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ADRIATIC SEA:

STATUS AND CONSERVATION OF SEABIRDS

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1. INTRODUCTION

One of the main characteristics of the Mediterranean marine avifauna is the high number of endemic taxa, despite the low diversity and small population densities; this is consistent with a low-productivity ecosystem compared to open oceans (Coll *et al*. 2010). All four Procellariiforms (petrels and shearwaters) present in the Mediterranean constitute endemic taxa: two at species level (*Puffinus mauretanicus* and *Puffinus yelkouan*) and two at subspecies level (*Calonectris diomedea*, *Hydrobates pelagicus melitensis*). Besides, one endemic cormorant (Shag *Phalacrocorax aristotelis desmarestii*), three gulls (Mediterranean *Larus melanocephalus*, Audouin's *Larus audouinii* and Yellow-legged *Larus michahellis michahellis*) and one tern (Lesser-crested *Sterna bengalensis emigrata*) also originate from the Mediterranean region.

Another characteristic of the Mediterranean marine avifauna is its long-term exposure to human influence. Through history, some aspects of human activity have had positive effects on seabirds (e.g. the creation of specific habitats like rice fields and salt pans, the provision of food through fishing discards, etc.) but overall and in the long-term the result of the human-seabird interaction has been detrimental for seabirds. Although there have been no extinctions since the Pleistocene, the current population size of most, if not all, Mediterranean seabird species is probably much lower now than it must have been before the arrival and spread of humans.

Today, despite the legal protection and the positive management of seabird colonies, several threats imperil the future of this unique seabird community, namely the interaction of seabirds with fisheries (causing unnecessary mortality and impacting heavily on their populations), overfishing (which decimates fish populations and heavily alters the habitats where marine organisms live) and climate change (causing disruptions in the ecosystem).

The Protocol Concerning Mediterranean Specially Protected Areas and Biological Diversity in the Mediterranean has two powerful tools to revert the negative trends of most Mediterranean seabird species: the establishment of a Specially Protected Areas of Mediterranean Importance (SPAMIs) list, and the protection and conservation of the species. This report focuses on the seabird species that: (a) are listed among the 25 of Annex II List of Endangered or Threatened Species; and (b) are present in our focus area, the Adriatic Sea (fig. 2).

The Adriatic Sea is an enclosed water mass in the relatively impoverished Mediterranean Sea. Its oceanography is dominated by shallow depths (average of ca. -250 m) and the discharge of rivers concentrated on the north western coast (the Po amounts to 28% of the total discharge). It is a biologically distinct and a hotspot of diversity for many taxa, although the seabird community in the Adriatic Sea only represents a small fraction of all the seabirds found in the Mediterranean. The small size and the absence of significant oceanographic features in the Adriatic explain the small size of its seabird populations. However, given the high level of endemism of the Mediterranean seabird fauna and its conservation value, those populations need to be maintained for strategic reasons.

2. MAIN SPECIES

***Puffinus yelkouan* – Yelkouan shearwater**

General overview and Taxonomy

The Yelkouan shearwater is a medium-sized Procellariiform strictly endemic to the Mediterranean (including the Black sea). It is of similar size and habits to the critically-endangered Balearic shearwater *Puffinus mauretanicus*. Until recently, both were considered to belong to the same species, but they have been separated based on differences in morphology, genetics, behaviour and ecology. The Yelkouan shearwater tends to form large flocks and only nests in a few colonies on offshore islets and rocky outcrops. It is exposed to predation on the breeding islands and to human-induced mortality at sea, mainly as a result of interactions with fisheries.

Presence in the Adriatic Sea

Yelkouan shearwater is present year-round in the Mediterranean, where it disperse widely in the non-breeding season; the population breeding in the Adriatic Sea is mostly found between June and October, when an estimated 2000 birds use it as a breeding and feeding area, particularly along the northwest and the Croatian coast (Bourgeois & Vidal, 2008). The breeding population is relatively small, with an estimated 350 – 500 breeding pairs in Croatia (Derhé 2012a), of which 150 – 200 breeding pairs in the Latsovo archipelago (Crnković 2012) and a few hundred pairs in the Tremiti islands of Italy (Bourgeois & Vidal 2008). The population thus probably consists mostly of local birds and is known to be declining (Derhé 2012a).

