



Background Document for
Balearic shearwater (*Puffinus mauretanicus*)



OSPAR Convention

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the “OSPAR Convention”) was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. It has been ratified by Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom and approved by the European Community and Spain.

Convention OSPAR

La Convention pour la protection du milieu marin de l'Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d'Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. La Convention a été ratifiée par l'Allemagne, la Belgique, le Danemark, la Finlande, la France, l'Irlande, l'Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d'Irlande du Nord, la Suède et la Suisse et approuvée par la Communauté européenne et l'Espagne.

Acknowledgement

This report has been prepared by Dr Nigel Varty and Ms Kate Tanner for BirdLife International as lead party for the Balearic shearwater.

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Background Document for Balearic shearwater *Puffinus mauretanicus*

Executive Summary

This background document on Balearic shearwater (*Puffinus mauretanicus*) has been developed by OSPAR following the inclusion of this species on the OSPAR List of threatened and/or declining species and habitats. The document provides a compilation of the reviews and assessments that have been prepared concerning this species since the agreement to include it in the OSPAR List in 2008. The original evaluation used to justify the inclusion of *P.mauretanicus* in the OSPAR List is followed by an assessment of the most recent information on its status (distribution, population, condition) and key threats prepared during 2008-2009. Chapter 7 provides recommendations for the actions and measures that could be taken to improve the conservation status of the species. On the basis of these recommendations, OSPAR will continue its work to ensure the protection of *P.mauretanicus*, where necessary in cooperation with other organisations. This document may be updated to reflect further developments.

Récapitulatif

Le présent document de fond sur le *Puffin de Baléares* a été élaboré par OSPAR à la suite de l'inclusion de cette espèce dans la liste OSPAR des espèces et habitats menacés et/ou en déclin. Ce document comporte une compilation des revues et des évaluations concernant cette espèce qui ont été préparées depuis qu'il a été convenu de l'inclure dans la Liste OSPAR en 2008. L'évaluation d'origine permettant de justifier l'inclusion du *Puffin des Baléares* dans la Liste OSPAR est suivie d'une évaluation des informations les plus récentes sur son statut (distribution, population, condition) et des menaces clés, préparée en 2008-2009. Le chapitre 7 recommande des actions et mesures à prendre éventuellement afin d'améliorer l'état de conservation de l'espèce. OSPAR poursuivra ses travaux, en se fondant sur ces recommandations, afin de s'assurer de la protection du *Puffin des Baléares*, le cas échéant en coopération avec d'autres organisations. Le présent document pourra être actualisé pour tenir compte de nouvelles avancées.

1. Background Information

Name of species

Puffinus mauretanicus Balearic shearwater.¹

Ecology and breeding biology

P.mauretanicus breeds in the small islands and coastal areas of the Balearic Islands (outside the OSPAR area). It is a nocturnal, cave/burrow nesting species which feeds on small pelagic fish such as pilchard *Sardina pilchardus* and anchovy *Engraulis encrasicolus*.

¹ *P.mauretanicus* was first treated as a subspecies of *P.puffinus* and later as *P.yelkouan* (in agreement with Heath and Evans, 2000).

2. Original evaluation against the Texel-Faial selection criteria

List of OSPAR Regions and Dinter biogeographic zones where the species occurs

OSPAR Regions II, III, IV, V

Dinter biogeographic zones: Warm-temperate waters, Cold-temperate waters, Warm-temperate pelagic waters, Lusitanian (Cold/Warm) , Lusitanian-boreal, Cold-temperate pelagic waters, Boreal-lusitanian, Boreal, Norwegian Coast (Westnorwegian)

List of OSPAR Regions and Dinter biogeographic zones where the species is under threat and/or in decline

All where it occurs.

Original evaluation against the Texel-Faial criteria for which the species was included on the OSPAR List

P. mauretanicus was nominated for inclusion on the OSPAR List with particular reference to the global importance, rarity, decline, and sensitivity criteria, with information also provided on threats, and listed by OSPAR 2008.

Global/regional importance. Although the species' breeding colonies and main wintering grounds are in the Mediterranean, the majority of the global population disperses into the OSPAR Maritime Area during the post-breeding period, mostly along the coasts of Portugal, south-western and north-western Spain, western France and southern/western Britain and Ireland (Le Mao and Yésou, 1993). Hence, the OSPAR area was considered of global importance for the species during the summer and early autumn months (particularly June to October).

Rarity. At the time of listing, the global breeding population of this species was considered small, with a total global population – including a significant number of 'floating' non-breeding birds – estimated to be in the region of 10 000 individuals (Wynn and Yésou, 2007).

Decline. At the time of listing, there was good evidence of a significant and rapid decline in the breeding population of the species, with the species facing a very high risk of extinction and classified as Critically Endangered (Arcos and Oro, 2004; IUCN, 2007).

Sensitivity. This species was considered to have a very low *resistance*, due to its very small breeding range (<10 km²) and nesting behaviour, making it susceptible to predation by introduced mammals, habitat loss and degradation and disturbance (Aguilar, 1999; Arcos and Oro, 2004). Away from the breeding colonies, the species' tendency to congregate in large numbers in coastal waters, often near harbours, makes it vulnerable to oil spills, particularly in the moulting quarters (Aguilar, 1999; Mayol-Serra *et al.*, 2000), and its tendency to aggregate in the most productive waters (Louzao *et al.*, 2006a), also make the species susceptible to interactions with commercial fisheries, e.g. by-catch on longlines (Arcos *et al.*, 2008). It was also viewed to have very low *resilience* as birds do not breed until at least their third year, are long-lived, and reproduce slowly (adults are known to skip breeding some years), and hence were considered very sensitive to human activities which increase adult mortality, such as longline fishing (Aguilar, 1999; Arcos and Oro, 2004; Oro *et al.*, 2004).

Threats. The original listing notes that the species faced threats at its breeding grounds from predation, (former) harvesting, coastal development (with associated light pollution), inter-specific competition for nest cavities, and possible hybridisation with Yelkouan shearwaters *P. yelkouan*. Away from the breeding colonies and into the OSPAR Area, marine pollution and incidental capture by commercial fisheries were identified as the main threats directly linked to human activities.

