Agreement on the Conservation of Albatrosses and Petrels

Third Meeting of the Population and Conservation Status Working Group

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ACAP Priority Population Assessment – *Puffinus mauretanicus* (Balearic shearwater) on the Balearic islands

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SUMMARY

Balearic shearwaters (*Puffinus mauretanicus*) breed only in the Balearic archipelago (western Mediterranean), and recent analysis shows that their population is declining at about 14% a year, with extinction predicted in a mean of 61 years. This well justifies its listing as Critically Endangered according to IUCN criteria. The decline is largely the result of poor adult and young adult survival, the major cause of which appears to be fisheries' bycatch. Decline may be accelerated by the introduction of EU fisheries' discard bans. Moreover, pressure from alien predators (not assessed so far, as there is no demographic data available from colonies exposed to this threat) might make the situation even worse. The species is now one of the most endangered birds in the western palearctic, and warrants consideration as an ACAP priority population for conservation management.

RECOMMENDATION

That the PaCSWG requests the Advisory Committee to:

1. Include Balearic shearwater (*Puffinus mauretanicus*) breeding in the Balearic archipelago as an ACAP priority population for conservation management.

Evaluación de poblaciones prioritarias de ACAP – *Puffinus mauretanicus* (pardela balear) en las Islas Baleares

RESUMEN

Las pardelas baleares (*Puffinus mauretanicus*) se reproducen únicamente en el archipiélago de las Islas Baleares (Mediterráneo occidental). Análisis recientes indican que su población está reduciéndose a un ritmo aproximado del 14% anual, con una extinción prevista en una media de 61 años. Esto justifica su inclusión en la lista de especies en peligro crítico de extinción según los criterios de la Unión Internacional para la Conservación de la Naturaleza y los Recursos Naturales (UICN). La disminución se debe mayormente al bajo índice de supervivencia de especímenes jóvenes y adultos, cuya

principal causa parece ser la captura incidental de las pesquerías. Es posible que la introducción de prohibiciones a los desechos de la UE acelere este proceso. Asimismo, la presión de los depredadores exógenos (no se evaluó hasta el momento ya que no hay suficientes datos demográficos de las colonias expuestas a esta amenaza) podría empeorar aún más la situación. Esta especie es actualmente una de las aves más amenazadas en la región paleártica occidental, lo que justifica que se la considere como una población prioritaria en el ACAP para su conservación.

RECOMENDACION

Que el GdTPEC solicite al Comité Asesor que:

1. Incluya la pardela balear (*Puffinus mauretanicus*) que se reproduce dentro del archipiélago de las Islas Baleares como una población prioritaria en el ACAP para la conservación de la especie.

Évaluation des populations prioritaires de l'ACAP – *Puffinus mauretanicus* (Puffin des Baléares) sur les îles Baléares

RÉSUMÉ

Les Puffins des Baléares (*Puffinus mauretanicus*) ne se reproduisent que sur l'archipel des Baléares (Méditerranée occidentale). De récentes analyses ont montré que leur population diminue d'environ 14 % par an, leur extinction étant prévue dans un délai moyen de 61 ans. Cela justifie pleinement son inscription à la liste des espèces gravement menacées selon les critères de l'IUCN. Leur déclin est dû en grande partie au faible taux de survie des adultes et jeunes adultes, dont la cause principale serait la capture accessoire dans les pêcheries. Le déclin pourrait être précipité par la mise en place de l'interdiction de rejets des pêcheries de l'UE. En outre, la pression de nouveaux prédateurs exotiques (non évaluée à ce jour car il n'existe pas de données démographiques sur les colonies exposées à cette menace) pourrait empirer la situation. Cette espèce d'oiseaux est désormais l'une des plus menacées dans le Paléarctique occidental et son inclusion dans les populations prioritaires de l'ACAP en termes de gestion de conservation mérite d'être considérée.

RECOMMANDATION

Que le GTSPC demande au Comité Consultatif :

1. d'inclure le Puffin des Baléares (*Puffinus mauretanicus*) se reproduisant sur l'archipel des Baléares dans les populations prioritaires de l'ACAP en termes de gestion de conservation.