Foraging ecology and diet

Yelkouan shearwaters feed by surface-seizing and underwater pursuit, mainly on small pelagic fish such as sardines (family Clupeidae) and anchovies (family Engraulidae). Like for other shearwater species in the Mediterranean, discards from fisheries (mostly trawlers) are probably important, and may represent more than an opportunistic resource. Outside of the breeding season, Yelkouan shearwaters tend to concentrate in areas with large shoals of sardines and other Clupeiforms.

At-sea distribution

The species occupies the coastal area and feeds mainly in the shore near shore (Péron *et al.*, 2012), but is also known to forage in frontal areas (Beaubrun et al. 2000), where it can feed naturally or attend trawlers in search of discards. In fact, most birds observed in the open sea in other parts of the Mediterranean are travelling, which might suggest that there is little feeding in truly offshore waters, but the evidence that individuals of this species get

caught in pelagic longlines (Bourgeois & Vidal 2008) indicates that some degree of foraging also takes place away from the coast. This distinction may not be so relevant in the Adriatic Sea, where distances are smaller.

Conservation status (IUCN) and threats

Derhé (2012a) has assessed the global population of *Puffinus yelkouan* and estimated it to be 46,000-92,000 individuals. However, very high non-breeding season numbers reported in the Bosporus suggest that there may be a large percentage of non-breeding birds in the population and estimates of breeding numbers at colonies may be underestimated. It is predicted that the global breeding population is suffering a rapid decline of c.50% over three generations (54 years) – a considerably higher rate of decline than was previously predicted. As such, the species' global Red List status has now been revised to Vulnerable based on the findings of Derhé (2012a).

Yelkouans face specific threats on land and at sea. Breeding colonies are gravely affected by predation from alien invaders, mostly rats and cats. Several projects have been directed at addressing this issue and some are still ongoing targeting a reduction or even the eradication of alien predators. Dead shearwaters are regularly found in drift- and gill-nets and, more recently, in longlines. At-sea mortality is a major cause of the dramatic decline of the closely related *P. mauretanicus* and may be similarly affecting *P. yelkouan*. Breeding success may be affected by reduced abundance of anchovies and sprats due to competition from fisheries. Oil spills are an increasing risk due to increased maritime traffic in the Mediterranean.

International measures of protection

Puffinus yelkouan is listed in Annex I of the European Directive 2009/147/EC on the conservation of wild birds. It has been proposed as a candidate species for listing in Annex I of the Agreement on the Conservation of Albatrosses and Petrels, ACAP (Cooper & Baker 2008, ACAP 2013). It is listed in Annex II of the SPA/BD Protocol of the Barcelona Convention and in Appendix II of the Berne Convention.

National measures of protection

In the Adriatic Sea, the Italian Isole Tremiti - IT9110040 SPA covers 342 ha of land and the Tremiti islands IBA extends 3.21 km2 around the islands, taking in coastal waters. The Natura 2000 official files estimate a breeding population of 150 breeding pairs (2000) for the Tremiti Is.

Puffinus yelkouan is also legally protected in Croatia, where two SPAs have been designed for the protection of *Puffinus yelkouan* and other species: Lastavsko otočje (HR1000038, 196 km2, of which 73.13 are marine) and Pučinski otoci (HR1000039, 126.8 km2 of which 20.08 % marine). Both SPAs concentrate 100% of the known breeding population of *Puffinus yelkouan* in Croatia; the protection of their feeding areas is awaiting more precise knowledge.

Calonectris diomedea – Cory's shearwater

General overview and Taxonomy

Cory's is the largest Procellariiform species in the Mediterranean Sea, where it is still quite numerous (recent estimate for total breeding population: 142 478 – 222 886 breeding pairs, Derhé 2012b). The Mediterranean race *C. d. diomedea* is endemic and is currently declining over the whole range; possibly, at a faster pace than the Atlantic subspecies *C. d. borealis*. Cory's shearwaters make the longest foraging trips of all Mediterranean seabirds, and birds from distant breeding colonies often converge spatially. It regularly attends trawlers and longline vessels, and is the species suffering the heaviest mortality toll. Globally, it is considered of Least Concern (LC) under IUCN criteria because the world population is very large (possibly 900 000 – 1200 000 individuals, BirdLife International 2013) and recorded declines in the Atlantic still situate the species below the thresholds for threatened status.