3. Current status of the species

Distribution in OSPAR maritime area

This species breeds only in the Balearic Islands, where it nests on the small islands and coastal areas of Formentera, Ibiza, Mallorca, Cabrera and Menorca (Arcos and Oro, 2003; Ruiz and Marti, 2004). During the breeding season (February - June), the species forages mainly along the eastern Iberian coast, with the largest concentrations occurring off the Ebro Delta and the Cape Nao areas (Louzao *et al.*, 2006a).

After the breeding season, between late May and the end of July, the majority of the global population passes through the Strait of Gibraltar (peaks in June) and into the Atlantic², dispersing northwards along the coasts of Portugal and north-western Spain to post-breeding grounds in the Bay of Biscay and Iberian coast (OSPAR Region IV), where they undergo their annual flight-feather moult (Mayol-Serra *et al.*, 2000). This coincides with the spawning of small pelagic fish in these areas (see Le Mao and Yésou, 1993 for details). Concentrations of several hundred birds are regularly recorded along the coasts of Portugal and Galicia (Mayol-Serra *et al.*, 2000; Mouriño *et al.*, 2003; Poot, 2005), and several thousand birds congregate along the French coast of northern Biscay, particularly off Vendée and in the Mor-Braz area, north of the Loire Estuary (Le Mao and Yésou, 1993). Although the species has long been a regular visitor to the western English Channel and, to a lesser extent, the North and Celtic Seas (Mayol-Serra *et al.*, 2000), there is increasing evidence for a northwards shift in its core post-breeding range, which has been suggested as an indirect result of changes in sea surface temperatures (Wynn and Yésou, 2007; Wynn *et al.*, 2007)³.

Most individuals return to the Mediterranean in the autumn, with return passage beginning in September and peaking in October – November, although late individuals are still recorded passing through the Strait of Gibraltar between December and April (Mayol-Serra *et al.*, 2000). Large gatherings of birds winter off the coast of eastern Spain, although some birds remain to over-winter in the Atlantic (recorded off south-west UK, in the Bay of Biscay, Portugal, the Gulf of Cadiz, and off the coast of Morocco)⁴.

There is a risk of large-scale changes in the distribution of the species if the population continues to decline towards extinction (see below), and there could be further changes in the northward extension of its post-breeding range in the Atlantic, especially if this is related to climate change impacts. As the

² A few birds remain in the Mediterranean and Alboran seas during the post-breeding time (ICES, 2007).

³ The suggested driving mechanism has been questioned, and alternative causal factors have been proposed (e.g. changes in fishing practices) for the apparent northward shift in the distribution of *P.mauretanicus* (Votier *et al.*, 2008). It has also been posited that the increase of observations in NW Europe could be largely due to observer bias, since the main increase in UK and NW Europe coincided with the split of the Balearic shearwater from the Manx shearwater, resulting in more attention from observers (Votier *et al.*, 2008). However, new datasets that have come to light since 2007 reinforce the view that the species is continuing to expand its distribution northwards. For example, consistent observations at Strumble Head in south-west Wales have been carried out from 1984 onwards, and the data quality is such that average hourly rates can be calculated for the period from July to November each year. The data indicate that 2006 and 2007 saw the highest rate for *P. mauretanicus* of birds per hour passing the watchpoint during the entire 25-year survey period. Moreover, effort based data collected as part of SeaWatch SW confirmed the presence of more than 1000 birds off south-west UK in July-October 2007 (Russell Wynn, *in litt.*, 2008).

⁴ Data collected through the SeaWatch SW project have also revealed that increasing numbers of birds are now wintering off south-west UK. It seems likely that in some winters over 1000 birds are now remaining in north-east Atlantic waters, with potentially much higher (and increasing) numbers (Russell Wynn, *in litt.*, 2008).

species makes extensive use of trawling discards, fisheries are an important factor governing the at-sea distribution of this species.

Population (current/trends/future prospects)

The breeding population of the Balearic shearwater was last estimated in 2007 at a minimum of 2135 - 2185 pairs (DGCAPEA, 2007). An estimate in 2005, based on surveys carried out between 2000 – 2005, gave 2000 – 2400 breeding pairs at 24 colonies (Rodríguez Molina and McMinn Grivé, 2005; Viada, 2006). Other estimates for the last two decades are shown in Table 1, and suggest a declining population trend.

Table 1. Estimates of the Balearic shearwater breeding population in the last two decades⁵.

Year	Estimate (breeding pairs)	Source
2007	>2 135 - 2185	DGCAPEA (2007)
2005	c.2400	Rodríguez-Molina & McMinn-Grivé (2005), DGCAPEA (2005)
2001	1750 - 2125	Ruiz & Martí (2004)
1999	2190 - 4256	Ruiz & Martí (2004)
early 1990s	c. 3300 (2083 - 4114)	Aguilar (1997), Ruiz & Martí (2004)

The total global population – including a significant number of ‘floating’ non-breeding birds – was speculatively estimated to be in the region of 10 000 individuals (e.g. Rodríguez Molina and McMinn Grivé, 2005). However, results from boat-based line transect surveys covering the whole Mediterranean shelf of the Iberian Peninsula, during the pre-breeding period (Nov - Dec), suggest that the area holds 25 000 - 30 000 individuals at that time. This is a substantially larger figure than that predicted from a breeding population of less than 2500 pairs, which would not be expected to exceed 10 000 - 15 000 individuals accounting for non-breeders (Arcos, 2008). In addition, in 2007, land-based counts of migration through the Straits of Gibraltar gave a figure of 12 270 birds leaving the Mediterranean from 23 May to 9 July in 222.5 hours of observation (35% of total light time), which produced a conservative estimate of c. 25 000 birds migrating through the Strait (Arroyo *et al.*, 2008)⁶. Consequently, there is some uncertainty in the estimates of population size, but the true figure is likely to be in the range of 18 000 to over 25 000 individuals.