1. BACKGROUND

The Balearic shearwater (*Puffinus mauretanicus*) was included as an ACAP species in 2012 (ACAP 2012). First classified as Critically Endangered in 2004, it is Europe's most endangered seabird. Balearic shearwaters breed in caves and crevices on remote cliff sites and islets throughout the Spanish Balearic archipelago in the western Mediterranean sea. Before human settlement of the islands the species is thought to have been more widespread and abundant, but is now restricted to sites relatively free from introduced predators (especially terrestrial mammals such as rats and cats) and human disturbance. Like its relative the Manx shearwater (*Puffinus puffinus*) breeding in the eastern Atlantic, this subterranean, nocturnally visiting procellariiform is otherwise relatively defenceless against predators on land (Ruiz & Martí 2004). Breeding is relatively early (eggs are laid in March or even late February), and most birds migrate out of the Mediteranean in June and early July after the breeding period. At this post-breeding time they concentrate in hot-spots off the Portugal and NW Spain, Brittany, and more diffusely across the north eastern Atlantic coasts (as far as Scotland and Norway) (Le Mao & Yésou 1993, Mouriño *et al*. 2004, Wynn et al. 2007, Guilford et al. 2012, Oppel et al. 2012). Birds return to the Mediterranean for the winter, visiting the colonies sporadically in what may be associated pair-synchronisation behaviour (Guilford et al., 2012). As in the Atlantic, Balearic shearwaters appear to be predominantly coastal water feeders, with sightings (Gutiérrez & Figuerola 1995, Abelló *et al*. 2003, Arcos *et al*. 2012a) and tracking studies (Ruiz & Martí 2004, Louzao *et al*. 2012, SEO/BirdLife 2014, Meier *et al*. 2015) suggesting that foraging is concentrated along the Catalan and Eastern Spanish coast, as well as around the Balearic archipelago. The species forages largely on small pelagic fish, particularly in winter (Gutiérrez & Figuerola 1995, Louzao et al. 2006), but associations with fishing vessels are common, and discards are thought to provide considerable resource, (Arcos & Oro 2002, Navarro *et al*. 2008).

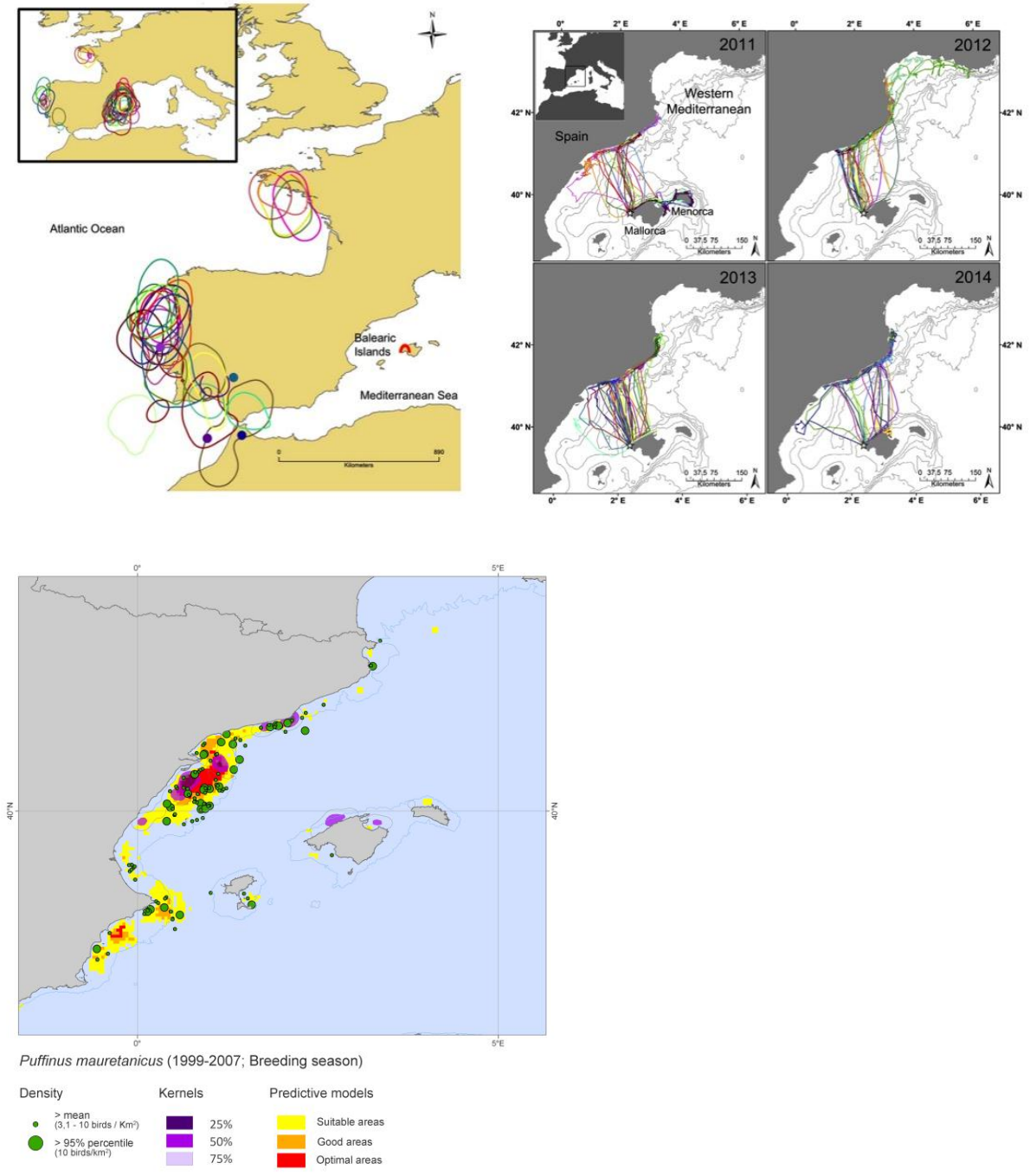

Fig. 1. *Upper left panel.* Kernel plots showing individual core activity areas for breeding birds tracked by GLS from Mallorca in 2011 (inset, all year; main map during Atlantic migration period only) (Guilford et al., 2012). *Upper right panel.* Four years of GPS tracking of breeding birds showing consistent commuting from Mallorca to coastal foraging areas off the mainland Spanish coast, and to a lesser extant around the Balearic islands (Meier et al., 2015). *Lower panel*. Core areas of distribution during the breeding period according to data from boat surveys (green circles proportional to estimated densities), tracking (Kernel plots in purple) and habitat models based on boat survey data (increasing in suitability from yellow to red) (Arcos et al. 2009).

2. DEMOGRAPHY

Because of the Balearic shearwater's secretive nesting behaviour in inaccessible caves and in dispersed rock crevices, counts of breeding numbers provide uncertain estimates. Similarly, the species' high mobility, pelagic nature, and rarity have meant that at-sea counts are also relatively uncertain. There has also been only sporadic systematic monitoring of the species in recent years, likely because of lack of proper funding. In 2011 breeding numbers were estimated at 3200 pairs (official data from the Balearic Government, in Arcos 2011). However, recent at-sea and coastal surveys suggest a global population of 20,000- 30,000 individuals (Arcos et al., 2012b, Arroyo *et al*. 2014), so that with reasonable expectations of demographic structure the breeding population could be higher than expected from colony estimates, likely around 7000 breeding pairs in total (Genovart et al, 2016). Even so, the current estimated trends are not optimistic.

Indeed, recent analysis suggests that the global breeding population of *P. mauretanicus* is declining at about 14% per annum, making it one of the most threatened bird species in the western palearctic (Genovart *et al*. 2016). This analysis was based on measurements at one of the largest known colonies, at Sa Cella on Mallorca, which is legally protected and where threats from both introduced predators (not present) and harvesting are well controlled. Nevertheless, adult survival at Sa Cella based on approximately 30 years of monitoring data is estimated at 0.809 (95% CI 0.782-0.833), with immature (1-2 year old) survival estimated at 0.434 (95% CI 0.351-0.520). Current breeding success is estimated at 0.665 (+/- 0.134), but is projected to be lower than this (0.433 +/- 0.137) with the introduction of EU discard bans, at least in the short term. For a long-lived, slow breeding procellariiform these values are very far from sustainable, and multievent capture-recapture population modelling shows that the population will be extinct within about 60 years (Genovart *et al*. 2016). This analysis updates but is substantially in accordance with earlier estimates of population viability (Oro *et al.* 2004). At that time the average extinction time was estimated at slightly over 40 years, but this was based on the assumption of a smaller population of departure, which has turned out to be wrong (new estimates are likely the result of better assessment, rather than any real population increase). The main reason for this decline is the recently confirmed very low adult and immature survival in the study population at Sa Cella (Genovart *et al*. 2016), which themselves probably represent an optimistic view for the population in the archipelago as a whole where threats at colonies are more prevalent. Otherwise there is no reason to believe that the demographics of, and threats to, birds at the Sa Cella colony are unrepresentative of the population across the Balearic archipelago as a whole.

