Nomination

*Puffinus mauretanicus* - Balearic Shearwater

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**Geographical extent**

OSPAR Regions: II, III, IV, (V)

Biogeographic zones: 1,2,4-6-9,11,13

Region & Biogeographic zones specified for decline and/or threat: As above

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). During the breeding season, the species forages mainly along the eastern Iberian coast, with the largest concentrations occurring off the Ebro Delta (Louzao *et al.*, 2006a). After the breeding season, the species moves into the Atlantic, dispersing northwards along the coasts of Portugal and north-western Spain to the traditional post-breeding grounds in the Bay of Biscay, off the coast of western France (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 (Wynn and Yésou, 2007; Wynn *et al.*, 2007), Some birds over-winter in the Atlantic (off south-west UK, in the Bay of Biscay and off the coast of Morocco), but most individuals return to the Mediterranean in the autumn (Mayol-Serra *et al.*, 2000), where large gatherings of birds winter off the coast of eastern Spain.

**Application of the Texel-Faial criteria**

*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 threat.

**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 Area during the post-breeding period (Le Mao and Yésou, 1993). Individuals start leaving the Mediterranean in late May with passage through the Strait of Gibraltar peaking in June, so by the end of July the bulk of the population is in the Atlantic (Mayol-Serra *et al.*, 2000). The return passage to the Mediterranean begins in September and peaks in October–November, although late individuals are still recorded passing through the Strait of Gibraltar between December and April (Mayol-Serra *et al.*, 2000).

The OSPAR area is hence of global importance for the species during the summer months (particularly June to October), when a high proportion of the total population occurs along the coasts of Portugal, north-western Spain, western France and southern/western Britain and Ireland.

**Rarity**

The global breeding population of this species is small. The most comprehensive census to date, based on surveys carried out between 2000–2005, gave an estimate of 2,000–2,400 breeding pairs at 24 colonies (Rodríguez Molina and McMinn Grivé, 2005; Viada, 2006). The total global population – including a significant number of ‘floating’ non-breeding birds – is currently believed to number in the region of 10,000 individuals (Wynn and Yésou, 2007).

**Decline**

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).

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). Since both colonies were free of mammalian predators, the low adult survival between years is likely to be a consequence of at-

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3 *Puffinus mauretanicus* was formerly treated as a subspecies of *P. yelkouan* (and before that *P. puffinus*), but is now considered to deserve specific status (e.g. Austin, 1996; Heidrich *et al.*, 1998; Brooke, 2004).
sea mortality away from the colonies (Oro et al., 2004). A model based on the demographic parameters derived from the 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).

At-sea censuses have 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 8,000–10,000 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-breeding distribution, 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.

As a consequence of its rapidly declining population, the species faces a very high risk of extinction and is currently classified as Critically Endangered (Arcos and Oro, 2004; IUCN 2007).

Sensitivity

This species has very low resistance, with several aspects of its behaviour and ecology making it very sensitive to the adverse effects of human activities. Its very small breeding range (<10 km²) and nesting sensitive to the adverse effects of human activities. This species has very low extinction and is currently classified as Critically population, the species faces a very high risk of cause for concern. representing significant reductions in numbers, and are levels suggested by Oro at-sea concentrations do not reach the dramatic 2007). While the recorded rates of decline in these post-breeding distribution, 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.

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Threat

The species currently faces threats at its breeding grounds and in its non-breeding quarters, both of which have an impact on the population summering in the OSPAR Area.

Predation of eggs and chicks by rats, and of adults by introduced mammals such as domestic cats and mustelids, is a significant threat 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 means that the number of suitable nesting areas is limited, 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). The use of lights for certain fishing practices, leisure craft and urban lighting near colonies may disturb breeding birds and fledglings (Aguilar, 1999; Gutiérrez, 2003; Ruiz and Martí, 2004). The occurrence of Yelkouan Shearwaters Puffinus yelkouan at one colony in Menorca 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. Overexploitation and changes in the distribution of its fish prey is a potentially increasing threat (Aguilar, 1999; Arcos and Oro, 2004). 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 *Puffinus 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). The increasing importance for the species of fishery discards (see ‘Sensitivity’) – potentially 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 long-lines and in fishing nets than *Calonectris diomedea* (Aguilar, 1999; Belda and Sánchez, 2001), its congregatory behaviour and close association with fishing vessels can result in occasional instances of ‘mass mortality’ (Arcos and Oro, 2004; Ruiz and Martí, 2004). These events could be difficult to detect in a standard monitoring program, given their occasional nature, but could have a high impact on the Balearic Shearwater population (Arcos et al., in press). The species’ tendency to congregate in coastal waters 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, remains unquantified (Arcos and Oro, 2004; Ruiz and Martí, 2004, Arcos et al., 2004). Poisoning by toxic phytoplankton may be a threat in some feeding areas, particularly the Mor-Braz area, north of the Loire estuary (Mayol-Serra et al., 2000).

