

# Seabird tracking data to inform marine conservation

Tammy Davies, Maria Dias, Carolina Hazin

 @BirdLifeMarine



**GOBI**

Supported by:  
  
Federal Ministry for the  
Environment, Nature Conservation,  
Building and Nuclear Safety  
  
based on a decision of the German Bundestag



# BirdLife International

## BIRDLIFE: A GLOBAL PARTNERSHIP FOR NATURE



Supporters  
7 million

Partner staff  
8,000

Members  
3 million

Local groups  
4,000

Partners  
121

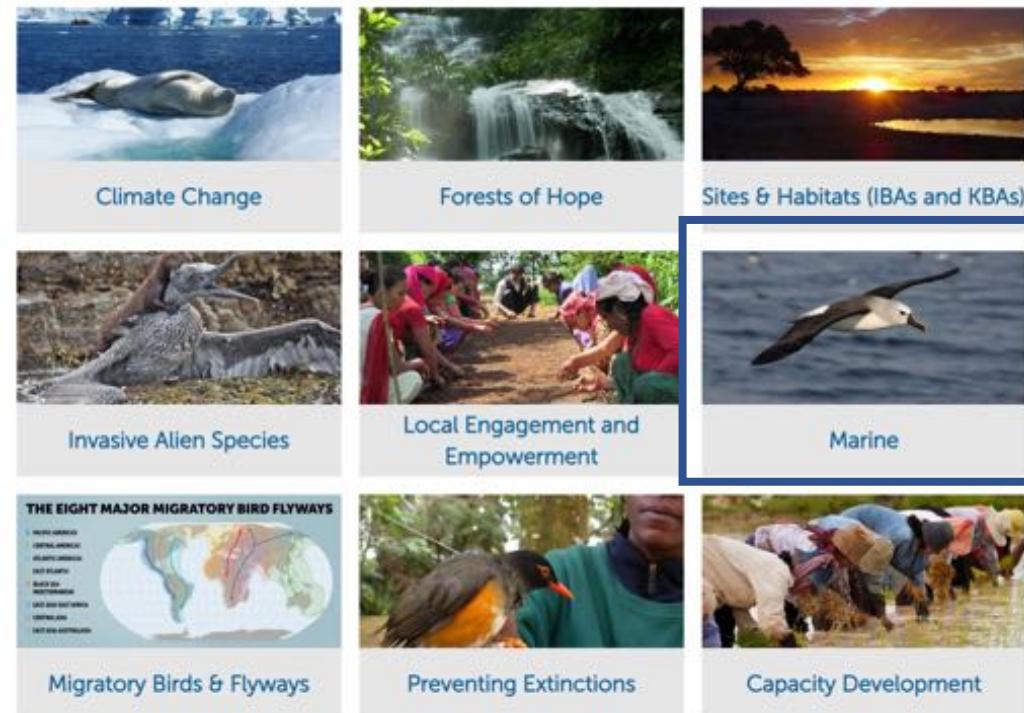
Ha of reserve  
4 million

Regional divisions  
6

—  
II



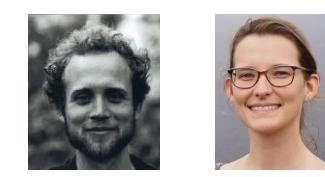
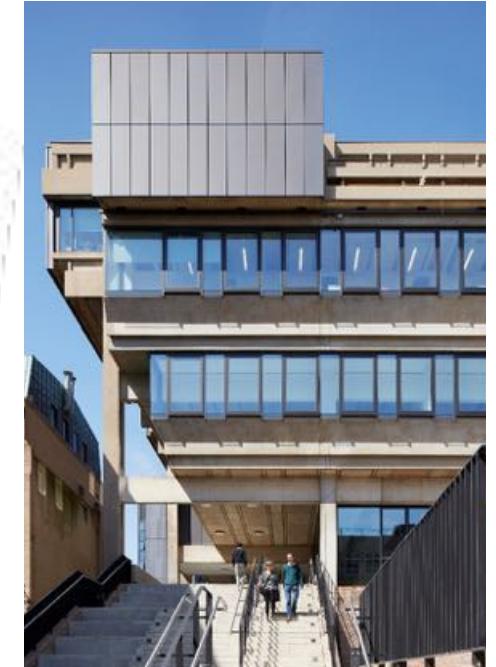
# BirdLife International



A collage of images related to marine conservation, including a gull in flight, researchers on a boat, a seal, and a fishing vessel at sea. The text "Sea change for the oceans" and "BirdLife International Marine Programme" is overlaid on the graphic.

**BirdLife INTERNATIONAL**  
Partnership for nature and people

**rspb** giving nature a home



# Seabird population declines



Wandering albatrosses on South Georgia Island (Credit: BAS/Richard Phillips)

# Seabird population declines



# Bycatch

Bycatch = the accidental capture of non-target species

Pelagic vessels deploy lines up to 80 miles (130 km) long, each with thousands of baited hooks

>1 billion hooks each year are set by the world's longline fleets



# Bycatch

Not only albatrosses...

- 30% of all seabird species (n=100/359) \*
- 12 families
- >160k (320k ?) birds/yr in longline fisheries\*\*
- >100k-200k birds/yr in gillnets\*\*\*