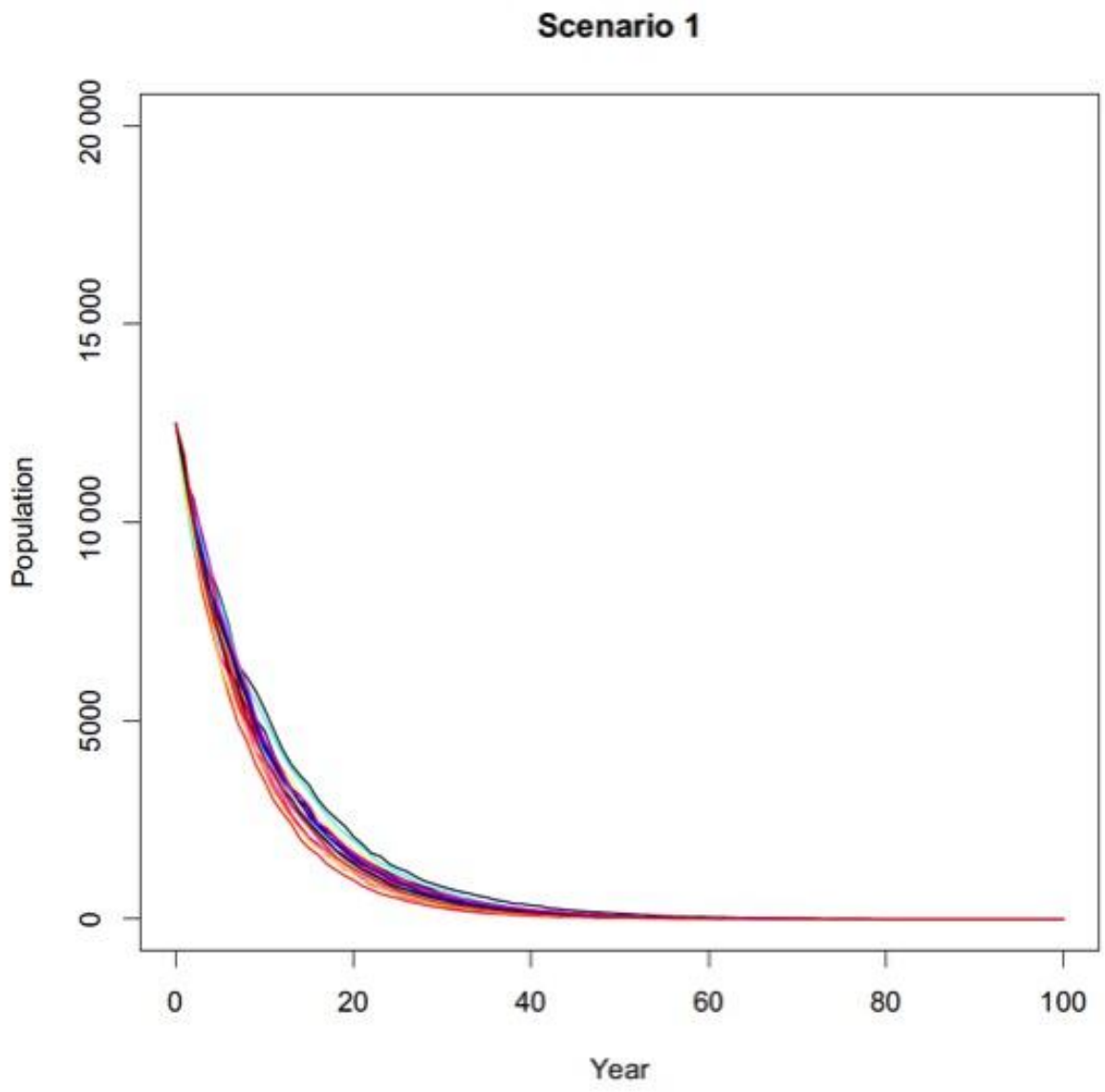

Fig. 2. Multiple runs of stochastic population model using current estimates of survival and productivity. Population extinction is inevitable under the current circumstances, with a mean time to extinction of 61 years (Genovart et al. 2016).