Calonectris diomedea (Hazevoet 1995) was split by Sangster et al. (1998) into *C. diomedea* and C*. borealis* and this view has been followed by the Taxonomic Sub-Committee of the BOU Records Committee relating to the British List (Sangster et al. 2012). However, this treatment is not followed by the BirdLife International Taxonomic Working Group because morphological and genetic differences between the two taxa are slight, similarly large divisions exist within *diomedea* as between *diomedea* and *borealis* and qualitative differences in voice do not necessarily amount to isolation mechanisms.

Presence in the Adriatic Sea

Cory's shearwaters are present in the Adriatic Sea between March and October. Breeding occurs in two Croatian island groups (State Institute for Nature Protection, 2014), the Lastovo archipelago (400 – 500 breeding pairs) and the Vis archipelago (300 - 700 pairs), and the Termite islands of Italy, where an estimated 400 breeding pairs nest (BirdLife International 2013). They forage extensively over the mid-Adriatic basin and North to reach the productive waters of the Gulf of Venice. *Calonectris* populations are declining throughout the entire Mediterranean range, with an estimated 10-40 % decline in Croatia (Derhé 2012a).

Foraging ecology and diet

In the Mediterranean, Cory's shearwater feeds on medium-sized to small fish (regularly, sardine and anchovy), alone or in association with tuna and cetaceans. Squid is also an important component of its diet. It regularly attends trawlers when these are available, shifting to longline vessels when they are not, particularly during the pre-breeding and chick-rearing periods (Laneri et al. 2010). Fishing discards, a predictable source of food, have become a growing foraging option for Cory's shearwaters in the Mediterranean after the population decline of tuna and cetaceans, and the reduced availability of natural prey caused by overfishing. This increases the dependence of shearwaters on human activities, as the birds become attracted to fishing vessels, and modifies their foraging behaviour (Bartumeus et al. 2010).

At-sea distribution

When not in the vicinity of the breeding colony, Cory's shearwater is a true pelagic bird with a preference for offshore waters over the continental shelf and around the shelf break. Where large-scale fishing exists, foraging birds tend to aggregate in areas of high trawler densities along frontal systems (Louzao et al. 2009). Tracking reveals the non-random use of space during foraging trips.

Fig. 1. Shows 50%, 75% and 95% kernels of GPS positions of foraging Cory´s shearwaters from the islands of Tremiti in the Adriatic Sea during incubation in 2009-2010 (26 birds) (Cecere et al. 2012)

Conservation status (IUCN) and threats

Considering the species globally, Cory's shearwater does not approach the thresholds for IUCN threatened status (BirdLife International 2013), even though there is evidence of ongoing declines in several of its populations. The Atlantic population (mostly in Azores, Madeira and Canary Is.) is still very large; however, evidence amounts that the endemic Mediterranean subspecies is declining, probably through its entire range, although data for key sites is still lqcking (Derhé 2012b).

As with other Procellariiforms, the threats for Cory's shearwaters in the central

Mediterranean come both from land and sea. At the breeding colonies, introduced cats and rats prey on eggs and small chicks, reducing breeding success significantly where they are present. The situation in the W Mediterranean, where several studies indicate that this is the species suffering the heaviest mortality from bycatch in longline fisheries, both demersal and pelagic (Belda & Sánchez 2001, Cooper et al. 2003, Laneri et al. 2010, Igual et al. 2009, García-Barcelona et al. 2010), probably also extends to other parts of the Mediterranean.

International measures of protection

Annex I of the European Directive 2009/147/EC on the conservation of wild birds lists *Calonectris diomedea* (all subspecies). The species has been recommended for listing under the Agreement on the Conservation of Albatrosses and Petrels ACAP, together with the other Mediterranean shearwaters (Cooper & Baker 2008). Cory's is also listed in Annex II of the SPA/BD Protocol of the Barcelona Convention and in Annex II of the Berne Convention.

National measures of protection

In the Adriatic Sea, the Italian *Isole Tremiti - IT9110040* SPA covers 342 ha of land and the Tremiti islands IBA extends 3.21 km^2 around the islands, taking in coastal waters. Its population estimate for Calonectris diomedea is 400 breeding pairs.