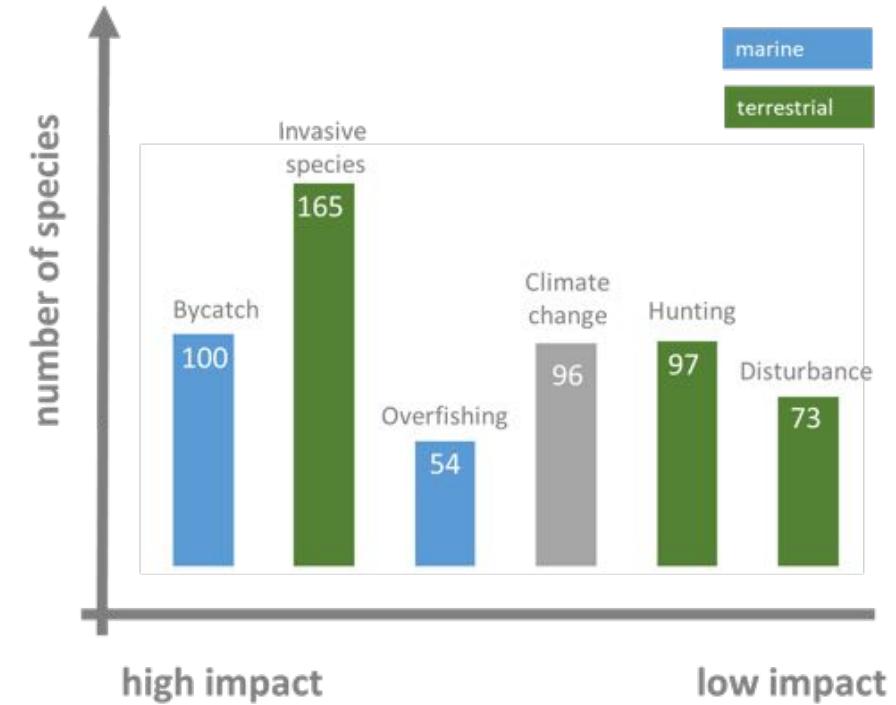
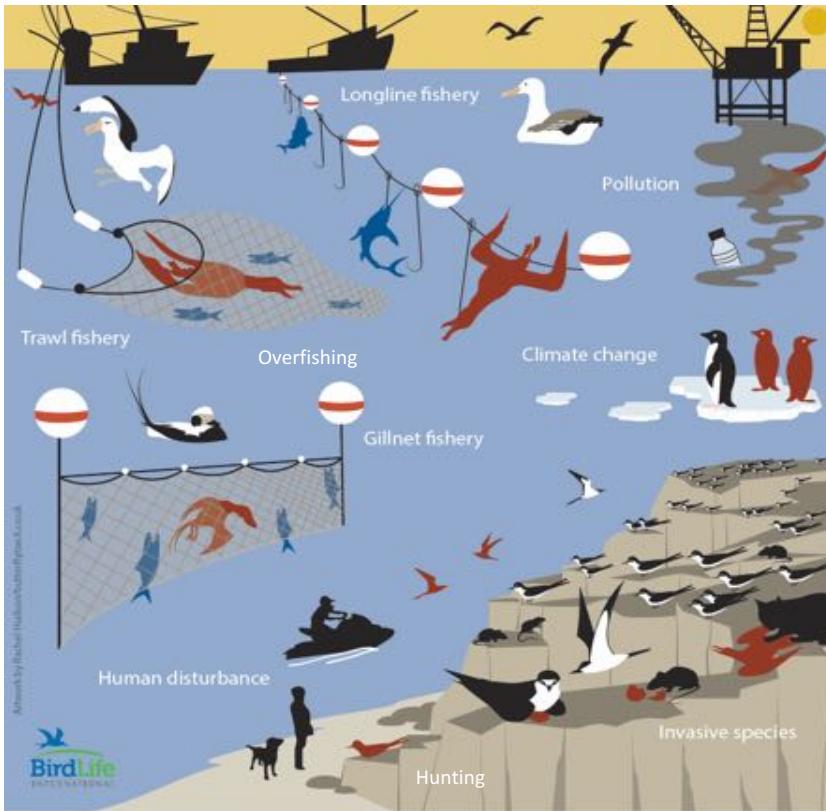