**Relevant additional considerations**

**Sufficiency of data**

Trends based on comparisons of breeding population estimates over time may be confounded by differing survey methodologies and effort. Nevertheless, the recent extinction of entire breeding colonies, and the results of the recent multi-year demographic study at two colonies (Oro et al., 2004) provide clear evidence of an ongoing population decline. Models of this decline were particularly sensitive to changes in adult survival, but this parameter was estimated with a narrow confidence interval, based on capture data from six breeding seasons, so it is likely to be robust (Oro et al., 2004).

Further studies are required to clarify the extent to which the reductions in numbers in the Bay of Biscay and off north-east Spain are the consequence of an overall population decline and/or changes in the species’ wintering and post-breeding distributions.

Threats, past and present, at the breeding colonies are relatively well documented (e.g. Aguilar, 1999; Arcos and Oro, 2004), but do not fully explain the rapid population decline or the high levels of adult mortality (Oro et al., 2004). At-sea threats are currently less well understood, however, and further studies are needed to determine their relative importance in the Mediterranean and the OSPAR area.

**Changes in relation to natural variability**

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 (Louzao et al., 2006). Recent changes in the Balearic Shearwater distribution range within the OSPAR area seem to parallel changes in its prey distribution (Wynn et al., 2007).

**Expert judgement**

There is good evidence of the threats facing this species, including those that would be relevant to the OSPAR Area. Expert judgement is required to assess the likely extent of decline across the OSPAR region for this species, given the severe declines documented at the breeding colonies.

**ICES Evaluation**

[Not yet evaluated]

**Threat and link to human activities**

*Cross-reference to checklist of human activities in OSPAR MPA guidelines*;

*Relevant human activity:* Constructions (e.g. Offshore wind-farm); Land-based activities;
Shipping and navigation; Fishing, hunting, harvesting; Tourism and recreational activities\(^4\).


At the breeding colonies, *Puffinus mauretanicus* are threatened by several human activities. Introduced ground predators threaten eggs and chicks, and development of the coast (with associated light pollution) cuts down the availability of suitable nesting habitat for the species.

Away from the breeding colonies and into the OSPAR Area, marine pollution and incidental capture in fishing nets are the main threats that are directly linked to human activities. The species’ congregatory behaviour exacerbates the potential effect of both of these threats.

Human activities are also likely to have an indirect impact on the species via climate change effects. Human-induced climate change is leading to increasing sea temperatures, in turn affecting the abundance and distribution of prey fish species. In response the species has to disperse further in the post-breeding season to find adequate food supply, and there is some evidence that there is also a resulting increase in this species’ dependence on fishery discards as a food source – bringing the birds into dangerous proximity with fishing vessels and further increasing the likelihood of a ‘mass mortality’ event.

**Management considerations**

The species is listed (as *Puffinus puffinus mauretanicus*) in Annex I of the EU Birds Directive, 79/409/EEC. A 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). In 1999, a Species Action Plan was prepared for the European Commission by BirdLife International (Aguilar, 1999). In 2000, the species was listed as “in Danger of Extinction” in the Spanish National Catalogue of Threated Species (Ruiz and Martí, 2004), and the Balearic Government designated three new Special Protection Areas, such that all the Important Bird Areas (IBAs) identified for the species when nesting are now protected. 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 the species is also the subject of a National Strategy for Conservation in Spain (Anon., 2005). In November 2005, the species was added to Appendix I of the Convention on Migratory Species by the Eighth Conference of the Parties. Ongoing LIFE projects by the BirdLife Partners in Spain (SEO/BirdLife) and Portugal (SPEA) to create inventories of marine IBAs will be the first step towards the effective protection of the species’ foraging grounds around the Iberian Peninsula (and the Balearic Islands). However, there has been little other action taken to date for the species in the OSPAR area.

This species requires a wide and well-coordinated conservation and recovery strategy, to study population trends, size and distribution, threats and competition with other bird species. Activities in the OSPAR area should complement those activities both planned and already executed in the Mediterranean (such as protecting breeding and feeding areas, and raising the awareness of local fishermen).

Within the OSPAR area, it is vital to diagnose and ameliorate the threats the species may face as its post-breeding range expands northwards. This species suffers from high adult mortality, and so the threats that are faced in the OSPAR area are likely to be having a significant impact on the overall population of this threatened species. Monitoring and assessment under OSPAR (if this species was listed) could play an important part in coordinating the collection of information about the time spent by Balearic Shearwaters in OSPAR waters. This should include more information about the threats faced by this species in OSPAR waters, and more work to understand these if necessary, for example collation of information on the status of its prey fish species, whether the resource is overexploited by human fishing activity, and how this might impact on the Balearic Shearwater. At present there is limited understanding of exactly where the birds now congregate in Atlantic waters during post-breeding dispersal. Forward modelling of SST data could be used to identify potential future sites of importance in Atlantic waters e.g. SW Scotland.

Gibraltar data from this year 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. The UK is covered at present by SeaWatch SW – but funding will be required to support this in future years.

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\(^4\) N.B. This activity may mainly be a threat outside the OSPAR Area.
Where possible, consistently-used sites and key flyways within the OSPAR area should be identified and designated as SPAs and/or OSPAR MPAs.

Further information
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Useful references:


