
- 100% of its area of occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- Ilhas Selvagens Nature Reserve.

Conservation Measures

No specific action plan is designed for the species. Nevertheless, the protection management underway is deemed adequate due to the fact that the species mainly occurs in protected areas.

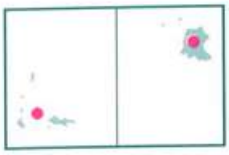
Remarks

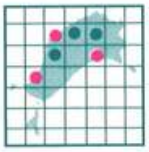
After a sharp decline in population as a result of the *Project for the Restoration of the Terrestrial Habitats of the Selvagem Grande*, carried out in 2002, the population trends of the species on the Selvagens is positive, and the numbers are even higher than before (Menezes *et al.* 2003, Oliveira *et al.* 2003). This is the result of the eradication of the rats and rabbits, which brought the disturbance and predation of eggs and juveniles to an end.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Grey wagtail

Motacilla cinerea schmitzi (Tschusi 1900)

Endemic Subspecies - Least concern

World Distribution

It has a patchy distribution throughout Europe, Northeast Africa and Asia. In Macaronesia there are three distinct and endemic subspecies: *M.c.schmitzi* in Madeira, *M.c.canariensis* in the Canaries and *M.c.patriciae* in the Azores.

Identification

Identified by the conspicuous yellow breast and wagging tail. It has an undulating flight, usually accompanied by a sharp and high-pitched call.

Habitat

It occupies different types of habitat, but relishes areas with water, such as stream beds and irrigation canals. It can be seen from the sea shore to the highest points on the island.

Conservation

Distribution in the Archipelago, population size and trend

It breeds on Madeira Island only. There have been reports of breeding activity on Porto Santo, but recent monitoring has not confirmed this. The total population is estimated to be between 2500 and 10000 individuals, and apparently the trend is towards stability.

Threats

No threat has been identified.

Red Data Book category

Least Concern.
Criteria: Population between 2500 and 10000 individuals and occupying a widespread area.

Legal Status

- Annexe II of the Bern Convention.
- 50 to 80% of its area of occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

There is no specific action plan aimed at the species, however, the ongoing protection seems appropriate to the current conservation status.

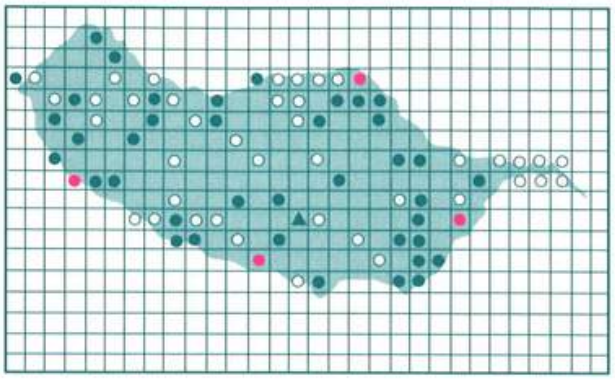
Remarks

With three subspecies across Macaronesia, this species is a good example of the insular bio-geography.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Robin

Erithacus rubecula rubecula (Linnaeus 1758)

Widespread Distribution - Least Concern

World Distribution

This species is widespread across most of Europe. In the Archipelagos of Madeira and the Azores there is the nominal European species *E.r.rubecula*. This same species occurs in the Canaries along with *E.r.superbus*, which is endemic. It is believed that the Archipelagos of Madeira and the Canaries receive migratory individuals from the European populations.

Identification

It is an unmistakable bird because of its rounded shape and orange breast, a characteristic which gave origin to its vernacular name in Madeira: *Papinho* (doublechinned).

Habitat

It is seen in any area with a mixture of trees or shrubs, namely indigenous forests, exotic forests, transition forests, heather, farmland or urban gardens.

Conservation

Distribution in the Archipelago, population size and trend

On a regular basis, it occurs across Madeira only. Even though breeding in Porto Santo has been recently confirmed (Barone & Delgado 2001), currently it is not a regular breeder on the island. In Madeira it is a very common species found everywhere, from the lowest to the highest sites, and the population is thought to be greater than 10000 individuals. The population trend is apparently stable or positive.

Threats

No threat affecting this species has been identified.

Red Data Book category

Least Concern.
Criteria: Population likely to be bigger than 10000 individuals, distributed across a widespread area.

Legal Status

- Annex II of the Bern Convention.
- 50 to 80% of its area of occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

There is no action plan aimed at this species. However, a major area of its occurrence is under the Strict or Partial Nature Reserve of PNM. The ongoing protection scheme is appropriate to its conservation status.