Two sites have been designated as SPA for the protection of *Calonectris diomedea* and other species under the Birds Directive (State Institute for Nature Protection, 2014), *Lastovsko otočje* (196 km^2, of which 73.13 are marine) and *Pučinski otoci* (HR1000039, 126.8 km^2 of which 20.08 % marine). Together, both SPAs hold 100% of the known breeding nests of *Calonectris diomedea* in Croatia. The protection of their feeding areas at sea is awaiting more precise knowledge.

3. ADDITIONAL SPECIES

Phalacrocorax aristotelis desmarestii – Mediterranean shag

The Mediterranean shag forms an endemic subspecies and is a flagship species for Mediterranean seabird conservation. It is listed in Annex II of the SPA/BD and is legally protected in Italy and Croatia. The Red Data Books of both countries list the Mediterranean shag as Vulnerable (VU) under IUCN criteria.

The Shag feeds by diving underwater for fish (mostly, non-commercial species); it selects shallow waters (generally <80 m deep) and shows a preference for foraging over *Posidonia* sea beds. The species therefore remains mostly in coastal waters and does not venture far offshore. In the Adriatic Sea, the population tends to concentrate on the central and northern coasts. The important population in Croatia is estimated at 900 pairs (Pavoković 2011), with significant colonies on the Rovinj Islands (70 pairs), Brijuni Islands (232 pairs), Oruda - Palacol (197 pairs), Morovnik (39 pairs), and Silbanski Grebeni (254 pairs) (Škornik et al. 2012). Further south, 50 – 80 breeding pairs are estimated on Lastovo island (Crnković 2012). After the breeding season, large numbers gather in the Gulf of Trieste (e.g., 1000 – 1200 individuals in the Sečovlje saltpans IBA, Slovenia (BirdLife International 2013).

Larus audouinii – Audouin's gull

Audouin's gull is another flagship species for the conservation of Mediterranean seabirds. It is endemic and considered Near Threatened (NT) globally because its population size has increased substantially since the 1970s but still remains localised and is dependent on current fishing practices that make large quantities of discards available but are unsustainable (BirdLife International 2013). It is anticipated that a collapse in the fisheries would induce a population decline of *Larus audouinii*. For these reasons, it is legally protected in most countries in the area considered. Internationally, it is listed in Annex I of the European Directive 2009/147/EC on the conservation of wild birds, in Annex II of the SPA/BD Protocol of the Barcelona Convention, in Annex I of the UNEP-Bonn Convention on Migratory Species, in the African-Eurasian Waterbird Agreement (AEWA) and in Annex II of the Berne Convention.

The world population of Audouin's gull is estimated at <60,000 individuals; 90% of the breeding population is found in only 4 sites, and 70% concentrate in a single site (Ebro delta). The species scavenges around fishing vessels, and uses discards extensively and very efficiently. The species' association with fisheries is more pronounced in the western than in the central and eastern Mediterranean. In the Adriatic Sea, there a few scattered colonies on the coasts of Croatia (40 – 45 breeding pairs on Lastovo: State Institute for

Nature Protection, 2014) and the total breeding population is probably around 60 - 70 breeding pairs (Tutiš *et al.*, 2013).

4. IMPORTANT AREAS FOR THE CONSERVATION OF SEABIRDS IN THE ADRIATIC SEA

The following information is merely provisional because it shows the areas where seabirds are known to occur in relevant numbers in the area. It is widely accepted that the identification of important areas for seabirds cannot be done on seabird distribution alone; in order to be certain that such areas are predictable over time, other factors must be taken into account – oceanography, reliability of biomass distribution, presence of other predators. Therefore, the following areas are proposed pending confirmation after the information from other contractors is pulled together during the foreseen workshop.

