# THE BALEARIC SHEARWATER *PUFFINUS MAURETANICUS*: A REVIEW OF FACTS AND QUESTIONS

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Yésou, P., 2006. The Balearic Shearwater *Puffinus mauretanicus*: a review of facts and questions. Atlantic Seabirds 8(1/2): 73-80. *The systematic relationships of* Puffinus mauretanicus, *which breeds in the Balearic Islands in the western Mediterranean, have been disputed since its initial description as a subspecies of the Manx Shearwater* P. puffinus. *It is presently considered a species of its own, slightly differentiated from Yelkouan Shearwater* P. yelkouan, *a 'sibling species' which breeds elsewhere in the Mediterranean. However, birds seemingly intermediate between these two forms are breeding in Menorca, and further research is needed to confirm whether the two taxa really are different species. Bearing its limited breeding range and population size in mind, it is rather odd that the Balearic Shearwater has not been classified as threatened by BirdLife International in its Threatened Birds of the World, 2000. Since then, population studies have sounded the alarm, suggesting that the species might disappear within a few decades, and the Balearic Shearwater is now categorized as 'Critically Endangered'. Published population estimates are not always reliable, however, and its population dynamics remains poorly understood. Threats are better known and include mammal predators at breeding sites, mortality induced by long-line fishing, and probably a greater difficulty to access food resources.*

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## INTRODUCTION

The Balearic Shearwater *Puffinus mauretanicus* is endemic to the Balearic Islands, in the western Mediterranean. Although its distribution, including non-breeding dispersal, and its biology are relatively well known (Ruiz & Martí 2004), various points remain unclarified regarding its taxonomy, its population size, and its conservation status. These topics are reviewed here with the aim of highlighting what the priorities could be for further studies.

## TAXONOMY

First described by Lowe in 1921, *mauretanicus* has long been considered a subspecies of the Manx Shearwater *P. puffinus* together with another Mediterranean taxa, *yelkouan*. When the morphological and behavioural

differences between Manx and the two Mediterranean taxa became better understood, the latter duet was united into one species, the Yelkouan (or Levantine) Shearwater *P. yelkouan*, following Bourne *et al.* (1988). Reasons to split *P. yelkouan* into two species were therafter given by Sangster *et al.* (1997), who considered the two taxa as originating from different stocks. The latter assumption was contradicted by both bio-acoustics (Bretagnolle & Zotier 1998) and genetics (Heidrich *et al.* 1998, 2000; Austin *et al.* 2004), which both emphasized the sister relationships of *mauretanicus* and *yelkouan*, but the split of the two species became widely accepted (e.g. Sangster *et al.* 2002).

As usual nowadays when accepting changes in avian systematics, a high credential was given to genetic data (i.e., Heidrich *et al.* 1998, 2000). As a genetist, Petra Heidrich (pers. comm. 1998) was however unsure whether these taxa were to be regarded as different species, because of a relatively low divergence between them, and because she had compared *mauretanicus* to birds from eastern Mediterranean, not to the nearest *yelkouan* from southern France or Sardinia. She was prompted to split the taxa by her correspondants in the Balearic, who put forward both biological and osteological reasons. Unfortunately, the osteological approach is weakened as it forgot to take into account Mayaud's (1932) conclusions on a larger data set (Yésou & Paterson 1999), and it may even be flawed as the preparation technique affected the reference material (M. McMinn, pers. comm.). The biological support holds in differences in breeding calendar between the taxa and the fact that no 'intermediate' population was known, although overlap occurs in both biometry and overall appearance (Yésou & Paterson 1999).

During the first intensive survey of breeding sites all over the Balearic Islands in 1999-2001, observers realized that some breeders in Menorca exhibited a more contrasted plumage than is usually seen around the other islands, almost pure white below and thus resembling *yelkouan*, and so news was quickly released that Yelkouan Shearwater was breeding in Menorca (Martí & Ruiz 2001; Ruiz *et al.* 2003; Guttiérrez 2004). A more critical approach might have been preferred, particularly since pale individuals were already known to occur in Menorca (e.g., E.J. Mackrill in Yésou *et al.* 1990) which at the time have been identified as *mauretanicus* on characters such as size and structure.

Furthermore, some of the pale birds found in recent years were breeding in the same colony than undisputed *mauretanicus* (M. McMinn, pers. comm.; Genovart *et al.* 2005), a rather unexpected situation if they are not the same species. Although difference in breeding calendar has been put forward to support the split of *yelkouan* and *mauretanicus* in two species

(e.g., Heidrich *et al.* 1998, 2000), no such difference has been reported between the Menorcan pale birds given as *yelkouan* and the *mauretanicus* breeding nearby; even, it has been suggested that they might interbreed (Genovart *et al.* 2005). The fact is that intergradation between the two taxa might have occurred, since genetic study of Menorcan pale birds showed a differentation of only 1.6% from *mauretanicus* (Genovart *et al.* 2005), which is lower than the 2.2-2.9% found between *mauretanicus* from Mallorca and undisputed *yelkouan* from eastern Mediterranean (Heidrich *et al.* 1998, 2000) and soutern France (Austin *et al.* 2004). A last point concerns the biometrics of the pale Menorcan birds, which are controversial: Genovart *et al.* (2005) assumed that they "showed phenotypic traits of Yelkouan shearwaters" but published no biometric data; this is particularly disappointing since measurements of the so-called *yelkouan* caught in Menorca in 2000 (S.E.O. unpublished, courtesy A.M. Paterson) differed markedly from those published for any undisputed *yelkouan* location, leading D. Oro and J.A. Alcover (in Ruiz & Martí 2004) to consider that either the variation between *yelkouan* and *mauretanicus* may be clinal, or the polymorphism of *mauretanicus* is higher than usually suspected.

To summarize, birds breeding in Menorca could be considered as 'intermediates' between *yelkouan* from other Mediterranean archipelagoes and the rest of the *mauretanicus* population, both in plumage and in measurements, questioning the phenotypical variability and relationships of these taxa. There is presently a wide agreement among scientists and conservationists in the Balearic that more research is needed (Ruiz & Martí 2004 ; J. Mayol, M. McMinn, J. Muntaner & D. Oro, *pers. comm.*).

## POPULATION SIZE AND DYNAMICS

The Balearic Shearwater breeds in caves often situated in steep cliffs. Having difficult access to most colonies, the size of the breeding population has long remained a matter of guesswork, derived from both the number of pairs at surveyed sites and, e.g., the number of birds rafting off the cliffs. In 1984, J. Mayol (per J. Muntaner *in litt.*) considered that there were between 1,300 and 2,800 breeding pairs (bp). De Juana (1984) and Capella (1988) thereafter proposed 1,000-5,000 and 2,000-3,000 bp, respectively. A census organized in 1991 gave 2,127-4,475 bp (Aguilar 1991 in Govern Balear 1997). Pooled estimates for the period 1991-1998 led to 2,084-4,414 bp and the population was still estimated at 2,190-4,256 bp in 1999, again pooling precise censuses and estimates (Ruiz & Martí 2004). Figures given by other authors were derived from the above, e.g. c. 3,000 bp in 1998 (Mayol-Serra *et al.* 2000) or c. 3,300 bp (BirdLife International 2000). Another census was carried out in

2001, with a more restrictive approach than in earlier years (optimistic estimates being avoided for those sites which cannot be carefully surveyed), leading to an estimated 1,750-2,125 bp (Ruiz & Martí 2004), not 1,650-2,050 bp as given by BirdLife International (2004). The survey of many breeding sites has been improved in subsequent years, e.g.using mountain gear to visit inaccessible colonies, and in 2005 the population was estimated at 2,000-2,400 bp (Rodriguez-Molina & McMinn-Grivé 2005a).