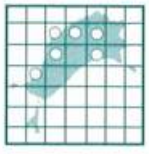
Remarks

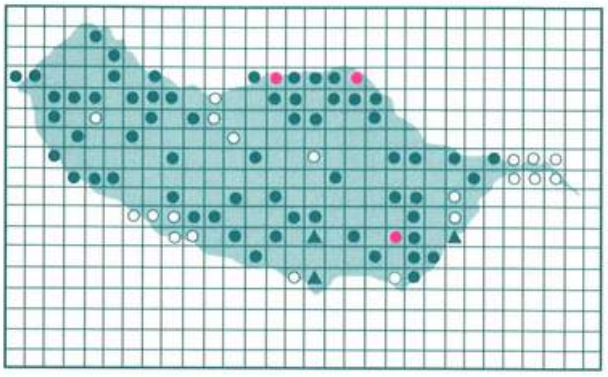
Some authors include the population of Madeira in the subspecies *E.r.microrhynchus*. However, since there is no consensus on this separation, we ourselves take a conservative approach and consider it to fall under the nominal subspecies.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Blackbird

Turdus merula cabrerae (Hartert 1901)

Endemic subspecies to Macaronesia - Least Concern

World Distribution

Widespread throughout the whole of Europe, except for the northeastern most sites. *T.m.cabrerae*, a subspecies endemic to Macaronesia is resident in Madeira and the Canaries, whereas *T.m.azorenzis*, also an endemic subspecies, is found in the Azores.

Identification

It can easily be identified by its structure and its all-black body contrasting with the bright yellow bill. It reveals sexual dimorphism, the females are black-brownish all over, and their bill is dark instead of yellow.

Habitat

It occurs in a wide range of habitats, from strictly indigenous forests, exotic forests, farmland, woodland, heather to urban areas. It can be seen across the island, except in arid areas

Conservation

Distribution in the Archipelago, population size and trend

It occurs on Madeira Island only and the population is estimated to be bigger than 10000 individuals. The population trend is presumed to be stable. It can be found in large numbers across the range of elevations of the island.

Threats

No threat affecting this species has been identified.

Red Data Book category

Least Concern.
Citeria: Population likely to be greater than 10000 individuals, with a widespread occurrence and distribution.

Legal Status

- Annex II of the Birds Directive and Annex III of the Bern Convention.
- 20 to 50% of its area of occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

There is no action plan aimed at this species in particular. However, some of the areas of its habitat are included in the Strict or Partial Nature Reserve of PNM. The ongoing protection matches its conservation status.

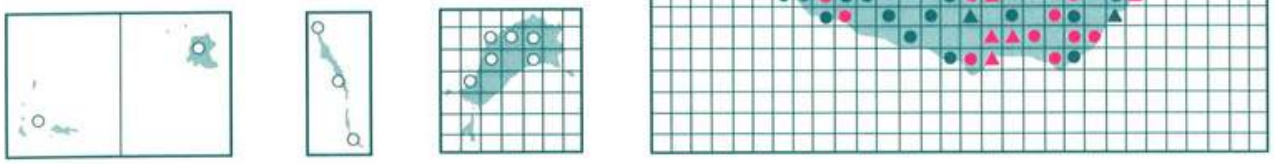
Remarks

Because of its abundance, distribution and characteristics, namely its structure and call, this species should be used as a flagship for awareness campaigns. Moreover, the observation of this bird should be encouraged as it might well contribute to kindle the interest and provide an educational resource for the younger generations. It is also an interesting bird to be used in population count training schemes for inexperienced observers.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Madeiran spectacled warbler

Sylvia conspicillata orbitalis (Wahlberg 1854)

Subspecies Endemic to Macaronesia - Vulnerable

World Distribution

During the reproduction period it occurs in a patchy way in the Mediterranean area (Hagemeijer & Blair 1997). It occurs in the Archipelago of Madeira, the Canaries and the Cape Verde as an endemic subspecies *S.c.orbitalis*.

Identification

It is smaller than the Blackcap *S.atricapilla* and can be identified by the contrast between the grey head and white throat. It shows a considerable sexual dimorphism, with the coloration on the females duller and of a brownish colour.

Habitat

In Madeira it breeds mainly in dense shrubby areas, whether predominantly indigenous species (e.g. heather *Erica sp.*) or exotic (e.g. Peas *Genista tenera*) where there is little disturbance. On Porto Santo it occupies similar areas but it is also seen in young pine-groves *Pinus sp.*.

Conservation

Distribution in the Archipelago, population size and trend

It occurs in Madeira and Porto Santo, however, only recently has breeding been confirmed for the latter (Barone & Delgado 2001, Nunes *et al.* 2002). The total population is likely to be between 250 and 2500 individuals, distributed randomly, with areas of greater density. The population trend is believed to be stable.

Threats

No determining threats have been identified. Nevertheless, the fact that it occupies habitats in areas considered of low conservation status, thus with no legal protection, might become a major threat in the long term.

Red Data Book category

Vulnerable.
Criterion: Species with a reduced population (possibly fewer than 1000 individuals) that may occur on a restricted number of sites.

Legal Status

- Annexe II of the Birds Directive and Annexe II of the Bern Convention.
- 20 to 50 % of its area of occurrence is classified as SPA and SIC, integrating the 2000 Natura Network.
- PNM.

Conservation Measures

There are no management measures directed at this species in particular, however, because some of the areas of its habitat fall under the SPA or IBA, it is likely to benefit somehow. It is believed that the ongoing protection is appropriate to its conservation status. A scheme recently introduced will allow the adequate monitoring of the population (Nunes *et al.* 2002).

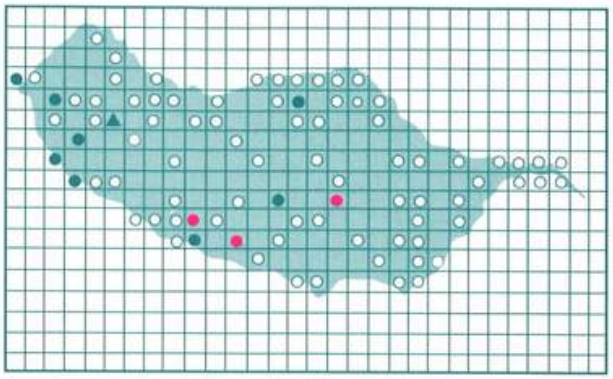
Remarks

Some authors have suggested that the population of Madeira and Porto Santo belong to an endemic subspecies *S.c.bella* (e.g. Bannerman & Bannerman 1965, Câmara 1997). For conservationist reasons, it would be important to carry out further research to clarify the situation.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



ALFREDO 85

Blackcap

Sylvia atricapilla heinecken (Jardine 1830)
Subspecies Endemic to Macaronesia - Least Concern

World Distribution

Widespread throughout most of Europe, it is one of the most abundant on that Continent (Berthold & Solenen 1997). In the Archipelagos of Madeira and the Canaries there is the subspecies *S.a.heinecken*, endemic to Macaronesia. The subspecies *S.a.gulari*, a resident of the Archipelago of Cape Verde, and *S.a.atlantis*, found in the Azores, are also endemic to Macaronesia.

Identification

The Blackcap is an unmistakable bird due to its cap: a neat black cap on the male and brownish cap on the female

Habitat

It can be seen on a wide variety of habitats, but mainly relishes dense shrubby areas. While it is seldom seen in well preserved Laurel Forests, it may be found on the fringes, in the transitional areas, where the specific richness is greater. It is rarely found above 800 meters.

Conservation

Distribution in the Archipelago, population size and trend

It is known to be a regular breeder on Madeira Island only. However, it has been seen throughout Porto Santo, and is believed to breed there also, which indicates that it is bound to be a regular resident there. The Madeira population is likely to be greater than 10000 individuals, showing a stable or positive trend.

Threats

No threat has been identified.

Red Data Book category

Least Concern.
Criteria: Population deemed to be greater than 10000 individuals with an extensive area of occurrence and distribution.

Legal Status

- Annexe II of the Birds Directive and Annexe II of the Bern Convention.
- 20 to 50% of the area of occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

There is no plan of action aimed at this species in particular. However, some of the areas of its habitat are included in the Strict or Partial Nature Reserve of PNM. The ongoing protection is in accordance with its conservation status.

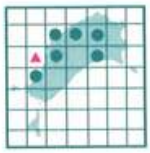
Remarks

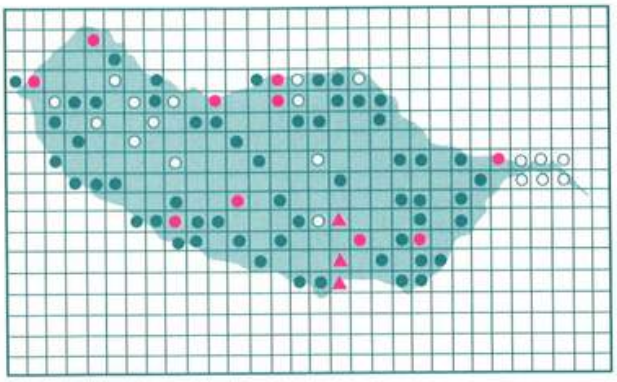
This species occurs in a melanistic form. As its name indicates these birds have a much darker coloration. This is the result of a recessive gene, hence, its occurrence is less common than the non-melanistic (Berthold *et al.* 1996).

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Madeiran firecrest

Regulus ignicapillus madeirensis (Harcourt 1851)

Endemic Subspecies - Least Concern

World Distribution

It occurs in Europe, specifically in Central Europe and the Iberian Peninsula. The Archipelago of Madeira is home to an endemic subspecies *R.i madeirensis*.

Identification

It is the smallest of all the Madeiran birds. Its size and its nervous behaviour make it an unmistakable bird.

Habitat

It occupies a wide range of habitats, from areas of indigenous and exotic forests to rural agricultural and inhabited areas. However, it relishes high areas of transitional laurel forest, where heather is abundant.

Conservation

Distribution in the Archipelago, population size and trend

This bird is regularly present only in Madeira, being very common across all the areas of its habitat. We found some in Porto Santo and Barone & Delgado (2001) refer to the existence of breeding birds, but given the available data it should be considered an occasional breeder. The population trend is positive in the three types of habitat: laurel forests, exotic forests and agricultural areas (Oliveira *et al.* 1999).

Threats

No relevant threat has been identified.

Red Data Book category

Least concern.
Criteria: Population likely to be greater than 10000 individuals, with an extensive area of occurrence and distribution.

Legal Status

- Annexe II of the Birds Directive and Annexe II of the Bern Convention.
- 20 to 80% of the area of occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

There is no action plan aimed at this species in particular. However, it occurs mainly in areas included in Strict or Partial Nature Reserves of the PNM, and is therefore well protected.