\*Dias et al. 2019: Biol Cons

\*\* Anderson et al. 2011. Endang Species Res

\*\*\* Žydelis et al. 2009. Cons Biol

# Not only bycatch....



Each species: 3 threats on average  
50% of species: 1 marine threat

# Growth in tracking data



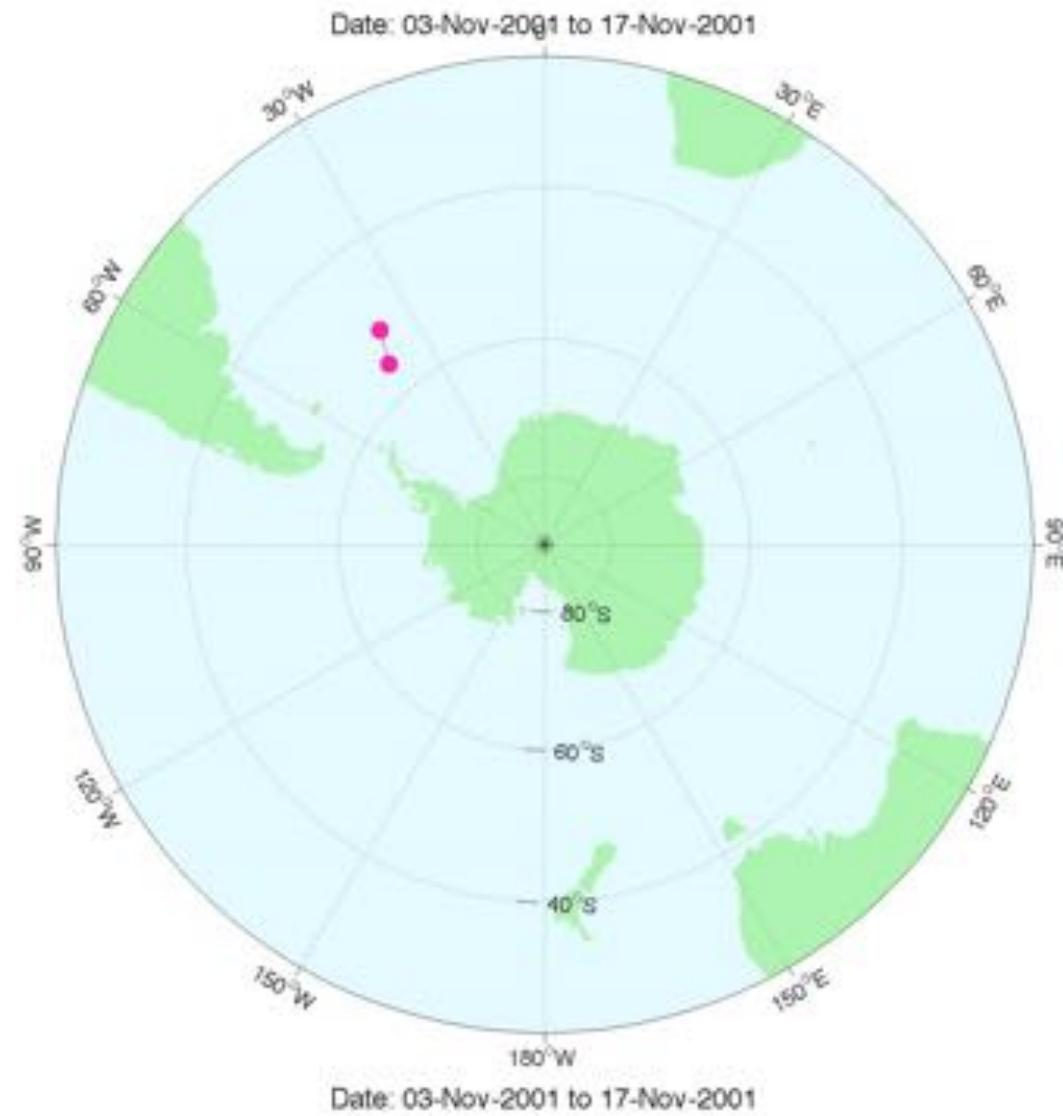
Jon Ashburner



# What can tracking data tell us?



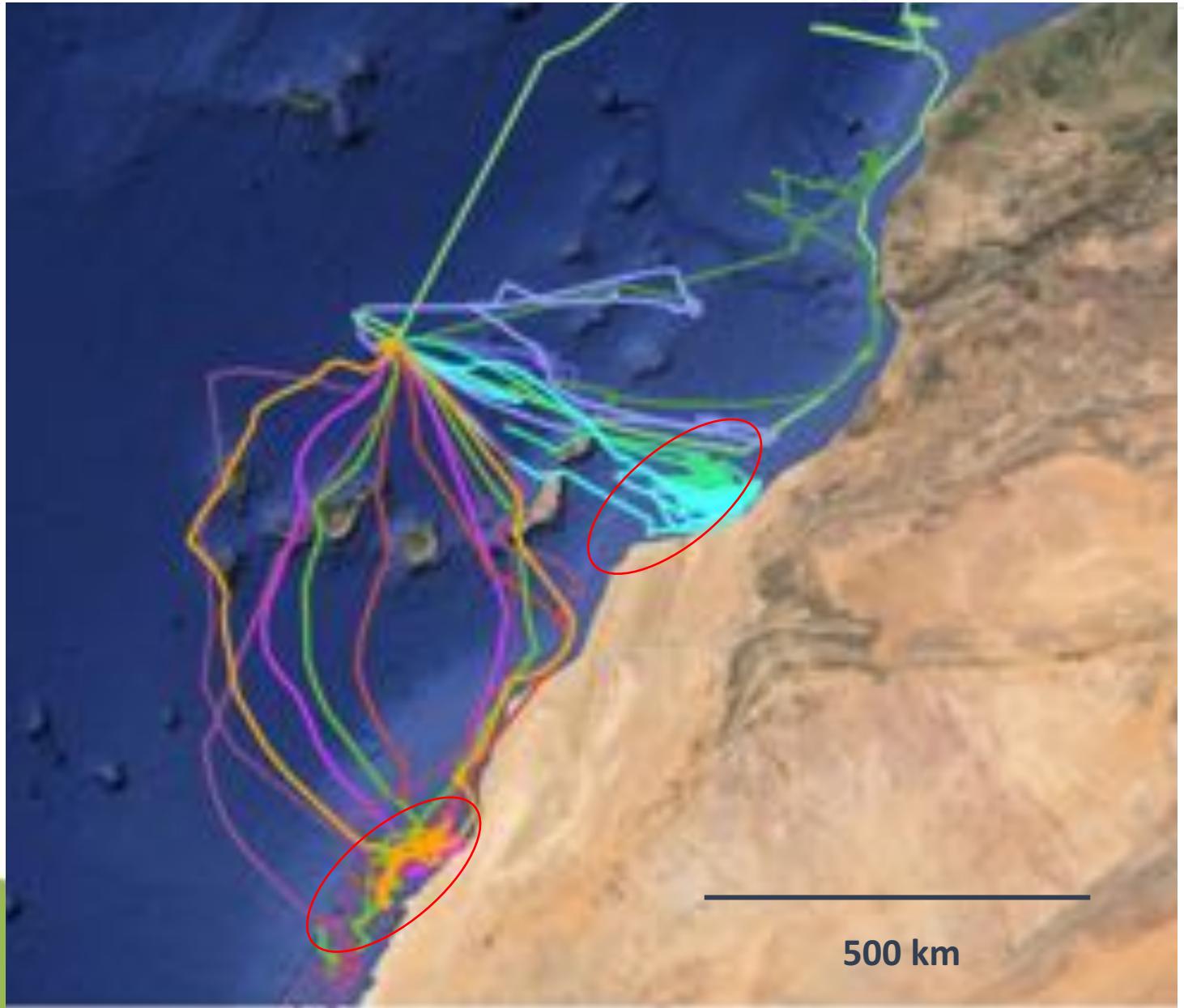
Juvenile wandering albatross (Bird Island, South Georgia) after fledging



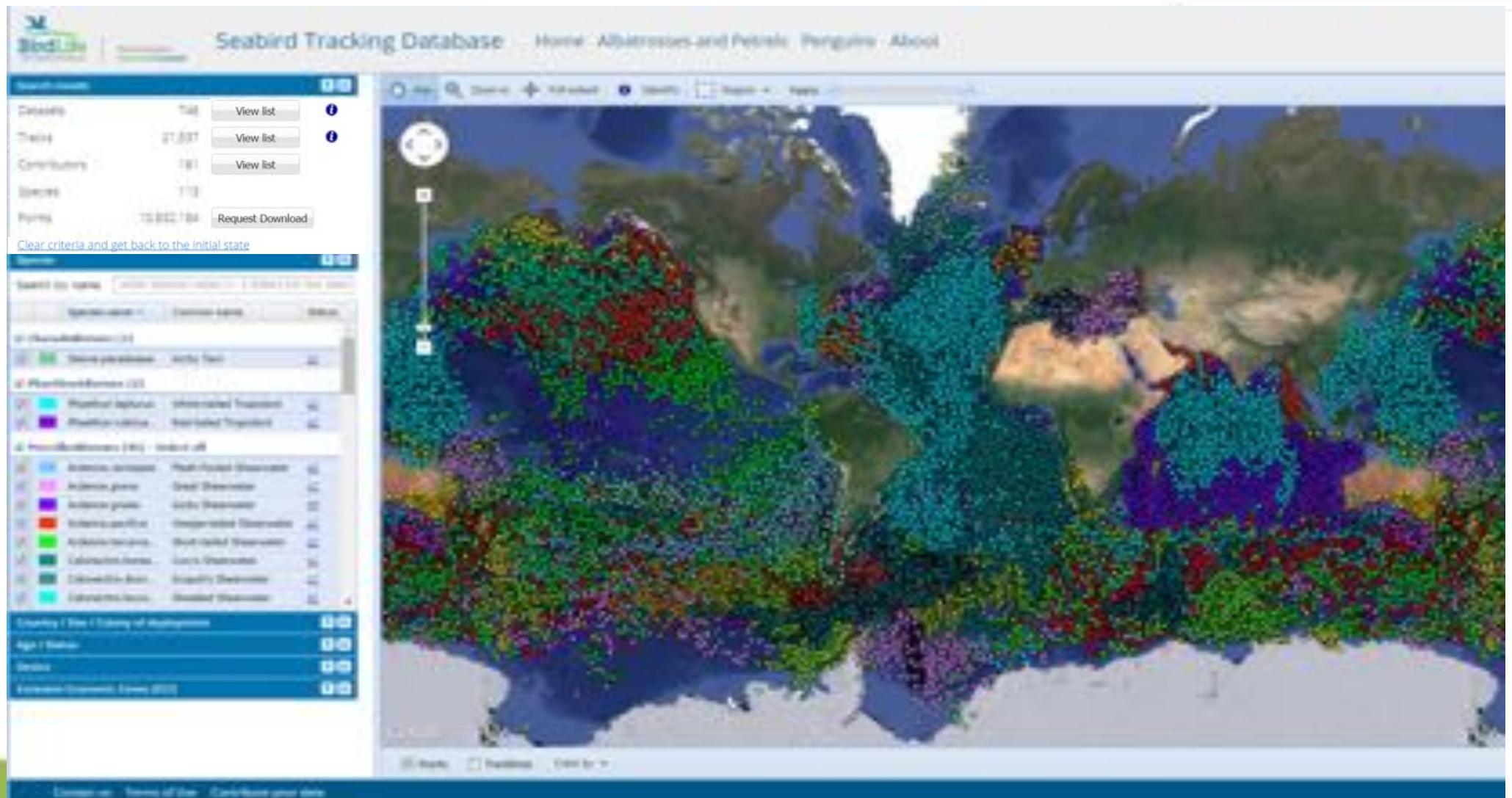
# What can tracking data tell us?



Adult Cory's shearwater (Selvagem Grande, Madeira) during incubation



# The Seabird Tracking Database



# The Seabird Tracking Database

Species: 131

1989 - number of colonies tracked: 1

Tracks: 28,887

Points: >15 million

Colonies: > 360



# The Seabird Tracking Database

Species: 131

Tracks: 28,887

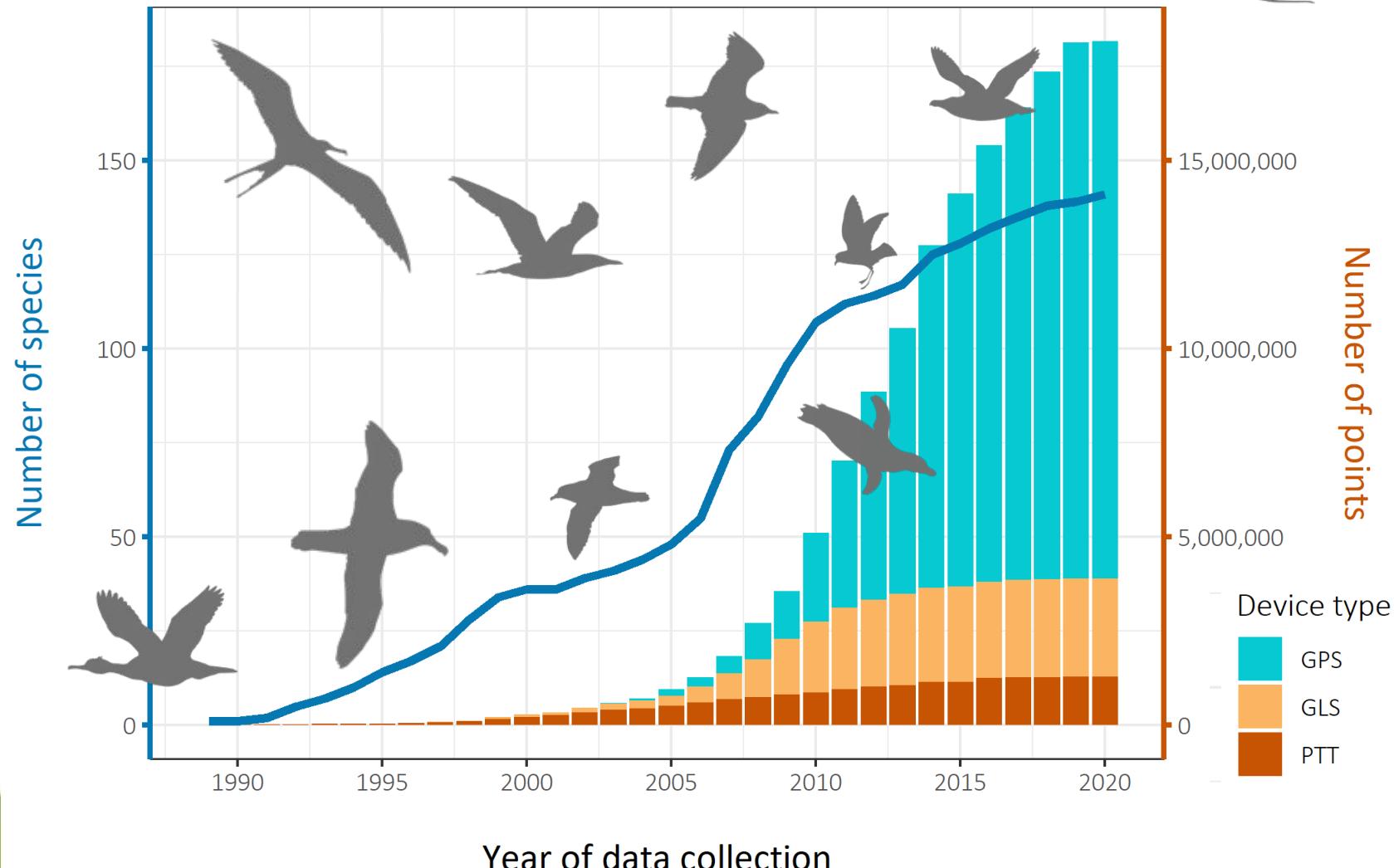
Points: >15 million

Colonies: > 360

Contributors: 220

Trends in number of species and points over time

BirdLife Seabird Tracking Database - including unpublished data



# Conservation outputs



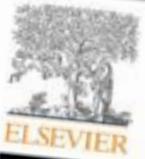
# Using seabird tracking data

Diversity and Distributions, (Diversity Distrib.) (2016) 22, 422–431

BIODIVERSITY  
RESEARCH

## Applying global criteria to tracking data to define important areas for marine conservation

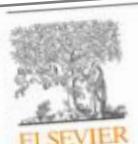
B. G. Lascelles<sup>1\*</sup>, P. R. Taylor<sup>2</sup>, M. G. R. Miller<sup>3</sup>, M. P. Dias<sup>1</sup>, S. Oppel<sup>2</sup>, L. Torres<sup>4</sup>, A. Hedd<sup>5</sup>, M. Le Corre<sup>6</sup>, R. A. Phillips<sup>7</sup>, S. A. Shaffer<sup>8</sup>, H. Weimerskirch<sup>9</sup> and C. Small<sup>2</sup>



Contents lists available at ScienceDirect  
**Biological Conservation**  
journal homepage: [www.elsevier.com/locate/biocon](http://www.elsevier.com/locate/biocon)

Using globally threatened pelagic birds to identify priority sites for marine conservation in the South Atlantic Ocean

Maria P. Dias<sup>a,\*</sup>, Steffen Oppel<sup>b</sup>, Alexander L. Bond<sup>c</sup>, Ana P.B. Carneiro<sup>a</sup>, Richard J. Cuthbert<sup>c</sup>, Jacob González-Solís<sup>d</sup>, Ross M. Wanless<sup>e,f</sup>, Trevor Glass<sup>f</sup>, Ben Lascelles<sup>a</sup>, Cleo Small<sup>b</sup>, Richard A. Phillips<sup>g</sup>, Peter G. Ryan<sup>h</sup>



Contents lists available at ScienceDirect  
**Biological Conservation**  
journal homepage: [www.elsevier.com/locate/biocon](http://www.elsevier.com/locate/biocon)

Important areas and conservation sites for a community of globally threatened marine predators of the Southern Indian Ocean

K. Heerah<sup>a,\*</sup>, M.P. Dias<sup>b,c</sup>, K. Delord<sup>a</sup>, S. Oppel<sup>d</sup>, C. Barbraud<sup>a</sup>, H. Weimerskirch<sup>a</sup>, C.A. Bost<sup>a</sup>



Partnership for  
nature and people

ORIGINAL RESEARCH

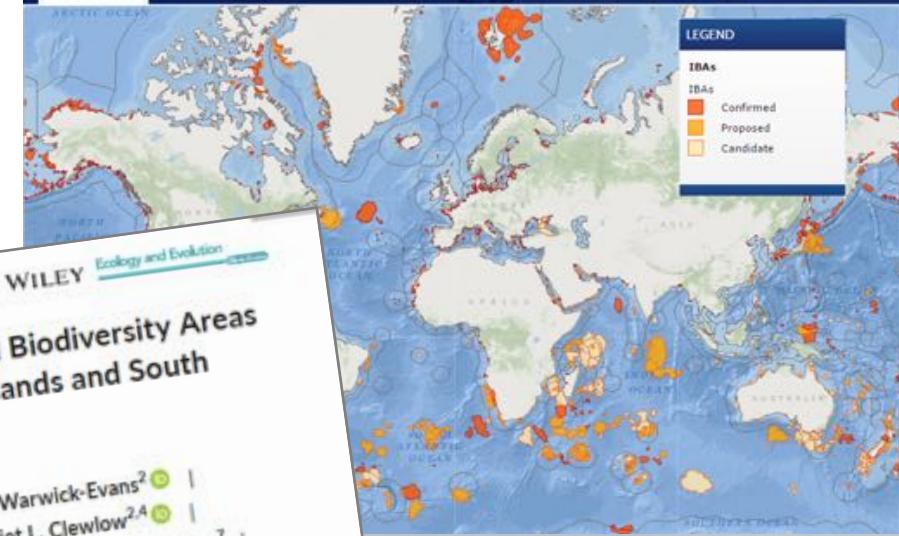
## Identification of marine Important Bird and Biodiversity Areas for penguins around the South Shetland Islands and South Orkney Islands

Maria P. Dias<sup>1</sup> | Ana Paula Bertoldi Carnelio<sup>1</sup> | Victoria Warwick-Evans<sup>2</sup> |  
Colin Harris<sup>3</sup> | Katharina Lorenz<sup>3</sup> | Ben Lascelles<sup>1</sup> | Harriet L. Clelow<sup>2,4</sup> |  
Michael J. Dunn<sup>2</sup> | Jefferson T. Hinke<sup>5</sup> | Jeong-Hoon Kim<sup>6</sup> | Nobuo Kokubun<sup>7</sup> |  
Fabrizio Manco<sup>8</sup> | Norman Ratcliffe<sup>2</sup> | Mercedes Santos<sup>9</sup> | Akinori Takahashi<sup>7</sup> |  
Wayne Trivelpiece<sup>5</sup> | Philip N. Trathan<sup>2</sup>