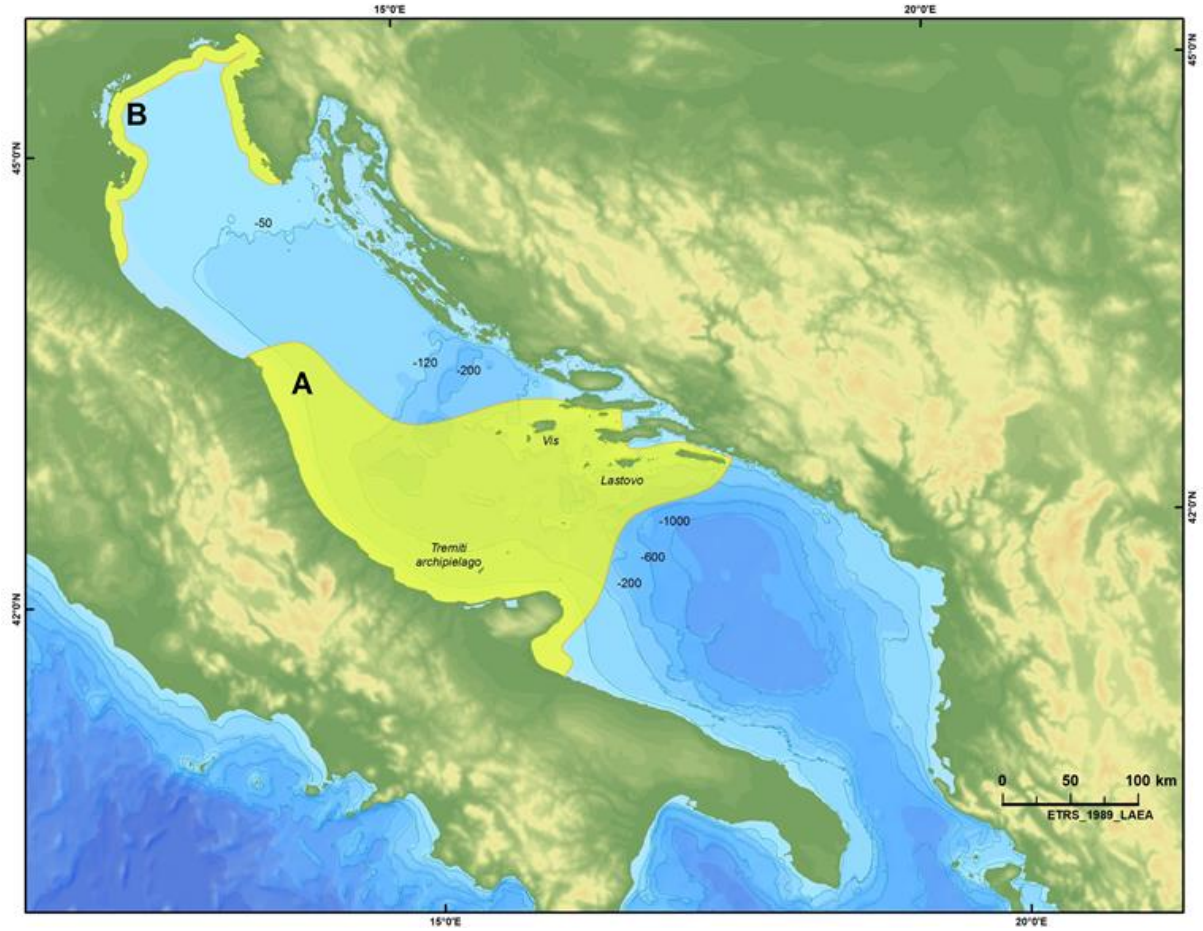

Fig. 2. View of the study area (Adriatic Sea), showing the Important Areas for the conservation of seabirds proposed – A: Central Adriatic Sea, B: Northern Adriatic Sea. By S.Requena (2015) for RAC/SPA.

A) CENTRAL ADRIATIC SEA

This area of relatively high primary productivity in the context of the Adriatic Sea encompasses the breeding and at-sea distribution of the only two pelagic species that occur in the Adriatic, Cory´s shearwater *Calonectris diomedea* and Yelkouan shearwater, *Puffinus yelkouan*. Evidence shows that the birds nesting in the Tremiti and Lastovo and Vis archipelagos feed mostly along the Italian coast. Much commuting probably occurs between that coast and the Croatian islands.

B) NORTHERN ADRIATIC SEA

This area is important for coastal species – gulls, terns and Mediterranean Shag *Phalacrocorax aristotelis*. The latter concentrates there in large numbers after breeding. Given the high productivity of the area, which is also a nursery for pelagic fish, it is thought that some feeding of Yelkouan shearwater (and possibly even Cory´s) must probably occur, but this is not documented. The same is true for Audouin´s gull *Larus audouinii*, which breeds in the Adriatic in very small numbers. The outer limit has been tentatively set at 5 nm offshore, pending confirmation from other sources.