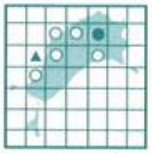
Remarks

Morphologically, it is very different from its nominal species, thus, it would be of great interest to clarify its taxonomic status. Taking into consideration its abundance and its insectivorous diet, this subspecies is likely to play an important role in regard to the indigenous forest. Again further studies should be carried out.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Spanish sparrow

Passer hispaniolensis (Temminck 1820)

Widespread distribution - Vulnerable

World Distribution

It has a patchy distribution worldwide, with *P.h.transcaspius* west of Turkey and *P.h.hispaniolensis* in the Iberian Peninsula. The latter also occurs in the Archipelagos of Madeira, the Canaries and Cape Verde.

Identification

A bird with a strong sexual dimorphism. The male has a brown head, black breast, white belly and side of neck, whereas the female has a more discreet, rather brownish overall coloration.

Habitat

The Spanish sparrow is an antrophile species which uses as its habitat the open man-made areas such as gardens and urban squares. It is seen also in agricultural areas, mainly when there are abandoned fields with vegetation cover nearby.

Conservation

Distribution in the Archipelago, population size and trend

It is a resident of Madeira and Porto Santo Islands, and its population is estimated to be between 250 and 2500 individuals. In the last 20 years there has been a dramatic decline in population, possibly as much as 30% in the last decade. The decrease affected mostly Madeira Island where, currently, the species is seldom seen. Most of the current population is in Porto Santo Island.

Threats

The determining factor that led to the decline in the population has not been identified.

Red Data Book category

Vulnerable.
Criteria: A species whose population decreased 30% or more over the last 10 years; currently it has a small population (250-2500 individuals) over a restricted area (smaller that 20km^2).

Legal Status

- Annexe III of the Bern Convention.
- Does not occur in relevant numbers in any SPA or SIC, integrating the Natura 2000 Network.
- Does not occur in relevant numbers in any protected area.

Conservation Measures

There are no management measures covering this species and its habitat does not fall under any protected area. Considering that it is a natural introduction, it would be advisable to identify the factors leading to the decline in numbers.

Remarks

Some authors suggest that the species might have been a recent introduction, probably at the beginning of last century (e.g. Bannerman & Bannerman 1965), when birds probably were brought in cages (e.g. Câmara 1997). However, taking into consideration the world distribution, and that in the Canaries the species is believed to have arrived there by its own means (Martin & Lorenzo 2001 and references mentioned therein), and finally since there is no reliable evidence that the birds of Madeira originated from caged birds, it can be stated that this bird is indigenous to the Archipelago of Madeira.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △

Rock sparrow

Petronia petronia madeirensis (Erlanger 1899)

Subspecies Endemic to Macaronesia - Vulnerable

World Distribution

Spread across Southern Europe, Northern Africa, the Middle East and Central Asia, to Eastern Manchuria. Seven subspecies are recognized (including *petronia)* and *P.p.madeirensis,* a subspecies endemic to Macaronesia, occurs In the Archipelagos of Madeira and the Canaries.

Identification

The most visible features are the "dull brownish" colour, the bands on the head and the white tipped tail.

Habitat

It is found in areas with low vegetation, ocean cliffs and farmland. It is seen mainly in low areas, however it can also be found at high elevations. Historically its habitat included humanised and urban areas.

Conservation

Distribution in the Archipelago, population size and trend

It is a resident of Madeira and Porto Santo, with a total population between 250 and 2500 individuals. Some authors refer to its breeding on the Desertas (e.g. Bannerman 1965), however this has not been confirmed in recent years. Historically it is believed to have been plentiful and much more widely distributed. In the last decade the population is thought to be stable.

Threats

Some authors (e.g. Martin & Lorenzo 2001) refer that historically competition with the Spanish sparrow accounts for the decline in population and reduction of the area of its distribution. Although this might be an acceptable explanation, there is no reliable data to confirm it. In any case, such an argument is no longer valid since the actual population of the Spanish sparrow suffered a substantial decrease, also.

Red Data Book category

Vulnerable.
Criteria: small population (250-2500 individuals) and a restricted area of occupation (under 20 km^2) being confined to a limited number of locations.

Legal Status

- Annexe II of the Bern Convention.
- 20 to 50% of its area of occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

There are no specific action plan for this species. However, its unfavourable conservation status should deserve greater attention.

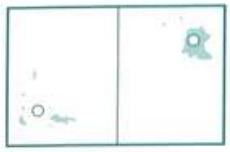
Remarks

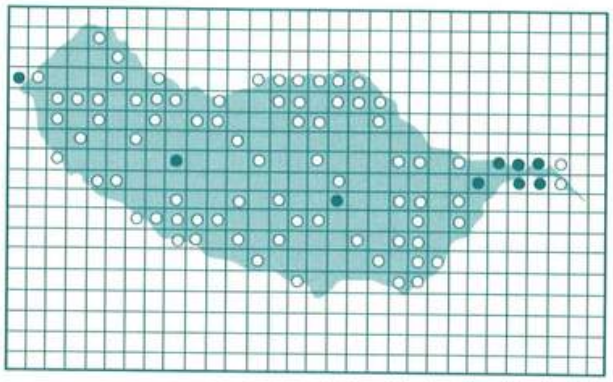
In the Canaries the species also suffered a striking decline in the population and area of distribution, simultaneous with the increase of the Spanish sparrow (Martin & Lorenzo 2001).

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Madeiran chaffinch

Fringilla coelebs madeirensis (Sharpe 1888)

Endemic Subspecies - Least Concern

World Distribution

Widely distributed across Europe. In Macaronesia there are five endemic subspecies: three on the Canaries, *F.c.canariensis*, *F.c.ombriosa* and *F.c.palmae*; one in Madeira *F.c.madeirensis;* and another in the Azores *F.c.moreletti*. One other endemic species *F.teydea* breeds in the Canaries.

Identification

It is easily identified because of it is distinctive colouring. The most conspicuous characteristics are its pinkish breast, the white wing-bar and white edges on its tail feathers. There is a striking sexual dimorphism, the females display much duller coloration, showing however, the same white bars on wings and tail.

Habitat

Mainly found in indigenous or exotic forest, it can also be seen on farmland, in rural areas and areas with shrubs or even low vegetation.

Conservation

Distribution in the Archipelago, population size and trend

It occurs only on Madeira Island where the population is greater than 10000 individuals. It can be seen across most of the island, except in low or arid areas. The population trend is believed to be stable.

Threats

No threat has been identified.

Red Data Book category

Least Concern.
Criteria: Population estimated to be greater than 10000 individuals, distributed over a widespread area.

Legal Status

- Annexe II of the Bern Convention.
- 50 to 80% of its area of occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

It is not protected by any specific action plan however, a relevant proportion of the population occurs in protected areas.

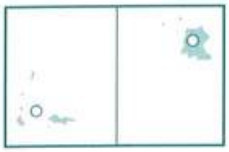
Remarks

Like the Firecrest, this subspecies shows a clear difference from the nominal species found on the European Continent. Thus, it would be important to study it further in order to determine its taxonomic status.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Canary

Serinus canaria canaria (Linnaeus 1758)

Endemic to Macaronesia - Least Concern

World Distribution

It is a species with a restricted distribution. Endemic to Macaronesia, it is a resident of the Archipelagos of Madeira, the Canaries and the Azores.

Identification

Easily identified by its yellow-coloured breast, there is a striking sexual dimorphism, the females being less brightly coloured.

Habitat

It occupies different types of habitat, more commonly rural areas with agricultural fields, open spaces with low vegetation or where the vegetation is dense. It is seen throughout the entire range of elevations of the islands where it occurs; however, the frequency declines as the altitude rises. On the Deserta Grande it is seen on inter tidal area.

Conservation

Distribution in the Archipelago, population size and trend

It is a resident of the Island of Madeira, Porto Santo and Desertas, and the total population is believed to be greater than 10000 individuals. On Madeira Island the population trend was positive during the 90s (Oliveira *et al.* 1999). Although there is no documented data for the other islands, the trend is deemed stable.

Threats

No threat has been identified.

Red Data Book category

Least Concern
Criteria: Population possibly greater than 10000 individuals, which occur and are distributed across a widespread area.

Legal Status

- Annexe III of the Bern Convention.
- <20% of its area of occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- Nature Reserve of Ilhas Desertas and PNM.

Conservation Measures

There is no specific action plan aimed at the species, however the ongoing protection is appropriate to its conservation status. On the Desertas its habitat is included in areas of Strict Nature Reserve.

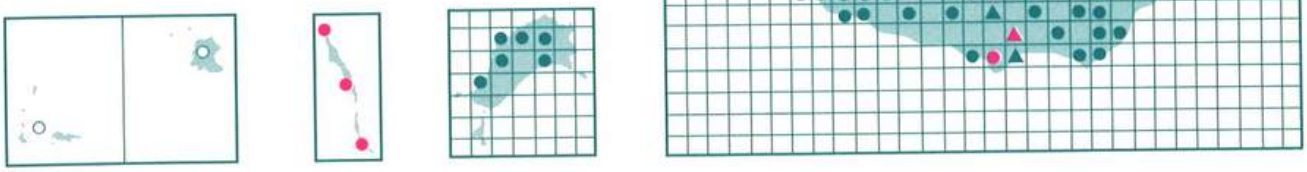
Remarks

On the Deserta Grande there was a sharp decline of the population in 1996, when the project for the eradication of herbivores was carried out. However, the population has now recovered.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △



Greenfinch

Carduelis chloris aurantiiventri (Cabanis 1850)

Widespread Distribution - Least Concern

World Distribution

A widespread resident throughout Europe. In the Archipelago of Madeira it is represented by a subspecies, *C.c.aurantiiventri* which also occurs on the European Continent. It was introduced in the Azores (Newton 1997), and other remote places, namely New Zealand, Southern Australia, Argentina, Uruguay (Martin & Lorenzo 2001).

Identification

It can be identified by its greenish-yellow colouring and by the robust bill. The species show a sexual dimorphism, the colouring of the female being much less conspicuous.

Habitat

It relishes areas of exotic forests, areas of transitional forest near farmland and/or open areas covered in patchy scrub. It can also be seen in urban centres, such as Funchal, for example.

Conservation

Distribution in the Archipelago, population size and trend

It occurs solely on Madeira, where breeding was confirmed only towards the 60s (Zino 1969). Although historically it was considered very rare, the work carried out in the making of this book proved that the situation is entirely different. In fact it has a widespread distribution, with a population of more than 2500 individuals. Nothing is known about the recent population trends. However, according to previous references (e.g. Bannerman & Bannerman 1965), in the last two decades the population has increased substantially.