Trends based on comparisons of breeding population estimates over time may be confounded by differing survey methodologies and effort, and are therefore of questionable reliability. Nevertheless, several breeding colonies on Cabrera and Formentera have disappeared completely in the last few decades, and numbers at long-term monitoring sites have also declined (Mayol-Serra *et al.*, 2000; Oro *et al.*, 2004; Rodríguez Molina and McMinn Grivé, 2005; Viada, 2006). For instance, 685 pairs were recorded on Formentera in 2007 (DGCAPEA 2007) compared to almost 1000 pairs in 2001 (Ruiz and Martí 2004). Inter-annual variability in the availability of small pelagic fish was found to have an influence on the species’ overall breeding performance, but current values of breeding success fail to explain the sharp decline of the species in the Mediterranean (Louzao *et al.*, 2006b).

At-sea censuses have similarly shown declines, with numbers wintering off the coast of north-eastern Spain declining from 10,000–11,000 birds in the early 1990s to just over 5,000 individuals during the winter of 2002–2003 (Gutiérrez, 2003). Similar reductions have been observed within the OSPAR area in the traditional post-breeding quarters off western France, where 8000 – 10 000 individuals were regularly recorded in the 1980s, compared to no more than half this number during surveys in 1999 – 2000 (Yésou, 2003). Although this decline may in part be explained by changes in the species’ post-

⁵ Pep Arcos *in litt.* (2008).

⁶ A more intensive monitoring program in 2008 revealed a net flux of >18 000 birds into the Atlantic, with 65% of the 15 May-15 July period covered. http://www.fundacionmigres.org/pardela_balear08.html

breeding distribution (see above), the increasing number of individuals recorded further north in recent years does not compensate for the birds 'missing' from the Bay of Biscay (Yésou, 2003; Wynn and Yésou, 2007). While the recorded rates of decline in these at-sea concentrations do not reach the dramatic levels suggested by Oro *et al.* (2004), they represent significant reductions in numbers, and are cause for concern.

One study suggested that the population was declining by an average of 7.4% per year, and mean extinction time for the global breeding population (calculated using population viability analysis) was estimated at just over 40 years (Oro *et al.*, 2004)⁷. Consequently, there is a risk of large-scale changes in population size and the potential for extinction of the species within 50 years, unless the factors causing the decline are addressed.

Condition (current/trends/future prospects)

Estimates of adult survival based on capture–recapture data for 374 individuals ringed during 1997 – 2002 at two focal colonies in Mallorca (0.78 ± 0.03) are unusually low for a procellariiform (Oro *et al.*, 2004)⁸. Since both colonies were free of mammalian predators, the low adult survival between years is likely to be a consequence of at-sea mortality away from the colonies (Oro *et al.*, 2004).

Limitations in knowledge

Availability of information for this species within its breeding range is high as it is restricted to the islands of the Balearics. However, information is less available for the species within the OSPAR area, and at-sea threats are not well understood. Further studies are required to clarify the extent to which the changes in the numbers and distribution of birds in the Atlantic, particularly in the Bay of Biscay, off north-east Spain and in UK and Irish waters, are the consequence of an overall population decline and/or other factors such as changes in prey distribution and climate change.

Accurately assessing breeding numbers of nocturnal, cave-nesting species can be difficult. In addition, the species is apparently prone to changing its favoured non-breeding quarters over relatively short periods of time in response to fluctuating prey densities (Gutiérrez and Figuerola, 1995; Mayol-Serra *et al.* 2000). Accurately estimating global population size of shearwaters is difficult. Consequently, the current very broad estimate of between 18 000 and >25 000 birds should be treated as a crude figure. Assessing population trends should also be undertaken with care, as to have validity they need to have a standard methodology and constant effort, and for coastal counts of shearwaters for instance, observers need to be equally proficient in identification. For *P.mauretanicus* adequate counts from Gibraltar would be the most reliable, as all birds entering the OSPAR area (presumably most of the global population) are forced to pass through the Strait.

4. Evaluation of threats and impacts

Predation by introduced mammals, both of eggs and chicks by rats, and of adults by domestic cats and mustelids, are significant threats at some breeding colonies (Mayol-Serra *et al.*, 2000; Ruiz and Martí, 2004; Arcos and Oro, 2004). Harvesting of the species for human consumption was historically a major threat, but is now of lesser concern (Aguilar, 1999). Development of its coastal habitat, e.g. for tourism, has reduced the number of suitable nesting areas, with the species probably now occupying sub-optimal sites (Aguilar, 1999). The potential impact of competition with Cory's shearwaters *Calonectris diomedea* for nest cavities is unclear (Aguilar, 1999), and needs to be determined. The use of lights for certain fishing practices, leisure craft and urban lighting near colonies may disturb

⁷ An extinction risk of more than 50% within three generations.

⁸ Given the narrow confidence limits this estimate is likely to be robust.

breeding birds and fledglings (Aguilar, 1999; Gutiérrez, 2003; Ruiz and Martí, 2004). The occurrence of Yelkouan shearwaters *P.yelkouan* in Menorca has raised concerns that hybridisation with this closely-related species may occur (Genovart *et al.*, 2005), although any genetic impact from this is not currently believed to be a threat (Genovart *et al.*, 2007).