3. INTERACTION WITH FISHERIES

Although numerous risks exist to the sustainability of the Balearic shearwater population (Oro et al. 2004, Ruiz & Martí 2004, Arcos 2011), including Introduced mammalian predators, development, and competition with human fisheries, the overwhelming threat is fisheries' bycatch (Arcos *et al*. 2008, Louzao *et al*. 2011, ICES 2013, Oliveira *et al.* 2015, Genovart *et al*. 2016).

Balearic shearwaters are attracted to fishing vessels and likely benefit from additional forage provided by discards and baits, which may lead to increased breeding success (Arcos & Oro 2002, Louzao *et al.* 2006b. Nevertheless, bycatch in fishing gear is also thought that the biggest single threat to the global population of Balearic shearwaters. Genovart *et al* (2016) estimate that about 45% of adult mortality is caused by incidental capture in fishing gear. In

the Mediterranean, around the breeding colonies and along the Catalan coast where breeding birds predominantly forage (e.g. Meier et al., 2015 & Fig 1), data from animals handed in to rescue centres and from a small number of ringed animals surrendered voluntarily by fishermen both concur to suggest that around half of known mortality comes from capture on hooks most probably during the setting phase of demersal longline fishing (evidence from hook damage plus direct reporting by fishermen). Recent experimental evidence suggests that night-setting of longlines is an effective measure against this form of bycatch (probably because Balearic shearwaters habitually dive only during the day: Meier et al., 2015), and that it does not seem to reduce fishing catch (Gonzalez-Solis & Cortés 2015). Previous studies had reached a similar conclusion regarding the effectiveness of this measure in terms of bycatch reduction, although marginally lower catches were reported (Sánchez & Belda 2003). Bycatch is also recorded in other fishing gear types, especially during the post-breeding phase when birds exit the Mediterranean to spend the late summer at or more hotspots off the coasts of Portugal and southern Brittany in France (ICES 2013, SEO/BirdLife 2014, Oliveira et al. 2015). Here, the principal sources of bycatch may be purse-seiners, although long-liners might also play a significant role, and trawlers and set-nets could also be involved. However, estimates are still patchy since observers' effort has been relatively low and, as occurs in the Mediterranean (Arcos *et al*. 2008, Louzao *et al*. 2011), bycatch may sometimes be concentrated into rare but large capture events (Oliveira *et al*. 2015). Genovart *et al*. (2016) modelled the effects of currently estimated bycatch by removing it from population models whilst keeping other factors constant. The result is a reasonable prospect of population recovery (Figure 3) which would be substantially improved with additional positive inputs such as closer to optimum breeding success (attained e.g. through reducing predation at colonies), or reduced dependence on discards should Mediterranean fish stocks recover.

Addressing the problem of bycatch throughout the species' distribution range should be the first conservation priority, and involves the evaluation of the problem in fisheries/regions little studied so far, and the development and implementation of mitigation measures wherever the problem has been identified. Night setting appears to be a promising measure for demersal longliners, although other approaches under current investigation might also be effective, particularly those directed at modifying the gear configuration to ensure a fast sinking of the hooks. For other gears, far more research on mitigation measures is needed.