Threats

No threat has been identified.

Red Data Book category

Least Concern.
Criteria: Population likely to be greater than 10000 individuals, distributed over a widespread area.

Legal Status

- Annexe II of the Bern Convention.
- Its occurrence in any of the SPA and SIC, integrating the Natura 2000 Network, is scarce.
- Its presence in any protected area is not relevant.

Conservation Measures

There is no specific action plan aimed at the species nor is its habitat included in protected areas. Further studies should be carried out to determine its distribution, population trends and limiting factors.

Remarks

Apparently it is a recent natural introduction, which is spreading to new areas. Martin & Lorenzo (2001) contend that because it is a migratory species, the Atlantic populations are natural and not subject to human intervention.

Goldfinch

Carduelis carduelis parva (Tschusi 1901)

Widespread Distribution - Least concern

World Distribution

Widespread across Europe, in the Archipelago of Madeira it is represented by the Macaronesean subspecies *C.c.parva*, which is also seen in the Canaries, Azores and Cape Verde. In the last two archipelagos it was introduced (Bannerman & Bannerman 1963,1965).

Identification

It is unmistakable with its red, white and black cap.

Habitat

It occupies different types of habitats, favouring cultivated areas and areas with low vegetation where gramineous species proliferate. It can, however occur in patchy exotic or degraded indigenous forest and gardens. There are great fluctuations in the numbers of birds observed, due to the seasonal nature of their habitat use.

Conservation

Distribution in the Archipelago, population size and trend

It is a resident of Madeira and Porto Santo, but only in 2000 was breeding confirmed for the Island of Porto Santo. The actual population is estimated to be between 2500 and 10000 individuals. During the 90s the population trend was positive (Oliveira *et al.* 1999), and the situation is believed to remain steady.

Threats

In the past, capture in cages was very common, which was probably a limiting factor. Now such a practice no longer exists and no other threat has been identified.

Red Data Book category

Least Concern.
Criteria: Population between 2500 and 10000 individuals, distributed over a widespread area.

Legal Status

- Annexe II of the Bern Convention.
- <20% of its occurrence is classified as SPA and SIC, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

There is no specific action plan aimed at the species, however, the ongoing protection is appropriate to its conservation status.

Remarks

According to Bannerman & Bannerman (1963) the population of the Azores might have originated from an introduction of the Madeiran species.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △

Linnet

Carduelis cannabina guentheri (Wolters 1953)

Subspecies Endemic to Madeira Archipelago - Least Concern

World Distribution

It has a very widespread distribution, and five subspecies have been described (including the nominal). The endemic subspecies *C.c.guentheri* is found in the Archipelago of Madeira and *C.c.meadewaldoi* and *C.c.harterti* are found in the Canaries.

Identification

The males display a reddish breast which makes them conspicuous. The females are not so easily identified, as they show no patch.

Habitat

It favours open areas where there is a proliferation of gramineous plants and some shrubs. It also occurs frequently in agricultural areas, and can sometimes be seen in gardens and humanised places.

Conservation

Distribution in the Archipelago, population size and trend

It is a resident of the islands of Madeira and Porto Santo. Although some authors (e.g. Bannerman & Bannerman 1965, Câmara 1997) have documented their breeding on the Desertas, it was not confirmed in our research nor has it been seen regularly during the last decade. Historically, it was becoming rarer and rarer, but currently there is evidence that the situation is likely to be reversing (D. Câmara *in litt.*).

Threats

No threat has been identified.

Red Data Book category

Least Concern.
Criteria: Population between 2500 and 10000 individuals, distributed throughout a widespread area.

Legal Status

- Annexe II of the Bern Convention.
- <20% of its occurrence in is classified as SPA and SIC, integrating the Natura 2000 Network.
- PNM.

Conservation Measures

There are no specific action plan designed for this species. It would be worthwhile to carry out further studies to assess whether the ongoing protection is appropriate to its conservation status. A monitoring scheme should also be introduced to enable determine the current population trends.

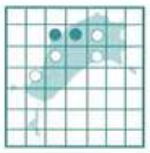
Remarks

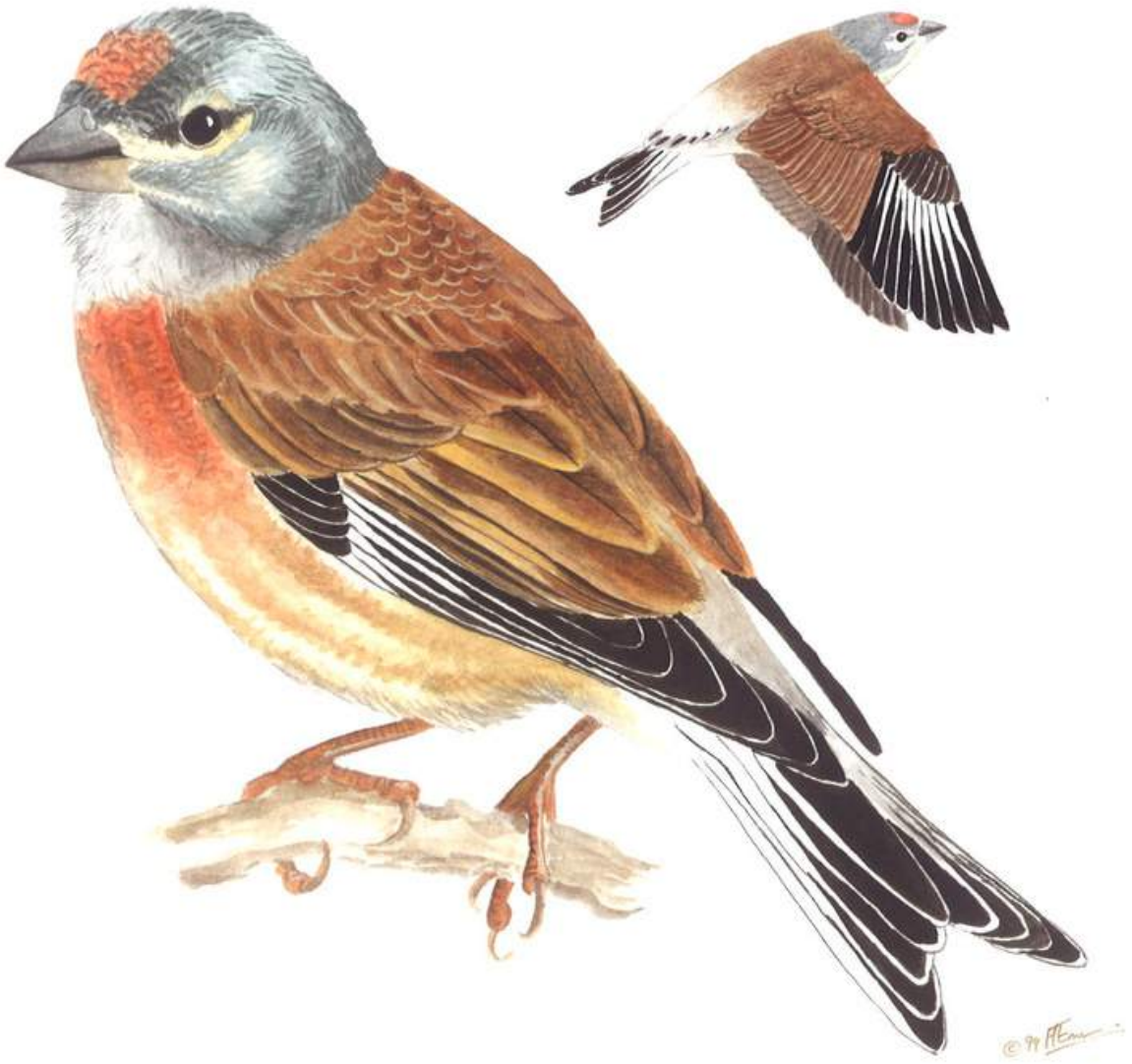
It is a bird that seldom forms monospecific flocks, frequently mixing with the Canaries and Goldfinches.

Systematic visits
Not present ○
Possible breeding ●
Breeding confirmed ●

Casual observations
Possible breeding ▲
Breeding confirmed ▲

No recent data exists △





Dactylorhiza foliosa - Orquidea da serra

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List Recommended Internet Sites

www.sra.pt
Home page of Secretaria Regional do Ambiente e dos Recursos Naturais.

www.pnm.pt
Home page of Serviço do Parque Natural da Madeira.

www.icn.pt
Home page of Instituto da Conservação da Natureza.

www.icn.pt/documentos/Livro_Vermelho/Classif_Aves_Madeira.pdf
Bird Species of Madeira listed at the Portuguese Red List Book.

http://europa.eu.int/comm/environment/nature/home.htm
European Commission site concerning environmental and nature conservation policies and legislation, namely Nature 2000 network, Bird Directive and Habitat Directive.

www.natura2000benefits.org
Online leaflet Natura 2000, the European network for nature and people.

http://conventions.coe.int/treaty/en/Treaties/Html/104.htm
European Council site concerning the Bern Convention .

www.redlist.org/
IUCN site concerning the Red List of threatened species.

www.cites.org/
CITES home page.

www.cms.int/
Bonn Convention home page.

www.spea.pt/
Home page of the Sociedade Portuguesa para o Estudo das Aves

www.birdlife.net/
Birdlife International home page.

www.bou.org.uk
Home page of the Bristish Ornithologists Union.

www.fauna-flora.org
Home page of Fauna and Flora International

www.pbs.org/lifeofbirds/
PBS site concerning the Life of Birds, as presented by David Attenborough.

www.maurinet.com/
Home page of the Mauritian Wildlife Foundation, where several conservation projects are presented.

http://darwin.bio.uci.edu/~sustain/bio65/Titlpage.htm
Online book Biodiversity and Conservation by Peter J. Bryant. Chapter 12c talks about the conservation of island species.

www.nmnh.si.edu/birdnet/
General ornithological site presented by the Ornithological Council.

www.salomonsports.com
Salomon home page.

Annexes

Annexe I

The IUCN Red List Categories

The assessment of the Conservation Status of the species under consideration has been made in accordance with the criteria and categories recommended by the IUCN, used in the Red List of the Vertebrates of Portugal (www.icn.pt).

For detailed information consult www.redlist.org.

Categories	Abbreviation	Definition
Critically endangered	CR	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.
Endangered	EN	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.
Vulnerable	VU	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.
Least concern	LC	A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.
Data Deficient	DD	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

Annexe II Summary table

Species	Distribution				Taxonomic status		Red book	Legal protection				
	M.	P.S	D.	S.	Mac. End.	Mac. End.		BD	BC	SPA	SIC	PA
P. madeira	x				x		EN	x	x	x	x	x
P.feae			x			x	VU	x	x	x	x	x
B.bulwerii	x	x	x	x			LC	x	x	x	x	x
C.diomedea	x	x	x	x			LC	x	x	x	x	x
P.puffinus	x						VU		x	x	x	x
P.assimilis baroli	x	x	x	x		(x)	VU	x	x	x	x	x
P.marina hypoleuca				x		(x)	VU	x	x	x	x	x
O.castro	x	x	x	x			LC	x	x	x	x	x
A.nisus granti	x					(x)	LC		x	x	x	x
B.buteo harterti	x	x			(x)		LC		x	x	x	x
F.tinnunculus canariensis	x	x				(x)	LC		x	x	x	x
A. rufa	x	x					---	x	x	x	x	x
C.coturnix confisa	x	x			(x)		LC	x	x	x	x	x
Gallinula chloropus	x	x					CR		x			
C. alexandrinus		x					CR		x			
S.rusticola	x						VU	x	x	x	x	x
L.cachinnans atlantis	x	x	x	x		(x)	LC		x	x	x	x
S. hirundo	x	x	x	x			VU	x	x	x	x	x
C. livia atlantis	x	x				(x)	DD		x	x	x	x
C. trocaz	x				x		VU	x	x	x	x	x
T. alba schmitzi	x	x					LC		x	x	x	x
A.pallidus	x	x					DD		x	x	x	x
A.unicolor	x	x				x	LC		x	x	x	x
U.epops		x					VU		x	x	x	x
A. bertheloti madeirensis	x	x	x			x	LC		x	x	x	x
A. bertheloti bertheloti				x		x	VU		x	x	x	x
M. cinerea schmitzi	x				(x)		LC		x	x	x	x
E. rubecula	x						LC		x	x	x	x
T.merula cabrerae	x					(x)	LC	x	x	x	x	x
S. conspicilata orbitalis	x	x				(x)	VU	x	x	x	x	x
S. atricapilla heineken	x	x?				(x)	LC	x	x	x	x	x
R. ignicapillus madeirensis	x				(x)		LC	x	x	x	x	x
P.hispaniolensis	x	x					VU		x			
P.petronia madeirensis	x	x			(x)		VU		x	x	x	x
F. coelebs madeirensis	x				(x)		LC		x	x	x	x
S.canaria canaria	x	x	x			x	LC		x	x	x	x
C.chloris	x						LC		x			
C. carduelis	x						LC		x	x	x	x
C. cannabina guentheri	x	x			(x)		LC		x	x	x	x
38	35	24	9	8	2 (7)	4 (9)		16	38	34	34	34

Note:
(x) - concerns the subspecies;
BD - Bird Directive;
BC - Bern Convention.

Annexe III

List of Regular Wintering Species

Some migratory species seek areas with a milder climate to spend the winter. The Archipelago of Madeira, lying outside the migratory routes normally used by species whose annual cycle is divided between Europe and Africa, does not register very significant populations of wintering birds. However, some species are sighted regularly during the winter months. Information on this point is very scarce, but the following list is given, showing species whose presence has been confirmed in consecutive winters over the last five years. The data is conditioned by the small number of observers in the region who have an interest in recording the wintering species.

Specie	mature individuals observed
Egretta garzetta	>50;<250
Ardea Cinerea	>1;<250
Fulica atra	>1; <50
Vanellus vanellus	>1; <50
Calidris alpina	>1; <50
Numenius phaeopus	>1;<250
Actitis hypoleucus	>1;<250
Arenaria interpres	>1;<250
Larus ridibundus	>1;<250
Larus fuscus	>1; <50
Alauda arvensis	>1; <50

Ranunculus cortusifolius - Ranunculos

Dília Menezes

Biologist with the Madeira Nature Park, is 31 years of age. Her natural intellectual curiosity in wishing to understand *what lies beyond* made her hesitate between following a career in the area of physiology and the area of ecology within the scope of conservation.

Led by the appeal of work in the outdoors she chose the later and she is at present leading a conservation project on Europe's most threatened bird: the *Madeira's petrel*. She has several scientific and technical publications.

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Paulo Oliveira

Biologist with the Madeira Natural Park, is 39 years of age and holds a doctorate taken in the UK. From a very young age he felt that he could only fulfil his personal goals working outdoors and in direct contact with Nature.

At present his interests are focussed on carrying out projects on species and habitat recovery on remote islands. He has several scientific and technical publications, including the book "Management and Conservation of the Birds of the Madeira Archipelago" 1999.

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This book presents unpublished data about the ecology and conservation of the breeding birds of Madeira. To a certain extent, it may be considered the second part of the book "Management and Conservation of the Birds of the Madeira Archipelago", about which was said that "it is definite recommended reading for any ornithologist, naturalist or any person interested in the avifauna of the Archipelagos of Macaronesia" (Bulletin of the Friends of the Tenerife Museum of Natural Sciences Association").

S. R.

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