Writing for #theBOUblog – your guide

IMPORTANT NOTE
Separate URL links are vital where requested for when your text is imported in to our HTML editor, all embedded links are lost.

Title
- Short and snappy (max. 6 words)
- Asking a question is good

Sub-title
- the sell – a snappy highlight or question to use to promote the article (max. 10 words)
- make sure you're not simply repeating the title as they will appear alongside each other

Your name (one person only)

Your institute (with URL to institute/department/lab website)

Main article text (500 – 1000 words)
- use short paragraphs
- embed links but provide the URL for each link in full in brackets after the embedded item (as per example below)
  - note: we do not link references within the text but link to each item listed within references/further reading section (see example below).

Linked paper
- Provide full reference in the following format:
  Article title. Author(s). Year. *Journal title*. DOI. (URL)
- see example below

References and/or further reading
- include links to online items
- add additional items such as blogs etc. not referred to but providing further reading
- see example below for format

Author biography (max. 100 words).
- inc. a <u>head and shoulders</u> photo of yourself (no birds/animals in shot)
  - max 250x250px and we will reproduced at 120x120px
- inc. your Twitter handle
- inc. link to your online profile

Images and figures
- inc. one we will use as the 'featured' imaged
  - we require 1 – 4 photos and/or figures to include within the blog
  - images need to be striking and recognisable
  - featured images need to reproduce well as a square (250x250px) and as a rectangle (900x300px) (rectangle can be a cut from a square image, does not have to be all of the image and vice-versa)
  - a good photo of a bird or other striking image is prefered
  - no graphs, etc for the opening image
  - all images should be saved at 1250 px wide

- add captions and credit (i.e. photographer) as a list at the bottom of your article
- DO NO NOT SEND LARGE IMAGE FILES
  - Images of 1250 px wide should be no more than 300kb when saved correctly for web viewing

See example below and recent blogs at http://www.bou.org.uk/blog/

EXAMPLE (see https://bou.org.uk/dias-following-seabirds/)

Tracking seabirds for science and for conservation

Scientists worldwide join efforts in unprecedented initiative to tackle major threats to seabirds.

Maria Dias
BirdLife International (http://www.birdlife.org/)

LINKED PAPER
Applying global criteria to tracking data to define important areas for marine conservation. Lascelles, B., Taylor, P., Miller, M., Dias, M.P., Oppel, S., Torres, L., Hedd, A., le Corre, M., Phillips, R.A., Scott, S., Weimerskirch, H. & Small, C. 2016. *Diversity and Distributions.* DOI: 10.1111/ddi.12411 (https://onlinelibrary.wiley.com/doi/abs/10.1111/ddi.12411)

Of the 359 species of seabirds, 159 (44%) are classified as globally threatened (i.e. Vulnerable, Endangered or Critically Endangered; IUCN 2015). This places this group amongst one of the most threatened of all birds (BirdLife International 2013). Pelagic species are particularly at risk – many populations of albatrosses, petrels and penguins have faced medium to severe declines over the last decades (Croxall et al. 2012). Two main threats have driven these declines: incidental bycatch in fisheries and the predation by introduced mammals at the colonies (usually islands; Žydelis et al. 2009, Anderson et al. 2011, Croxall et al. 2012). While the impact of the latter threat is relatively easy to quantify (and, to a certain extent, to address; e.g. Norton & Warburton 2014), identifying the magnitude and occurrence of at-sea mortality is far more challenging. Until very recently, we knew very little about the foraging ecology of most species – we simply didn't know where the birds were going to find food - so how could we quantify, and then tackle, their main at-sea threats?

[insert Fig 1]

In the last three decades the scientific community has witnessed an incredible advance in animal tracking technologies, and the consequent increase in the number of studies focusing on seabird foraging behaviours and migratory movements. Since the early 90s, when some pioneering studies appeared (e.g Jouventin & Weimerskirch 1990), hundreds of papers reporting tracking data have been published, and it's now clearly a dominant topic in seabird research. For example, at the 2nd World Seabird Conference held in Cape Town, South Africa (November 2015), ca. 30 % of the studies presented involved seabird tracking.