REFERENCES

ACAP. 2013. Agreement on the Conservation of Albatrosses and Petrels – Report of the Seventh Meeting of the Advisory Committee. La Rochelle, France, 6 – 10 May 2013.

Bartumeus, F., Giuggioli, L., Louzao, M., Bretagnolle, V., Oro, D. & A. Levin, S.A. 2010. Fishery Discards Impact on Seabird Movement Patterns at Regional Scales. Current Biology, 20 (3): 215-222, doi: 10.1016/j.cub.2009.11.073.

Beaubrun, P., David, L., Rufray, X. & Conejero, S. 2000. Offshore distribution of breeding seabirds in the continental margin of the northwestern Mediterranean Sea, from Valencia to Rome in July 1993. In: Yésou P. and Sultana J. (Eds.). 2000. Monitoring and Conservation of Birds, Mammals and Sea Turtles of the Mediterranean and Black Seas. Proceedings of the 5th MEDMARAVIS Pan-Mediterranean Seabird Symposium, Gozo, Malta, October 1998. Environmental Protection Dpt, Malta. 320 p.

Belda, E. J., & Sánchez, A. 2001. Seabird mortality on longline fisheries in the western mediterranean: Factors affecting bycatch and proposed mitigating measures. Biological Conservation, 98(3), 357-363.

BirdLife International. 2013. IUCN Red List for birds. Downloaded from http://www.birdlife.org.

Bourgeois, K. & Vidal, E. 2008. The endemic Mediterranean yelkouan shearwater *Puffinus yelkouan*: Distribution, threats and a plea for more data. Oryx, 42(2), 187-194.

Cecere J.G., Gaibani G., Catoni C., Maggini I. & Celada C. 2012. Assessing key conservation areas for Italian Scopoli's Shearwaters *Calonectris diomedea* to identify marine IBAs. (Pp.9-15). In Yésou, P., Baccetti, N. & Sultana, J. (Eds.), Ecology and Conservation of Mediterranean Seabirds and other bird species under the Barcelona Convention - Proceedings of the 13th Medmaravis Pan-Mediterranean Symposium. Alghero (Sardinia) 14-17 Oct. 2011. Medmaravis, Alghero.

Coll, M., Piroddi, C., Steenbeek, J., Kaschner, K., Ben Rais Lasram, F. et al. 2010. The Biodiversity of the Mediterranean Sea: Estimates, Patterns, and Threats. PLoS ONE 5(8): e11842.

Cooper, J. & Baker, G.B. 2008. Identifying candidate species for inclusion within the Agreement on the Conservation of Albatrosses and Petrels. Marine Ornithology 36: 1–8.

Cooper, J., Baccetti, N., Belda, E.J., Borg, J.J., Oro, D., Papaconstantinou, C., Sanchez, A. 2003. Seabird mortality from longline fishing in the Mediterranean sea and Macaronesian waters: A review and a way forward. Scientia Marina, 67(S2), 57-64.

Crnković, R. 2012. Present situation of the population of seabirds (*Calonectris diomedea*, *Puffinus yelkouan*, *Phalacrocorax asistotelis desmarestii*, *Larus audouinii*, *Larus michahellis* and *Sterna hirundo*) breeding at Lastovsko otočje nature park, Croatia. (pp. 221-222). In

Yésou, P., Baccetti, N. & Sultana, J. (Eds.), Ecology and Conservation of Mediterranean Seabirds and other bird species under the Barcelona Convention - Proceedings of the 13th Medmaravis Pan-Mediterranean Symposium. Alghero (Sardinia) 14-17 Oct. 2011. Medmaravis, Alghero.

Derhé, M. 2012a. Developing a population assessment for Yelkouan Shearwater *Puffinus yelkouan* (Pp.65-73). In Yésou, P., Baccetti, N. & Sultana, J. (Eds.), Ecology and Conservation of Mediterranean Seabirds and other bird species under the Barcelona Convention - Proceedings of the 13th Medmaravis Pan-Mediterranean Symposium. Alghero (Sardinia) 14-17 Oct. 2011. Medmaravis, Alghero.