Marine IBA e-atlas

Delivering site networks for seabird conservation



WILEY Ecology and Evolution

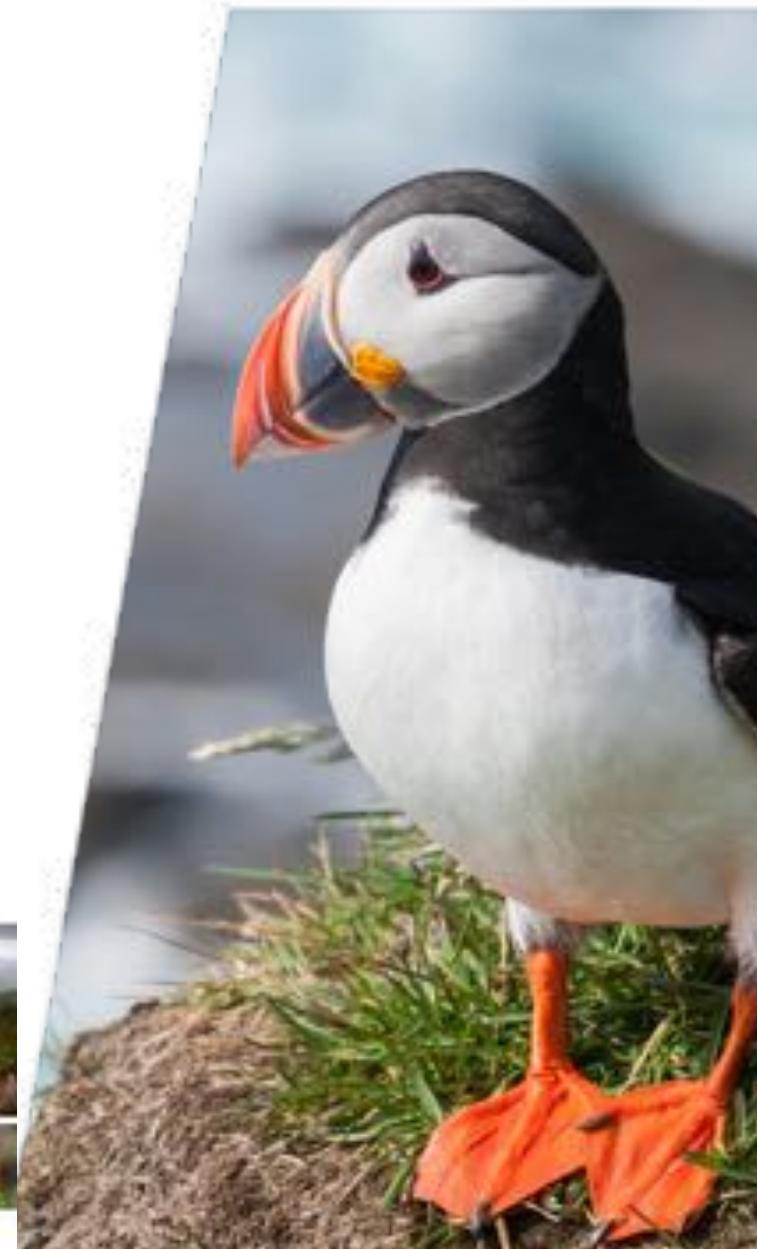


# Important Bird & Biodiversity Areas (IBAs)

- IBAs = globally important sites for the conservation of bird populations, based on internationally agreed set of criteria
- Since 1970s
- >13,000 IBAs identified worldwide
  - largest global network of sites of significance for biodiversity

Donald *et al.* 2019

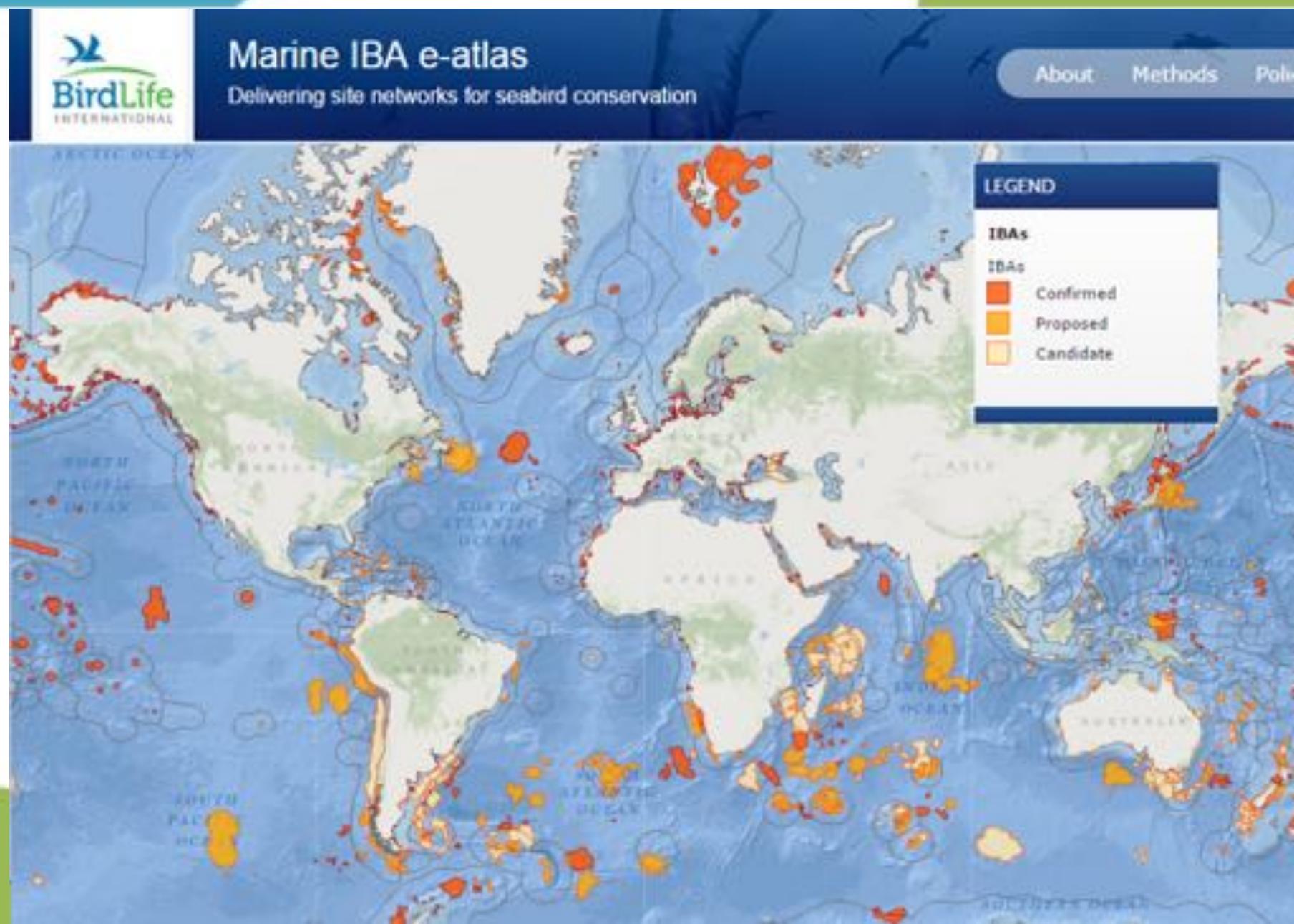
- Important Plant Areas; Important Marine Mammal Areas
- Harmonised approach across all taxa: **Key Biodiversity Areas KBAs**; [www.keybiodiversityareas.org](http://www.keybiodiversityareas.org)