These studies have proved relevant to tackle the above mentioned conservation problems, and in 2004 BirdLife International created, the Tracking Ocean Wanderers – The Global Procellariiform Tracking Database. The aim was to establish a centralised database that could be used to understand the movements of albatrosses and petrels, identify areas where overlap with fishing effort was highest and help reducing their mortality due to by-catch (BirdLife International 2004). In an unprecedented response, scientists worldwide joined the initiative and contributed their datasets.

[insert Fig 2]

Ten years later, the database has been expanded to cover all seabird species – and is now a preeminent example of cooperation between scientists and conservationists. More than 150 researchers, from 22 countries, contribute their datasets. It now holds over 5 million data points for 85 species (plus 20 not yet shown online), with information in all ocean basins (Fig 3). Researchers maintain full control over their data; they can opt to have their data visible online (with or without zoom limitations), or to simply show a metadata table. And, most importantly, they are always consulted regarding any potential use of the data, either by BirdLife International or by any third party that might be interested in a scientific collaboration.

[insert Fig 3]

What do we do with these data?

Tracking data have proved to be a fundamental tool in seabird conservation (Burger & Shaffer 2008). Understanding the distribution patterns of individuals and populations is often the first step needed when attempting to address a certain threat. For example, identifying the overlap between the major world fishing fleets and albatross distribution was crucial to address the by-catch problem, and reduce it in some areas by more than 95% (Maree et al. 2014). Along with at sea-surveys, tracking studies are the most important source of data to map the at-sea range of seabird species, an essential layer of information in any Marine Spatial Planning exercise, or when identifying Marine Protected Areas (Lascelles et al. 2014).

However, analysing data collected from individual birds, and scaling that up to the population level, is a challenging exercise (e.g. Gutowsky et al. 2015). Birds from the same colony can choose distinctive sites to forage (between-individuals flexibility; e.g. Patrick et al. 2013), and even different individuals within a population can vary in the degree of faithfulness to their foraging sites (within-individuals flexibility; Dias et al. 2011, Wakefield et al. 2015). Recent evidence points to an extreme variability among species in this "flexible-consistent" axis of their foraging behaviour (Weimerskirch 2007, Wakefield et al. 2015), and sometimes we can find such variability even between different populations of the same species (e.g. in Black-browed albatrosses; Wakefield et al. 2011, Catry et al. 2013). To understand this in practical conservation terms, we need to assess medium to long term consistency in site use at the population level, case by case, and during different stages of the breeding cycle (e.g. Robertson et al. 2014). This requires long term studies (covering several years), at multiple colonies, which are unfortunately still missing in most cases. It also demands a collaborative effort to pool data – reinforcing, again, the utility of having a single repository of data collected by different research teams.

In an attempt to address these questions and boost the utilization of tracking data for conservation, BirdLife International, with the support of the scientific community, developed a unique tool to identify foraging hotspots from bird's individual locations (Lascelles et al. 2016). The tool is a combination of R scripts that can be applied to any dataset of seabird tracking, which characterises potential Important Bird and Biodiversity Areas (IBA - Fishpool & Evans 2001). It includes an objective approach to define species-specific smoothing parameters (*h* values) for kernel density estimation based on area-restricted search behaviour (Fauchald and Tveraa 2003), and an analysis to determine whether sites identified from tracked individuals are also representative for the wider population. The application of this approach to more than 60 species and 252 datasets (i.e., unique combinations of data collected for a certain species, in a given colony and breeding stage) resulted in the identification of more than 1000 IBAs (which can be seen at http://maps.birdlife.org/marineIBAs/default.html; Fig. 4). The total area of the IBAs identified during this analysis amounts to 4.3% of the world's oceans, the future protection of these sites would make a significant contribution to achieving Aichi target 11, which required the designation of 10% of the world's oceans as MPAs by 2020 (SCBD 2014).