Derhé, M. 2012b. Developing a Population Assessment for Scopoli's and Cory's Shearwaters *Calonectris diomedea*/*Calonectris borealis*. (Pp.29-38). In Yésou, P., Baccetti, N. & Sultana, J. (Eds.), Ecology and Conservation of Mediterranean Seabirds and other bird species under the Barcelona Convention - Proceedings of the 13th Medmaravis Pan- Mediterranean Symposium. Alghero (Sardinia) 14-17 Oct. 2011. Medmaravis, Alghero.

Garcia-Barcelona, S., Ortiz de Urbina, J.M., de la Serna, J.M., Alot, E. & Macias, D. 2010. Seabird bycatch in Spanish Mediterranean large pelagic longline fisheries, 2000-2008. Aquatic Living Resources 23(4), 363-371.

Hazevoet, C. J. 1995. The birds of the Cape Verde Islands. Tring, U.K.: British Ornithologists' Union (Check-list 13).

Igual, J.M., Tavecchia, G., Jenouvrier, S., Forero, M.G., Oro, D. 2009. Buying years to extinction: Is compensatory mitigation for marine bycatch a sufficient conservation measure for long-lived seabirds? PLOs ONE 4: e4826

Laneri, K., Louzao, M., Martínez-Abraín, A., Arcos, J.M., Belda, E.J., Guallart, J., Sánchez, A., Giménez, M., Maestre, R. & D. Oro. 2010. Trawling regime influences longline seabird bycatch in the Mediterranean: new insights from a small scale fishery. Marine Ecology Progress Series 420: 241-252.

Louzao, M., Bécares, J., Rodríguez, B., Hyrenbach, K.D., Ruiz, A. and Arcos, J.M. 2009. Combining vessel-based surveys and tracking data to identify key marine areas for seabirds. Marine Ecology Progress Series 391: 183–197.

Pavoković, G. 2011. Terenska istraživanja morskog vranca *Phalacrocorax aristotelis desmarestii* (2011). Projektom «Istraživanja morskog vranca u sjevernom Jadranu – istraživanja u cilju očuvanja vrste sukladno Direktivi o pticama» financiranog od strane Ministarstva kulture tijekom 2011 godine. Udruga Animalia, Rijeka.

Péron, C., Grémillet, D., Culioli, J-M., Faggio, G., Gillet, P., Mante, A. & Vidal, P. 2012. Exploring marine habitats of two shearwater species breeding on French Mediterranean islands to identify Marine Protected Areas. (Pp.19-25). In Yésou, P., Baccetti, N. & Sultana, J. (Eds.), Ecology and Conservation of Mediterranean Seabirds and other bird species under the Barcelona Convention - Proceedings of the 13th Medmaravis Pan-Mediterranean Symposium. Alghero (Sardinia) 14-17 Oct. 2011. Medmaravis, Alghero.

Sangster, G., C.J. Hazevoet, A. B. van den Berg, C. S. Rosdaar. 1998. Dutch Avifaunal list: species, concepts, taxonomic instability, and taxonomic changes in 1998. Dutch Birding 20: 22-32.

Sangster, G., Collinson, M., Crochet, P.-A., Knox, A.G., Parkin, D.T. & Votier, S.C. 2012. Taxonomic recommendations for British birds: eighth Report. Ibis 154: 874-883.

Škornik, I., Utmar, P., Kravos,K., Candotto,S. & Crnković, R. 2012. Important post-breeding roosting area of Mediterranean Shag *Phalacrocorax aristotelis desmarestii* in Gulf of Trieste (N Adriatic). (Pp.117-120). In Yésou, P., Baccetti, N. & Sultana, J. (Eds.), Ecology and Conservation of Mediterranean Seabirds and other bird species under the Barcelona Convention - Proceedings of the 13th Medmaravis Pan-Mediterranean Symposium. Alghero (Sardinia) 14-17 Oct. 2011. Medmaravis, Alghero.

State Institute for Nature Protection. 2014. Standard Data Form for Natura 2000 sites. http://natura2000.dzzp.hr/reportpublish/reportproxy.aspx?paramSITECODE=HR1000038.

Tutiš, V., Kralj, J., Radović, D., Ćiković, D. i Barišić, S. 2013. Crvena knjiga ptica Republike Hrvatske [Red Data Book of Bids of Croatia]. Ministarstvo zaštite okoliša i prirode, Državni zavod za zaštitu prirode, Zagreb (in Croatian, with English summary).

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