# Marine IBAs

- ~5,000 seabird and marine IBAs identified

<https://maps.birdlife.org/marinelIBAs>



# Different types of marine IBAs



# EBSAs



Convention on  
Biological Diversity

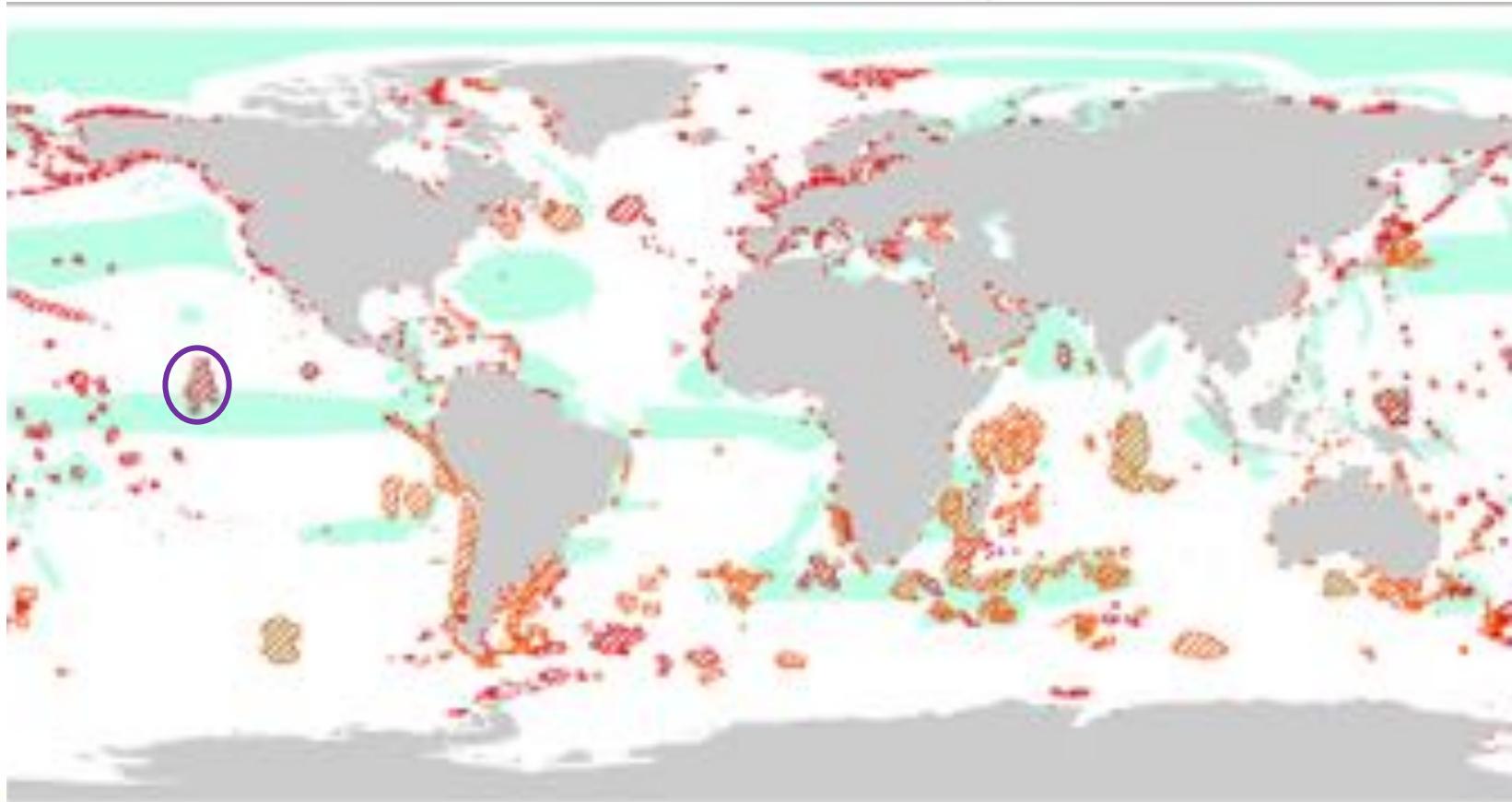
- > 600 marine IBAs included within EBSAs

[www.cbd.int/ebsa](http://www.cbd.int/ebsa)

- Clipperton Fracture Zone Petrel Foraging Area
  - Pycroft's petrel (VU)



Ecologically or Biologically Significant Marine Areas  
*Special places in the world's oceans*



EBSA  
IBA

# Marine IBAs

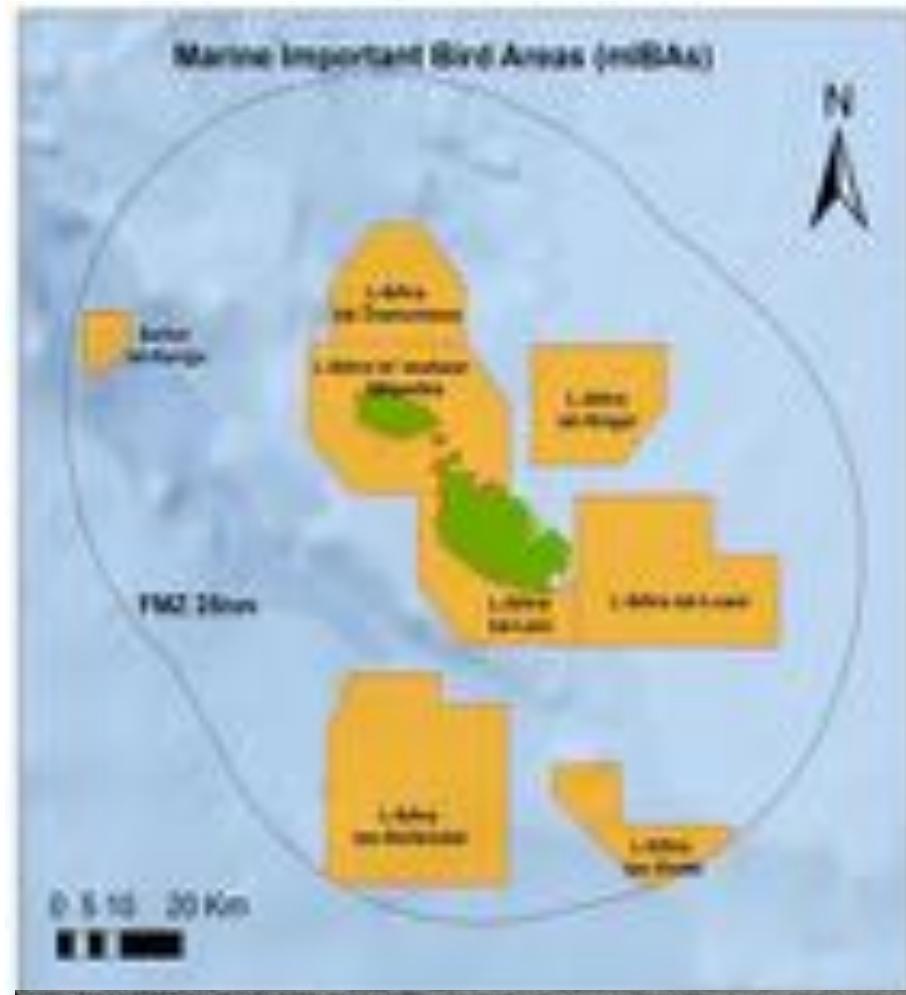
- Designated as Special Protected Areas (SPA) under EU Birds Directive