[insert Fig 4]

With over 50% of the species assessed listed as Globally Threatened by IUCN, this network of IBAs, is of key important for marine conservation efforts. Together these sites show where species can be most effectively conserved as a group and where potential threats may have population level impacts. Best practice management of activities that negatively affect seabirds in these areas, such as through the designation of Marine Protected Areas, would make a vital contribution to the conservation of seabirds (and other marine life found in these areas) and prove once more that science-based conservation is the way forward to halt and reverse the declines many species have undergone in recent decades.

References

Anderson, O.R.J., Small, C., Croxall, J.P., Dunn, E.K., Sullivan, B.J., Yates, O. & Black, A. 2011. Global seabird bycatch in longline fisheries. *Endangered Species Research* 14: 91–106. View (http://m.thewww.rspb.org.uk/Images/n014p091_tcm9-289172.pdf)

BirdLife International. 2004. *Tracking ocean wanderers: the global distribution of albatrosses and petrels*. Results from the Global Procellariiform Tracking Workshop, 1–5 September, 2003, Gordon's Bay, South Africa. Cambridge, UK: BirdLife International. View (http://www.seabirdtracking.org/?q=trackingoceanwanderers_publication)

BirdLife International. 2013. State of the world's birds: indicators for our changing world. Cambridge, UK: BirdLife International. View (http://www.birdlife.org/datazone/userfiles/file/sowb/pubs/SOWB2013.pdf)

About the author

Maria Dias currently works as a marine analyst for BirdLife International, based in Cambridge, UK. After a PhD on conservation of estuarine areas for wintering and migrating shorebirds (in Tagus Estuary, Portugal), she did a post-doc research on individual flexibility of migratory behaviour of seabirds. In BirdLife International she's responsible for managing and analysing the data held in the Seabird Tracking Database (http://www.seabirdtracking.org/), and she's still collaborating with scientific projects involving seabird tracking carried out in Selvagens and Desertas, Portugal (Project Calonectris (https://sites.google.com/site/projectocalonectris/) and Project Bulweria (http://bulweria.wix.com/projectbulweria)).

View Maria's full profile (https://www.researchgate.net/profile/Maria_Dias11)

Image credit [for top feature image which does not carry a caption]
Black-browed albatross *Thalassarche melanophris* © Ben Lascelles

Image/figure captions:

Figure 1 Migratory movements of some shearwaters and petrels in the Atlantic Ocean. Data-contributors: April Hedd, Benjamin Metzger, Bill Montevecchi, Ivan Ramirez, José P. Granadeiro, Maria Dias, Paulo Catry, Richard Phillips and Vitor Paiva. All data stored in the Seabird Tracking Database (http://www.seabirdtracking.org/).

Figure 2 The Black-browed albatross *Thalassarche melanophris* is one of the most tracked of all seabird species. More than 1600 individual tracks, collected by 15 researchers at 11 different colonies, are currently held in the Seabird Tracking Database (http://www.seabirdtracking.org/). By studying their at-sea movements it is now possible to understand and address some of the major causes of their decline (see for example Granadeiro et al. 2011).

Figure 3 The Seabird Tracking Database (http://www.seabirdtracking.org/)stores currently data for 88 seabird species (belonging to 10 different bird families), collected by 120 researchers in 200 colonies worldwide. Almost 6 million bird locations can be searched using our mapping tool (http://seabirdtracking.org/mapper/index.php) .

Figure 4 More than 1000 marine Important Bird and Biodiversity Areas (IBA) have been identified with tracking data. The boundaries of these sites can be seen in the Marine IBA e-atlas (http://maps.birdlife.org/marineIBAs/default.html) mapping tool.