Away from the breeding colonies, the species also faces a number of at-sea threats in the Mediterranean and the Atlantic. Over-exploitation and changes in the distribution of its fish prey is a potentially increasing threat (Aguilar, 1999; Arcos and Oro, 2004; Louzao *et al.*, 2006b; Arcos *et al.*, 2008). In the OSPAR area, the dramatic decline and local disappearance of pilchard *Sardina pilchardus* and anchovy *Engraulis encrasicolus* populations in the Bay of Biscay – probably as a consequence of recent increases in sea temperature – are strongly implicated in the coincident decline in *P.mauretanicus* numbers in the area (Mayol-Serra *et al.*, 2000; Yésou, 2003; Wynn *et al.*, 2007). The resulting increase in dispersal range and/or decrease in foraging success in the summering quarters may be having an impact on the species' survival (Mayol-Serra *et al.*, 2000; Wynn *et al.*, 2007). In addition to small pelagics, the species makes extensive use of trawling discards, which represent over 40% of its energy requirements⁹ during the breeding season (Arcos and Oro, 2002); the importance of fishery discards for the species – with a potential increase in response to the decline in traditional prey species – means that it may also be adversely affected by incoming fishing policies directed at reducing discard rates (Arcos and Oro, 2002; Arcos and Oro, 2004; Louzao *et al.*, 2006b). Although the species appears to be less prone to accidental by-catch on longlines and in fishing nets than *C.diomedea* (Aguilar, 1999; Belda and Sánchez, 2001), recent evidence shows that its congregatory behaviour and close association with fishing vessels can result in occasional instances of 'mass mortality' if large rafts of birds are present (Arcos and Oro, 2004; Ruiz and Martí, 2004; ICES, 2008). Their congregatory behaviour could also make them susceptible to injury by offshore windfarms. These events could be difficult to detect in a standard monitoring programme, given their occasional nature, but could have a high impact on the *P.mauretanicus* population (Arcos *et al.*, 2008). Incidental longline by-catch of *P.mauretanicus* is estimated to be in the hundreds of birds in the Western Mediterranean (ICES 2008, Table 3.5). The species' tendency to congregate in coastal waters (up to 5000 birds recorded: Le Mao and Yésou, 1993; Gutiérrez and Figuerola, 1995) and near important harbours – most notably during its post-breeding moult in OSPAR waters – makes the potential threat from oil pollution very significant (Aguilar, 1999; Mayol-Serra *et al.*, 2000). The sinking of the tanker *Erika* off Brittany in 1999, the wreck of the *Prestige* off Galicia in 2002 and the beaching of the *MSC Napoli* off south-west England in 2007 all occurred in important areas for the species (Mayol-Serra *et al.*, 2000; Gutiérrez, 2003; Ruiz and Martí, 2004; Wynn and Yésou, 2007). The impact on the species of other forms of chemical pollution, such as its accumulation of unusually high levels of mercury (Ruiz and Martí, 2004; Oro *et al.*, 2008), is a potential threat - the effects of which remain unquantified (Arcos *et al.*, 2008). Poisoning by toxic phytoplankton may be a threat in some feeding areas, particularly the Mor-Braz area, north of the Loire estuary in France (Mayol-Serra *et al.*, 2000; Gutiérrez, 2007). Overall, the threats facing the species in the OSPAR area are likely to be having a significant impact on its overall population.

5. Existing Management measures

The species is listed (as *Puffinus puffinus mauretanicus*) on Annex I of the EU Birds Directive, 79/409/EEC. In November 2005, the species was added to Appendix I of the Convention on Migratory Species by the Eighth Conference of the Parties¹⁰. It has a SPEC Category I rating (species of global

⁹ The species feeds mostly on small shoaling pelagic fish, particularly clupeids and engraulids (Le Mao and Yésou, 1993; Arcos and Oro, 2002; Louzao *et al.*, 2006b).

¹⁰ The CMS listing compels signatory parties to facilitate concerted international action.

conservation concern) and the species is currently listed as 'Critically Endangered' on the IUCN Red List (IUCN, 2007).

In 2000, the species was listed as 'in Danger of Extinction' in the Spanish National Catalogue of Threatened Species (Ruiz and Martí, 2004) which entails the establishment of specific Recovery Plans (under Law 42/2007: Annex IV). *P.mauretanicus* is also covered by regional legislation and listed as Endangered within the Galician Catalogue of Threatened Species (Decree 82/2007, of 9 May), and under Cataluña Category A (Law 12/2006) (Javier Pantoja *in litt.* 2008). In France, the species is included in the '*Liste des espèces d'oiseaux protégées en France en application de l'article L. 411-1 du code de l'environnement et de la directive 79/409 du 2 avril 1979 concernant la conservation des oiseaux sauvages*' which is based on the '*Arrêté du 17 avril 1981 fixant les listes des oiseaux protégés sur l'ensemble du territoire*' (Journal Officiel 19-05-1981 p. NC 4758-4760) and modified by the '*Arrêté du 29 juillet 2005*' (Bernard Cadiou *in litt.* 2008).¹¹ In Portugal, the species is protected under '*D.L. 140/99 de 24 de Abril rectificado pelo D.L. 49/2005 de 24 de Fevereiro*' and under the government's commitment to the CMS under '*Resolução da Assembleia da República n.o 69/2003: Aprova o Acordo para a Conservação das Aves Aquáticas Migradoras Afro-Euroasiáticas, concluído na Haia em 15 de Agosto de 1996*'.

In 1999, a Species Action Plan was prepared for the European Commission by BirdLife International (Aguilar, 1999). An EU LIFE Nature project "Recovery Plan for *Puffinus mauretanicus* in the SPA network of the Balearic Islands", carried out between 1998 – 2001, resulted in a number of conservation actions for the species, including the development of the first Recovery Plan (Ruiz and Martí, 2004). A second Recovery Plan for the species in the Balearic Islands, covering the period 2004 – 2010, was formally approved in July 2004 (by Decreto 65/2004), and both the Spanish national Government and regional Government of the Balearics have adopted a National Strategy for the Conservation of the Balearic Shearwater (Anon., 2005). In addition, SEO/BirdLife has been nominated as the Species Guardian for *P.mauretanicus* for 2008 - 2009 (along with SPEA). There is also an EC proposal to develop a Community Plan of Action for reducing seabird by-catch in fisheries during 2009 – this will have relevance for *P.mauretanicus* as significant longline mortality for the species is strongly suspected (see Dunn, 2007).