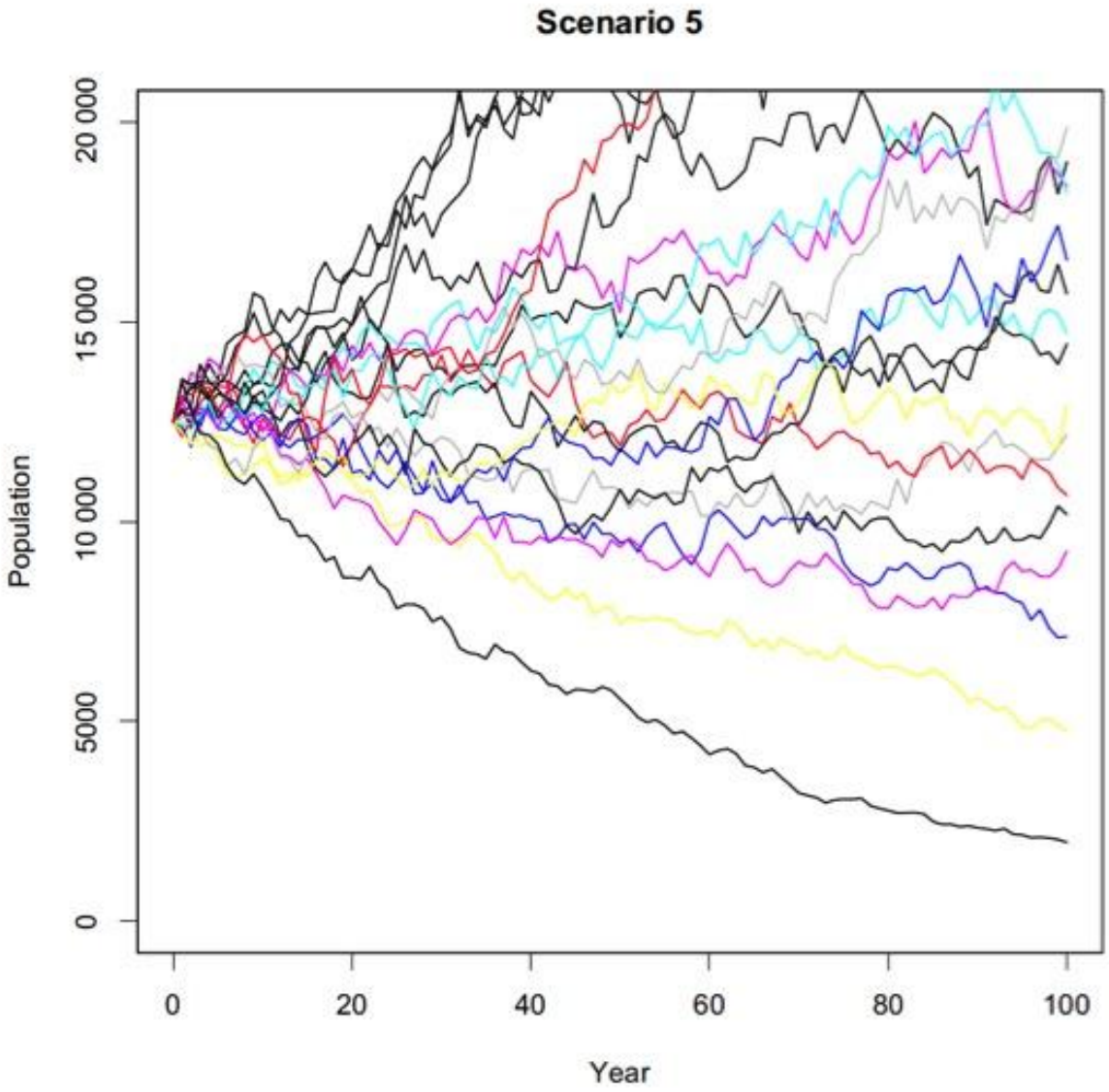

Fig. 3. Multiple runs of stochastic population model using current estimates of productivity, but with survival estimates augmented by removal of bycatch. Population extinction is much less likely, and recovery predicted in a majority of runs (Genovart *et al*. 2016).

4. CONCLUSIONS

Balearic shearwaters breeding in the Balearic archipelago are showing precipitate population decline, with an estimated reduction of about 14% per annum. Thus, conservation action is urgently needed for the species, both in the breeding grounds and, most important, at sea. Although there are other important threats to this restricted species, especially human development and predation at colonies by introduced mammalian predators, by far the major cause of decline is fisheries' bycatch. In the Mediterranean, demersal longliners are probably the most significant cause of adult and young adult mortality, whilst in the Atlantic during migration there are additional threats from other gear types. To all these efforts should be added the need of a proper monitoring of the species in the breeding grounds, to ensure a proper assessment of the trends and the impact of conservation measures on them. This

population is now perhaps the most endangered avian population in the western palearctic, and could both greatly benefit from, and deserves, listing as a priority for conservation management by ACAP.

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