The above figures do not indicate any clear trend, particularly because upper range values are now considered to have been overestimated. However, although new colonies have been discovered, a decline is apparent at various sites surveyed over the long term and a contraction of the breeding range is obvious (Rodriguez-Molina & McMinn-Grivé 2005a). Similarly, a decline is suggested by surveys carried out during the summer exodus of Balearic Shearwaters to the Atlantic: by the mid 1980s it was estimated that 8,000-10,000 individuals occurred in the French waters of Biscay alone (Yésou 2003), while in 2005 these 8,000-10,000 correspond to the estimated size of the whole population of Balearic Shearwater (Rodriguez-Molina & McMinn-Grivé 2005a). Moreover, demographic studies at predator-free colonies indicate a poor breeding success and a much lower adult survival than expected for a medium-sized shearwater, the calculated value of demographic parameters even leading to the prediction that the species might disappear within a few decades (Oro *et al.* 2004). This prediction of a fast decline is nevertheless at odds with the slower erosion suggested by population censuses. Obviously, demographic data are to be improved, particularly regarding adult survival and the frequency of sabbatical (D. Oro *pers. comm.*).

## CONSERVATION STATUS

Despite its restricted range and limited number, the Balearic Shearwater was classified only as "lower risk / near threatened" by BirdLife International (2000), which is particularly surprising as the same publication quoted the Black-vented Shearwater *P. opisthomelas* as "vulnerable" –a less favourable status– although its estimated population size was more than twenty times higher than that of Balearic Shearwater. The situation was amended following the extensive field work carried out in 1999-2001 (Ruiz & Martí 2004) and the alarm bell rung by Oro *et al.* (2004), and the Balearic Shearwater is presently considered as "critically endangered" (BirdLife International 2004).

These birds are facing well identified problems at most breeding sites, particularly in the form of introduced mammal predators (Black Rat *Rattus*

*rattus*, Domestic Cat *Felix cattus* and Genet *Genetta genetta*). The poor breeding success and the apparent low survival of adults at predator-free sites further indicate that Balearic Shearwaters are also facing difficulties at sea. Indeed, fishing equipment is a source of mortality (Rodriguez-Molina & McMinn-Grivé 2005b). Lastly, it has been suggested that the food resources of these birds are under pressure; the distribution, abundance and availability of these resources are changing due to the evolution of fishery policies (including moratoria) and marked modifications in the marine environment. The effects of such changes remain unclear in the Mediterranean but have already led to a marked northward shift of the species range during its post-breeding dispersal in the Atlantic (Yésou 2003; Wynn 2005).

A conservation strategy is now under development in the Balearic Islands (Rodriguez-Molina & McMinn-Grivé 2005b) and this taxon has been given conservation priority all over its range unter the Convention on Migratory Species (UNEP 2005), but we still need to know more about the basic biology of the Balearic Shearwater in order to optimise our efforts to ensure its conservation.

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## VALE PIJLSTORMVOGELS *PUFFINUS MAURETANICUS*: EEN OVERZICHT VAN VRAGEN EN FEITEN

De taxonomische status van de Vale Pijlstormvogel *Puffinus mauretanicus*, die op de Balearen in de westelijke Middellandse Zee broedt, is al onderwerp van discussie sinds dit taxon voor het eerst als ondersoort van de Noordse Pijlstormvogel *P. puffnus* werd beschreven. Tegenwoordig wordt dit taxon beschouwd als een soort, die weinig verschilt van Yelkouan Pijlstormvogel *P. yelkouan*, een 'zustersoort' die elders in de Middellandse Zee broedt. Op Menorca broeden echter vogels die schijnbaar intermediair zijn tussen beide taxa. Verder onderzoek is nodig om te bevestigen of het inderdaad verschillende soorten zijn. Gezien de beperkte broedverspreiding en populatiegrootte is het opmerkelijk dat de Vale Pijlstormvogel niet is geklassificeerd als bedreigd ("threatened") in *Threatened Birds of the World, 2000* van BirdLife International. Na deze publicatie werd de alarmbel geluid naar aanleiding van populatiestudies, die suggereerden dat deze soort binnen een paar decades zou kunnen uitsterven. Met als gevolg dat de Vale Pijlstormvogel nu in de categorie ernstig bedreigd ('critically endangered') valt. Gepubliceerde populatieschattingen blijken echter niet altijd betrouwbaar te zijn en over de populatiedynamica is weinig bekend. Er is meer bekend over bedreigingen, waaronder predatie door zoogdieren op broedplaatsen, sterfte door long-linevisserij en (mogelijk) grotere problemen om voedsel te vinden.

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