In 2000, the Balearic Government designated three Special Protection Areas, so that all the Important Bird Areas (IBAs) where the species is known to nest are now protected. There is also a coastal SPA designated in 2005 for this species, in Catalunya, North-east Spain: <http://www.boe.es/boe/dias/2005/06/30/pdfs/A23405-23414.pdf>. However, few IBAs have been identified so far within the OSPAR Area for this species. Two ongoing LIFE projects (Sept 2005 - Sept 2008¹²) are being carried out by the BirdLife Partners in Spain (SEO/BirdLife) and Portugal (SPEA) with the aim of creating inventories of marine IBAs to ensure effective protection of the species' foraging grounds around the Iberian Peninsula (and the Balearic and Macaronesian Islands)¹³. Final results and outputs for both projects will be made available during 2009. In Portugal, the national protected area network is not considered adequate for the protection of this species (Pedro Gerales, *in litt.* 2008). In France, the *Ligue pour la Protection des Oiseaux* (LPO) is planning to address marine IBAs, focusing on the *P.mauretanicus* along the Atlantic coast in the near future, and there are

¹¹ See <http://www.ecologie.gouv.fr/Liste-des-especes-d-oiseaux.html> or http://www.ecologie.gouv.fr/IMG/pdf/Liste_oiseaux-2.pdf

¹² The Spanish project has recently been extended to February 2009.

¹³ This work, which includes research into the relation between marine habitat data (such as currents, chlorophyll, salinity, sea surface temperature etc) and seabird presence, should provide evidence whether most of the population of *P.mauretanicus* is restricted to only a small number of locations in the OSPAR Area during the post-breeding period or ranges more widely. Predictive models of habitat suitability for *P.mauretanicus* have already been produced. See www.seo.org/?lifeibamarinas (Spain) and <http://programamarinho.spea.pt/index.php?op=projibas> (Portugal).

proposals to designate some marine Natura 2000 sites specifically for this species (Bernard Cadiou, *in litt.* 2008).

As far as monitoring efforts are concerned, UK waters are currently covered by SeaWatch SW, but funding will be required to support this in future years. In France, data are collated and compiled by Pierre Yésou, *Office National de la Chasse et de la Faune Sauvage* (email: pierre.yesou@oncfs.gouv.fr). Ship-based observations covering the western English Channel and eastern Bay of Biscay have also been made by the Biscay Dolphin Research Programme between 1995 and 2001 (Hobbs *et al.*, 2003). France is also working to develop a monitoring programme for the Bay of Biscay region that will cover both seabirds and marine mammals, and should be particularly relevant for this species. In Spain, most monitoring focuses on the breeding colonies and neighbouring areas, although a monitoring scheme for the migration routes and feeding and wintering areas is planned for the near future (Javier Pantoja *in litt.* 2008).

Species specific conservation efforts in the Balearic Islands have included measures to control predators, monitor nesting areas and chicks, publication of species identification guides, and public education and awareness raising (Balearic Islands Government); and assessment of longline fisheries on *P. mauretanicus* (SEO/BirdLife, National General Directorate for Fisheries and Valencia Regional Government). However, there have been no specific conservation measures for *P. mauretanicus* within the OSPAR Region.

6. Conclusion on overall status

This species only breeds in the Balearic Islands in the Mediterranean, but after the breeding season, between late May and the end of July, the majority of the global population passes through the Strait of Gibraltar and into the OSPAR Maritime Area. Most individuals return to the Mediterranean in the autumn (September to November), but a few overwinter in the Atlantic. Hence, the OSPAR area is of global importance for the species during the summer months (particularly June to October). There is increasing evidence for a northwards shift in its core post-breeding range, which has been suggested as a result of changes in sea surface temperature due to climate change. If this trend continues, these areas will become increasingly important for conservation efforts by OSPAR in the future.

The most recent estimates put the breeding population at 2000 – 2400 pairs at 24 colonies, and a total global population in the region of 18 000 to >25 000 individuals, which is considered small. Several breeding colonies on the Balearic Islands have disappeared completely in the last few decades, and at-sea censuses, in both the Mediterranean and within the OSPAR area have similarly shown significant and rapid declines. The species faces a very high risk of extinction (more than 50% within three generations) and is classified as Critically Endangered.

This species' very small breeding range (<10 km²) and nesting behaviour, make it susceptible to predation by introduced mammals, habitat loss and degradation and disturbance and the key threats at its breeding grounds are predation by invasive mammalian predators, and coastal development (with associated light pollution and other disturbance). However, the declining population trend cannot be explained by these threats alone and significant mortality at sea appears to play a significant role. At-sea threats are less well understood but the species' tendency to congregate in large numbers in coastal waters, often near harbours, makes it vulnerable to oil spills, particularly in the moulting quarters, and susceptible to interactions with commercial fisheries (including by-catch). Consequently, the key threats in the OSPAR area are considered to be interactions from commercial fisheries (largely by-catch and competition for prey species, but there are also concerns over the potential adverse impact from the new fishery policy to reduce fish discards, if coupled with natural prey overexploitation), from oil pollution, and possibly from toxic phytoplankton in some feeding areas.

The species is listed (as *Puffinus puffinus mauretanicus*) in Annex I of the EU Birds Directive, 79/409/EEC. However, there has been little conservation management action taken to date for the species in the OSPAR area, and current conservation measures are inadequate and need to be increased. In conclusion, the species has a small and declining global population, suffers from significant threats, and could become extinct within 50 years if the current trends continue and threats are not addressed.

7. What action should be taken at an OSPAR level?

Action/measures that OSPAR could take, subject to OSPAR agreement

OSPAR Actions

Communication: OSPAR should contact the European Commission and the International Maritime Organisation and other relevant authorities to:

- a. notify them of the listing under OSPAR, threats facing the species, and the willingness of OSPAR to co-operate in developing conservation measures;
- b. request information on the effectiveness of any measures taken for this subspecies (if any);
- c. urge that, where relevant, they support the expansion of annual monitoring to a greater number of colonies on the Balearics to better detect population trends;
- d. urge that, where relevant, they support at-sea monitoring of this species, particularly in the OSPAR area (see below).

Awareness raising: OSPAR should work with relevant Contracting Parties (see Table 2 below) to raise awareness of status and threats to the species among both management authorities and the general public¹⁴.

