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Marine Important Bird Areas (IBAs): towards the effective protection of seabirds at sea

José Manuel Arcos[1], Juan Bécares[1], Beneharo Rodríguez[1], Asunción Ruiz[1], Iván Ramírez[2], Patricia Amorim[3], Pedro Geraldes[2], Ana Meirinho[2], Vitor Paiva[2], Carlota Viada[1], Maite Louzao[4] & K. David Hyrenbach[5]

1 – SEO/BirdLife - C/Murcia 2-8, local 13, 08026 Barcelona, Spain
2 – SPEA - Avenida da Liberdade, nº 105, 2ºesq, 1250-140 Lisboa
3 – DOP - Departamento de Oceanografia e Pescas, Universidade dos Açores, Casi de Santa Cruz 9900-862 Horta, Faial , Açores, Portugal.
4 – Departamento de Biología de Organismos y Sistemas, Universidad de Oviedo, C/Catedrático Rodrigo Uría s/n, Oviedo 33071, Spain
5 - Duke University Marine Laboratory, Beaufort, NC 28516, USA

Corresponding author: jmarcos@seo.org

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Marine Protected Areas (MPAs) have traditionally targeted the protection of benthic habitats and their inhabitants (i.e. sessile and sedentary taxa), rather than wide-ranging organisms such as seabirds, marine mammals, sea turtles and large pelagic fish. Marine top predators have been particularly left aside given their high mobility, which in principle would require large areas to ensure their protection. Moreover, these organisms often associate with dynamic habitat features, such as oceanographic fronts and eddies, thus creating the impression that their distributions and aggregations at sea are highly variable over time.

Yet, conservation actions are urgently needed, given the wide array of large-scale anthropogenic threats that marine top predators face at sea (bycatch, overexploitation of fish stocks, pollution, habitat degradation) (Boersma et al. 2004, Lewison et al. 2004). Implementing effective management measures is in most cases unfeasible at a basin-wide scale, given the sheer size of the oceans. This has led to rethink in the MPA approach regarding these organisms, which seems now far more feasible that could have been expected (cf. Hyrenbach et al. 2000). Indeed, there is increasing evidence that marine top predators often assemble at specific marine areas (i.e., hot-spots) that are reasonably predictable, at least at mesoscale spatial scales (10s km). Conservation efforts that focus on habitat hot-spots (foraging and breeding aggregations, migration routes) may be therefore more effective. In particular, protective measures targeting these smaller-scale foraging / migration areas will be more easily enforceable and monitored than large-scale diffuse conservation initiatives.

BirdLife International is now extending its Important Bird Area (IBA) Program to the marine environment, as a first step in creating a potential network of protected areas for seabirds, which would also benefit other marine top predators and their underlying ecosystem. To this end, two BirdLife Partner organisations, SEO/BirdLife (Spain) and SPEA (Portugal), are leading the initiative of marine IBA identification, under the auspices of EC Life-Natura funding (2004-2008). These projects seek to develop the conceptual framework and analytical methodology needed to designate IBAs in the marine environment, paying particular attention to oceanic waters, with the ultimate aim of assembling a marine IBA inventory for Spain and Portugal. In the European context, marine IBAs are expected to contribute the *Natura 2000* at-sea network by being taken as a reference list in the designation process of Special Protection Areas (SPAs).

Three types of marine IBA types are regarded:

(1) Seaward extensions of breeding colonies. Their purpose is ensuring protection at sea around the breeding colonies, where seabirds occur in high densities, to complement protection inland. The sea surrounding a colony would be declared an IBA within a given radii, which would depend on the target species and the particularities of the site. For the most coastal species this approach could include foraging grounds adjacent to the breeding sites. For pelagic species (Fig. 1) they would only address the protection of the birds while flying in and out or rafting close to the colony, as their foraging grounds often lay 10s to 100s km from the breeding sites.

(2) At-sea congregations. Areas where seabirds predictably occur in relatively high numbers, usually for feeding. Pelagic (Fig. 1) and coastal areas tend to differ in their degree of seabird concentration and background densities at-sea, and are often regarded as two different types of IBAs.

(3) Migration corridors. The most conspicuous cases are narrow corridors (bottlenecks) defined by topographic and bathymetric features (e.g. straits, narrow shelves), such as the Straits of Gibraltar, which force large numbers of migrating seabirds into fairly restricted areas. Less obvious examples could be highly concurred flyways between the breeding colonies and the foraging areas (Fig. 1).