Species Action Plan: OSPAR should work with relevant Contracting Parties to promote development and implementation of an updated version of the EC Species Action Plan (1999) among Member States, noting that this species requires a wide and well-coordinated conservation and recovery strategy.

Monitoring and Assessment: OSPAR should work with relevant Contracting Parties to facilitate development of a monitoring strategy for *P.mauretanicus* for the OSPAR area, involving relevant international authorities, and deliver to national contacts. This should take into account the need to assess distribution, population size and trends including identification of main feeding areas and confirmation of key threats, including those as its post-breeding range extends northwards and the need to support at-sea monitoring of this species, particularly in the OSPAR area. OSPAR's work on coordination of assessment and monitoring should address this need.

Monitoring: OSPAR should work with Spain to support expansion of annual monitoring to a greater number of colonies on the Balearics to better detect population trends.

¹⁴ This could perhaps best be achieved, at least initially, through a brochure and accompanying web site that lists all OSPAR Listed features, the threats they face, and recommended conservation actions.

Further research: OSPAR should emphasise to relevant scientific funding bodies the following research needs with respect to *P. mauretanicus*:

- a. further research to confirm the apparent northward extension of range in the Atlantic and the causes behind this;
- b. further research on the interactions of this species with commercial fisheries.

Actions/measures for relevant Contracting Parties

OSPAR should recommend that relevant Contracting Parties undertake the following actions and measures, and establish a mechanism by which Contracting Parties report back on the implementation of these actions and measures, and the implementation of the monitoring and assessment strategy, so that the progress can be evaluated in conjunction with the future assessment of the status of the species:

- a. Monitoring and Assessment: develop and implement the above strategy in the Atlantic, particularly Spain, Portugal, France, UK and Ireland,¹⁵;
- b. MPAs (for flyways): where possible, consistently used marine areas and key flyways within the OSPAR area should be identified and designated as SPAs and/or OSPAR MPAs. This could build on the work currently being undertaken in Spain (by SEO) and Portugal (by SPEA)¹⁶. OSPAR may wish to consider this report at a future meeting.

Table 2: Summary of key threats and existing protection for *P. mauretanicus*

Key threats	<p>Predation at breeding sites (mammalian predators), and coastal development (with associated light pollution) in Mediterranean.</p> <p>Away from the breeding colonies and into the OSPAR area, marine pollution and interaction with commercial fisheries, principally capture in fishing nets and on longlines, but also potential changes in EU fishing policy, and possible impact due to toxic phytoplankton in some feeding areas.</p>
Relevant Contracting Parties	<p>Spain, Portugal, France, UK, Republic of Ireland</p> <p>[Netherlands, Sweden, Belgium, Denmark and Norway seem to be increasingly important during the summer months]</p>
Other responsible authorities	<p>EC</p> <p>IMO</p>

¹⁵ Forward modelling of Sea Surface Temperature (SST) data has been suggested to identify potential future sites of importance in Atlantic waters, e.g. SW Scotland, for the species, but the link between SST and shearwater distribution has not yet been formally established (see Votier *et al.*, 2008).

¹⁶ Habitat modelling can help identify potentially significant sites, but such modelling needs to have a better understanding of the environmental variables, which influence the distribution of the species within the OSPAR area. These should include (but not be confined to) Sea Surface Temperatures.

<p>Already protected? Measures adequate?</p>	<p>Birds Directive – Annex I (as <i>Puffinus puffinus mauretanicus</i>)</p> <p>Bern Convention - Annex II</p> <p>CMS Appendix I</p> <p>National protection/recognition in: Spain, France, Portugal.</p> <p>1999 EC Species Action Plan, and subsequent Recovery Plans</p>	<p>SPAs in Balearics cover the breeding sites for this species, but, as yet, there are no marine SPAs for the species in Atlantic. Ongoing LIFE projects in Spain and Portugal are investigating marine IBAs including for this species.</p> <p>There are some species protection and management measures at breeding sites in the Balearics but not for the dispersed birds in the OSPAR area.</p> <p>There is some monitoring at Straits of Gibraltar, in France and UK/Ireland but not coordinated.</p>
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Brief summary of the proposed monitoring system

At present there is limited understanding of exactly where the birds congregate in Atlantic waters during post-breeding dispersal and data from Gibraltar show there could possibly be many “missing” pairs not currently being monitored. More long-term monitoring of key strategic flyways is required, e.g. Gibraltar (increase coverage), Iberian capes, and Moroccan capes. There also needs to be better linkage between the various monitoring schemes mentioned above and also with voluntary schemes, such as the Trektellen monitoring network and database that hosts migration counts and ringing records for the Netherlands, Belgium, Great Britain, France, Germany, Spain and Portugal (<http://www.trektellen.nl/>), and the Iberian Seawatching Network (*Red de observación de Aves y Mamíferos marinos* or RAM).

There is no coordinated monitoring scheme for the species’ range within the Atlantic. OSPAR could play an important part in helping to design, promote and coordinate the collection of information on the numbers, distribution and activities of *P.mauretanicus* and threats faced by the species in the important post-breeding Atlantic waters (and also of the small numbers of birds that remain to winter in the Atlantic), including collation of information on the status of its prey fish species, whether the resource is overexploited by human fishing activity, SST and other environmental variables, and how these might impact on the species. Relevant Contracting Parties (Spain, Portugal, France, UK and Ireland, along with the Netherlands, Sweden, Belgium, Denmark and Norway), should be tasked to report to OSPAR on:

- Results of any annual monitoring programmes (government or non-government funded), e.g. SeaWatch SW, including data on numbers and location, fisheries activities and information on prey distribution in area, along with environmental data on sea conditions (e.g. SST);
- Deaths of birds due to oil pollution incidents and fisheries by-catch.

A monitoring programme would be best organised through the development of a specific OSPAR monitoring plan for *P.mauretanicus*, and establishment of a records database.

Annex 1: Overview of data and information provided by Contracting Parties

* - Information from BirdLife International (2008); '?' signifies occurrence information not available from BirdLife International's database.

Contracting Party	Feature occurs in CP's Maritime Area*	OSPAR nominated Contact Point (in bold), or other contributor providing information	Contribution made to the assessment (e.g. data/information provided, national reports, references or weblinks)
Belgium	Vagrant		
Denmark	Scarce summer and autumn migrant		
European Commission			
France	Yes	Bernard Cadiou, Bretagne Vivante conservation.bretagne-vivante@wanadoo.fr	Information on legal protection, monitoring and potential inclusion in marine Natura 2000 sites provided. Wynn, R. B. and Yésou, P. 2007. The changing status of Balearic Shearwater in northwest European waters. <i>British Birds</i> 100: 392-406. Yésou P., Barzic A., Wynn R.B. and Le Mao P. (2007). La France est responsable de la conservation du puffin des Baléares <i>Puffinus mauretanicus</i> . <i>Alauda</i> 75 : 287-289.
Germany	Vagrant		
Iceland	?		
Ireland	Yes	Dr Eamonn Kelly (DEHLG) eamonn.kelly@environ.ie	Provided information via David Tierney david.tierney@environ.ie Information on national protection measures provided.
Netherlands	Scarce summer and autumn migrant		
Norway	Vagrant		
Portugal	Yes	Pedro Geraldès (SPEA) pedro.geraldes@spea.pt	Information on legal protection, importance of existing protected areas, current conservation measures provided.

Spain	Yes	<p>Javier Pantoja (DG Biodiversity- Min. Environment) Jpantoja@mma.es</p> <p>Pep Arcos (SEO) jmarcos@seo.org</p>	<p>Information on legal status of species and current conservation measures, protected sites and monitoring provided.</p> <p>Information on population size and trends, threats, progress on identification of key areas for <i>P.mauretanicus</i> and marine IBAs, legal status of species and current conservation measures and monitoring provided.</p> <p>Arcos, J.M. and Oro, D. (2002). Significance of fisheries discards for a threatened Mediterranean seabird, the Balearic shearwater <i>Puffinus mauretanicus</i>. Marine Ecology Progress Series 239: 209–220.</p> <p>Arcos, J.M. and Oro, D. (2003). Pardela Balear <i>Puffinus mauretanicus</i>. Pp. 88–89 in: Martí, R. and del Moral, J.C. (eds.) Atlas de las aves reproductoras de España. Madrid: Dirección General de Conservación de la Naturaleza – Sociedad Española de Ornitología.</p> <p>Arcos, J.M. and Oro, D. (2004) Pardela Balear <i>Puffinus mauretanicus</i>. Pp. 46–50 in: Madroño, A., González, C., and Atienza, J.C. (eds.) Libro Rojo de las Aves de España. Madrid, Spain: Dirección General para la Biodiversidad – SEO/BirdLife.</p> <p>Arcos, J.M., Ruiz, X., Bearhop, S. and Furness, R.W. (2002). Mercury levels in seabirds and their fish prey at the Ebro Delta (NW Mediterranean): the role of trawler discards as a source of contamination. Marine Ecology Progress Series 232: 281-290.</p> <p>Arcos, J.M., Hernández, E., Oro, D. and Furness, R.W. (2004). Mercury levels in the NW Mediterranean: what do fish and seabirds reveal? 8th Seabird Group International Conference. Seabird Group. University of Aberdeen, UK, April 2004.</p> <p>Arcos, J.M., Louzao, M. and Oro, D. (2008). Fishery Ecosystem Impacts and Management in the Mediterranean: Seabirds Point of View. Pp. 1471-1479 In: Nielsen, J.L., Dodson, J.J., Friedland, K., Hamon, T.R., Hughes, N., Musick, J., and Verspoor, E. (eds) Reconciling Fisheries with Conservation: Proceedings of the Fourth World Fisheries Congress, Symposium 49. American Fisheries Society, Bethesda, Maryland.</p>
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			<p>Belda, E.J. and Sánchez, A. (2001). Seabird mortality on longline fisheries in the western Mediterranean: factors affecting by-catch and proposed mitigating measures. <i>Biological Conservation</i> 98: 357-363.</p> <p>Gutiérrez, R. and Figuerola, J. (1995). Wintering distribution of the Balearic Shearwater (<i>Puffinus yelkouan mauretanicus</i>) off the northeastern coast of Spain. <i>Ardeola</i> 42(2): 161-166.</p> <p>Louzao, M., Hyrenbach, K.D., Arcos, J.M., Abelló, P., Gil de Sola, L. and Oro, D. (2006a). Oceanographic habitat of a critically endangered Mediterranean Procellariiform: implications for Marine Protected Areas. <i>Ecological Applications</i> 16: 1683–1695.</p> <p>Louzao, M., Igual, J.M., McMinn, M., Aguilar, J.S., Triay, R. and Oro, D. (2006b). Small pelagic fish, trawling discards and breeding performance of the critically endangered Balearic Shearwater: improving conservation diagnosis. <i>Marine Ecology Progress Series</i> 318: 247–254.</p> <p>Mayol-Serra, J., Aguilar, J.S. and Yésou, P. (2000). The Balearic Shearwater <i>Puffinus mauretanicus</i>: status and threats. Pp. 24–37 in Yésou, P. and Sultana, J. (eds.) <i>Monitoring and conservation of birds, mammals and sea turtles of the Mediterranean and Black Seas. Proceedings of the 5th Medmaravis Symposium</i>. Malta: Environment Protection Department.</p> <p>Mouriño, J., Arcos, F., Salvadores, R., Sandoval, A. and Vidal, C. (2003). Status of the Balearic shearwater (<i>Puffinus mauretanicus</i>) on the Galician coast (NW Iberian Peninsula). <i>Scientia Marina</i> 67: 135–142.</p> <p>Votier, S. C., Bearhop, S., Attrill, M. J., and Oro, D. (2008). Comment: is climate change the most likely driver of range expansion for a critically endangered top predator in northeast Atlantic waters? <i>Biology Letters</i> (doi:10.1098/rsbl.2007.0558).</p>
Sweden	Vagrant		
UK	Yes	<p>Russell Wynn (National Oceanography Centre) rbw1@noc.soton.ac.uk</p>	<p>Wynn, R. B. and Yésou, P. 2007. The changing status of Balearic Shearwater in northwest European waters. <i>British Birds</i> 100: 392406.</p> <p>Wynn, R.B., Josey, S.A., Martin, A.P., Johns, D.G. and Yésou, P. (2007). Climate-driven range expansion of a critically endangered top predator in northeast Atlantic waters. <i>Biology Letters</i> 3: 529 532. (doi:10.1098/rsbl.2007.0162).</p>