IBA designation is guided by empirical information on seabird distribution, driven by the collection of data using telemetry, data-loggers and at-sea surveys. The integration of data on seabird densities (from vessel-based surveys) and individual movements (from data-loggers) provides a very powerful approach to assess potential IBAs in the Western Mediterranean (Fig. 1). These distribution data are integrated with concurrent oceanographic and environmental datasets using multi-variate statistics to identify those habitat features that influence seabird distributions at-sea. This habitat modelling approach is critical, particularly given the dynamic nature of oceanic systems (Louzao et al. 2006).

Finally, this is important to stress that, beyond the identification and designation process, a complementary effort must be directed at identifying significant threats affecting seabirds within these marine key areas. This will be the only way of implementing effective management plans, which will be essential for the effective conservation of marine IBAs and the Marine Protected Area network of which they will need to form part.

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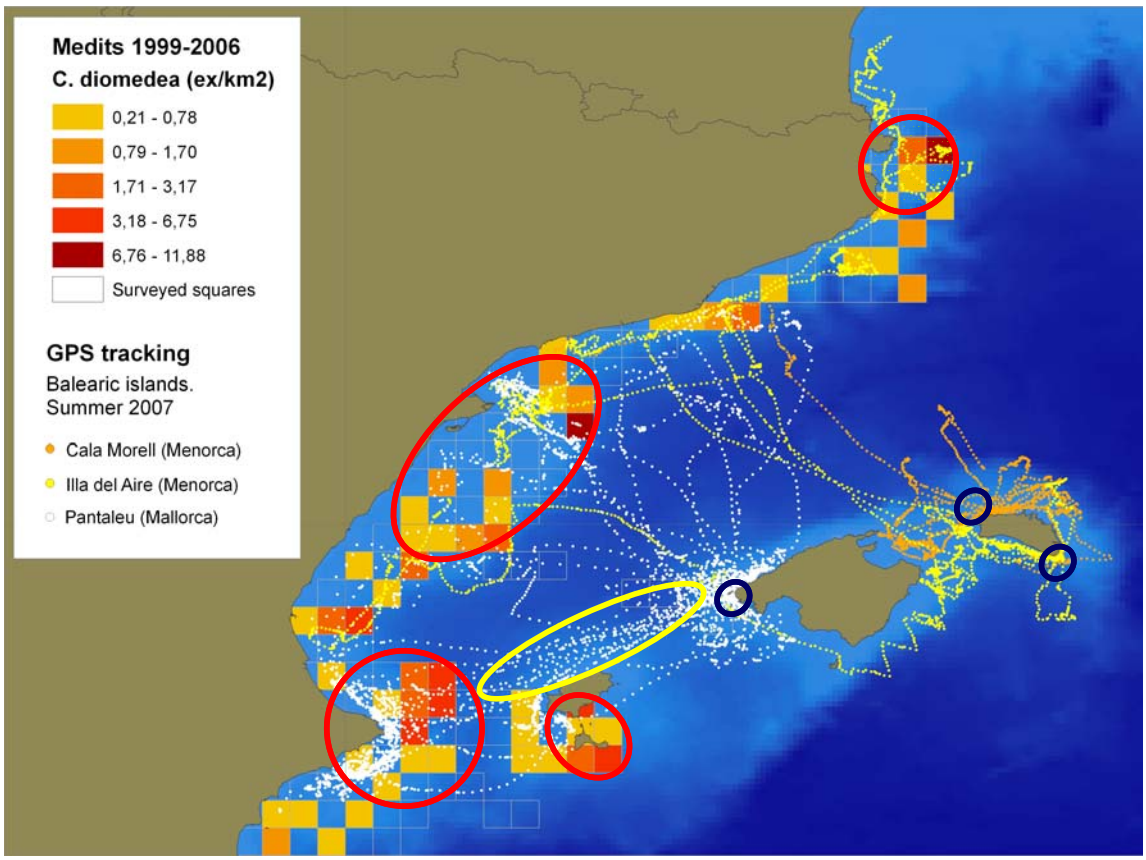

Fig. 1. Combination of boat survey data (densities averaged in 10x10 nautical miles squares) and GPS-loggers tracking data (foraging trips of breeding individuals) for the Cory's shearwater *Calonectris diomedea*, showing a coincidence in the most suitable areas in the NW Mediterranean. Potential examples of the three IBA types are highlighted (though their boundaries need to be delineated): (1) seaward extensions to breeding colonies (dark blue circles); (2) areas of congregation at sea (red line); and (3) flyways between the breeding colonies and the foraging grounds (yellow line).

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