Summaries of country-specific information provided

France. *P. mauretanicus* is a regular and common migrant along the French coast between Arcachon in southern Biscay and southern Brittany. In the early 1980s, there were an estimated 8000 - 10 000 individuals during the summer months, with the greatest numbers recorded in the Mor-Braz area of southern Brittany and along the coast of Vendée (Hémery *et al.*, 1986; Le Mao and Yésou, 1993). At Mor-Braz, numbers appear to have declined since the 1980s, with only a few hundred counted since, although 1500 were recorded in late September 2002 and 1100 in early September 2006. At Vendée, 6000 - 7500 were recorded in July - August in the early 1980s, and subsequent at-sea surveys up to the mid 1990s showed little change in relative abundance. Since then there has been marked inter-annual variability in numbers, but in 2003 an estimated 6000 - 7000 occurred on 31 August/1 September (Wynn and Yésou, 2007), which represents around 65% of the estimated world population. At-sea observations revealed that few birds occur over deep water (Hobbs *et al.*, 2003).

P. mauretanicus has also been recorded along the coast of North-west France (north of 48°N) since the beginning of seawatch surveys in the 1960s. The species was uncommon in the 1970s but sightings increased in the 1990s with peaks of 2150 in 1996 and 2250 in 1997, before declining to a few hundred in the late 1990s and early 2000s (Wynn and Yésou, 2007). The species is frequently recorded along the northern coast of Brittany in the western part of the English Channel between the end of June and early October, with a few sightings of single birds or small parties through to January. Large groups have been recorded feeding on shoaling fish in the Golfe de Saint Malo, between Baie de Saint-Brieuc and Baie du Mont-Saint-Michael and the Chausey Islands. The species is much scarcer in the eastern half of the English Channel, where it is considered a scarce summer and autumn migrant, with only a few tens of individuals seen each year at any single locality.

The Netherlands. *P. mauretanicus* has traditionally been regarded as a scarce summer and autumn migrant but reported numbers have increased substantially to around 15 - 20 birds between 1990 - 2003, with a recorded peak of 27 birds reported in 1996 and 2001. The vast majority of birds occur in July - September (Wynn and Yésou, 2007).

Denmark. The species is a scarce summer and autumn migrant, with few records before 1990, but again there has been an increase in records since that time to around 4 - 10 a year (Wynn and Yésou, 2007).

Sweden. All records are from the south-west coast. Since 1997, there has been a marked increase, with a total of 18 between 1997 - 2004, with peaks of 5 in 1997 and 6 in 2003 (Wynn and Yésou, 2007). All birds recorded between late June and early October.

Norway. Ten sightings have been reported between 1997 and 2004. All but one record occurred between late June and early October (Wynn and Yésou 2007).

UK and Ireland. Between 1980 and 1989 numbers of *P. mauretanicus* recorded in UK and Irish waters remained consistently low, with an average of 318 birds reported each year. Since 1990, however, the species has shown a dramatic increase, especially since the mid-1990s, reaching a peak of 3474 birds in 2001, although there is marked inter-annual variability (Wynn and Yésou, 2007). Distribution of records is heavily biased towards the south-west of England (an average of 70% of the records recorded annually in UK and Irish waters, mostly from Cornwall, Dorset, Devon), Wales (average of 13% of records), and in Irish waters (average of 7% of the 1990 - 2003 records). The vast majority of records occur between July and October.

Portugal. Large numbers of *P. mauretanicus* are regularly seen moving along the Portuguese coast migrating to and from the Bay of Biscay. The highest counts are typically in September, the peak being 11 000 moving south off the Lisbon coast on 29 September 1990 (Patterson, 1997 - reported in

Wynn and Yésou, 2007). Significant numbers have been recorded in inshore waters along the coast between Figueira da Foz and Aveiro, with large rafts of 100 - 200 birds and numbers of feeding birds indicating this may be an important staging area. Large numbers were also been seen along the Lisbon coast between Guincho and Cascais in June 2004, when a 1294 were recorded on 2 June, and feeding flocks of up to 700 birds were recorded.

Spain. The entire global population of this species breeds in the Balearic Islands (see above) and Spanish waters are among the major wintering areas for the species. Within Spain's OSPAR area, birds have been recorded moving along the Galician coast of northwest Spain since 1976, with a pronounced passage to the north-east between June and August and return to the south-west in September and October. In 2007, land-based counts of migration through the Straits of Gibraltar gave a figure of 12 270 birds leaving the Mediterranean from 23 May to 9 July in 222.5 hours of observation (35% of total light time), which produced a conservative estimate of approximately 25 000 birds migrating through the Strait (Arroyo *et al.*, 2008). A more intensive monitoring programme in 2008, covering 65% of the period between 15 May and 15 July, revealed a net movement of over 18 000 birds into the Atlantic. http://www.fundacionmigres.org/pardela_balear08.html. Ongoing work by SEO/BirdLife and SPEA suggests the species is particularly common in the Gulf of Cadiz (Pep Arcos *in litt.* 2008). The largest recorded movement was of 2085 birds heading north off Cabo Fisterra (Cape Finisterre) on 28 July 1985. Flocks tend to occur at the mouths of the Ponteverda and Vigo rias (Mouriño *et al.*, 2003). Few large flocks are recorded between November and May, with 84% of records occurring between June and September.

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