WE DID IT! MALTA'S FIRST MARINE SPAs  
ANNOUNCED

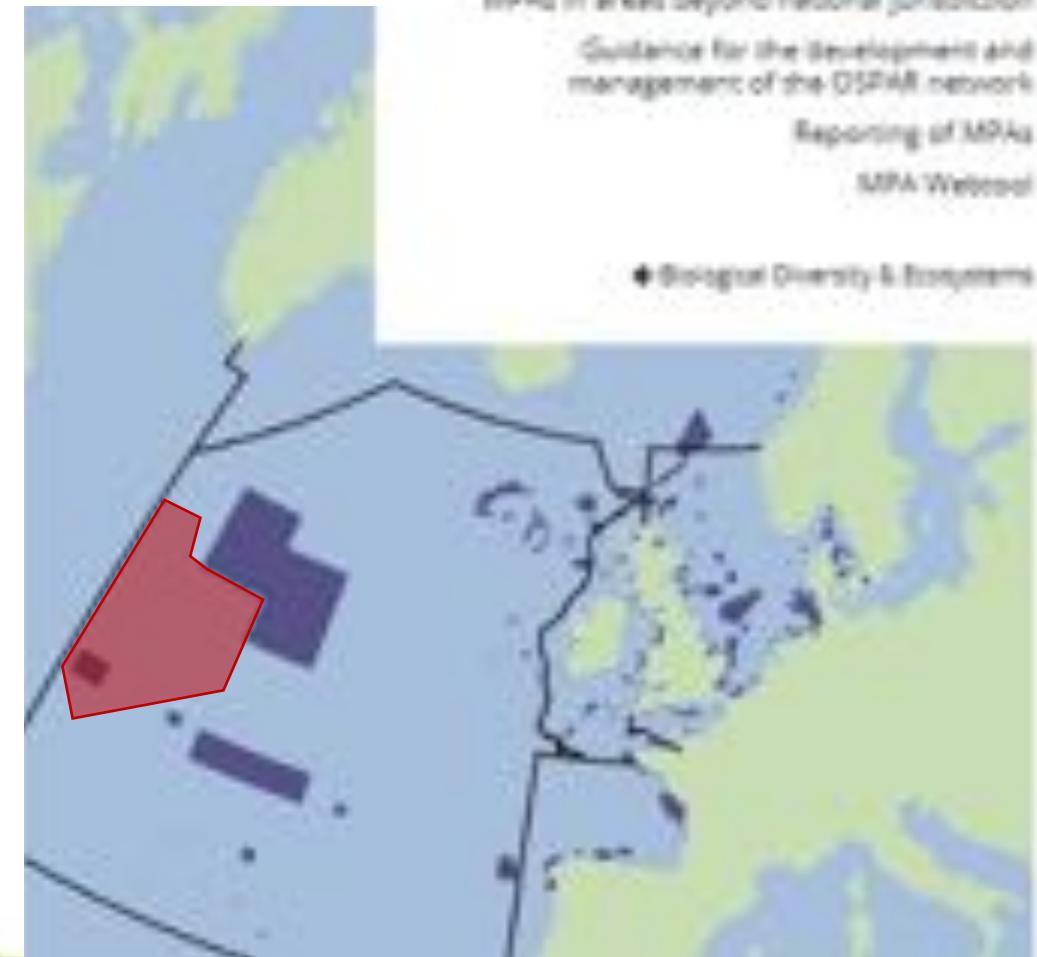
July 1, 2016 · by bernardus · in Blog

Malta now has its first eight marine Special Protection Areas (SPAs), giving our seabirds protection also out at sea. This is a great achievement for the LIFE+ Malta Seabird Project and very good news for the birds.



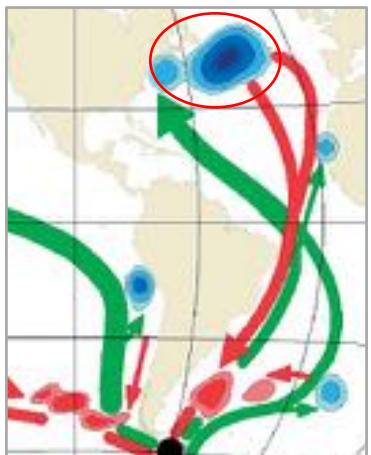
# NACES MPA

- **North Atlantic Current and Evlanov Seamount (NACES) MPA**
  - High seas MPA (OSPAR)
  - Identified from seabird tracking data

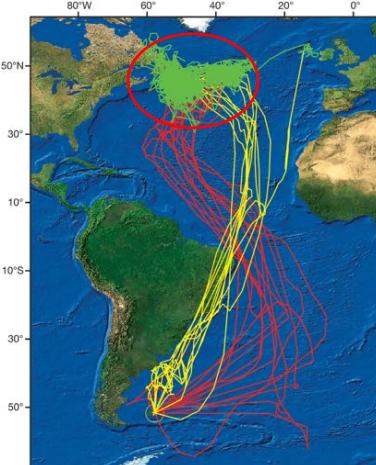


# But it's in the middle of nowhere

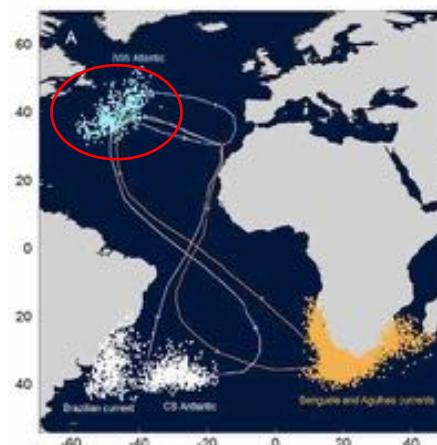
Indications of an important site around the Mid Atlantic Ridge from single species tracking studies



**South Polar Skua**  
Kopp *et al.* 2011



**Sooty Shearwater**  
Hedd *et al.* 2012



**Cory's Shearwater**  
Dias *et al.* 2012



**Northern Fulmars**  
Edwards *et al.* 2013



# NACES MPA

- **21** species
- Up to **5 million** birds
- **16** jurisdictions
- Year round
- **66** contributors



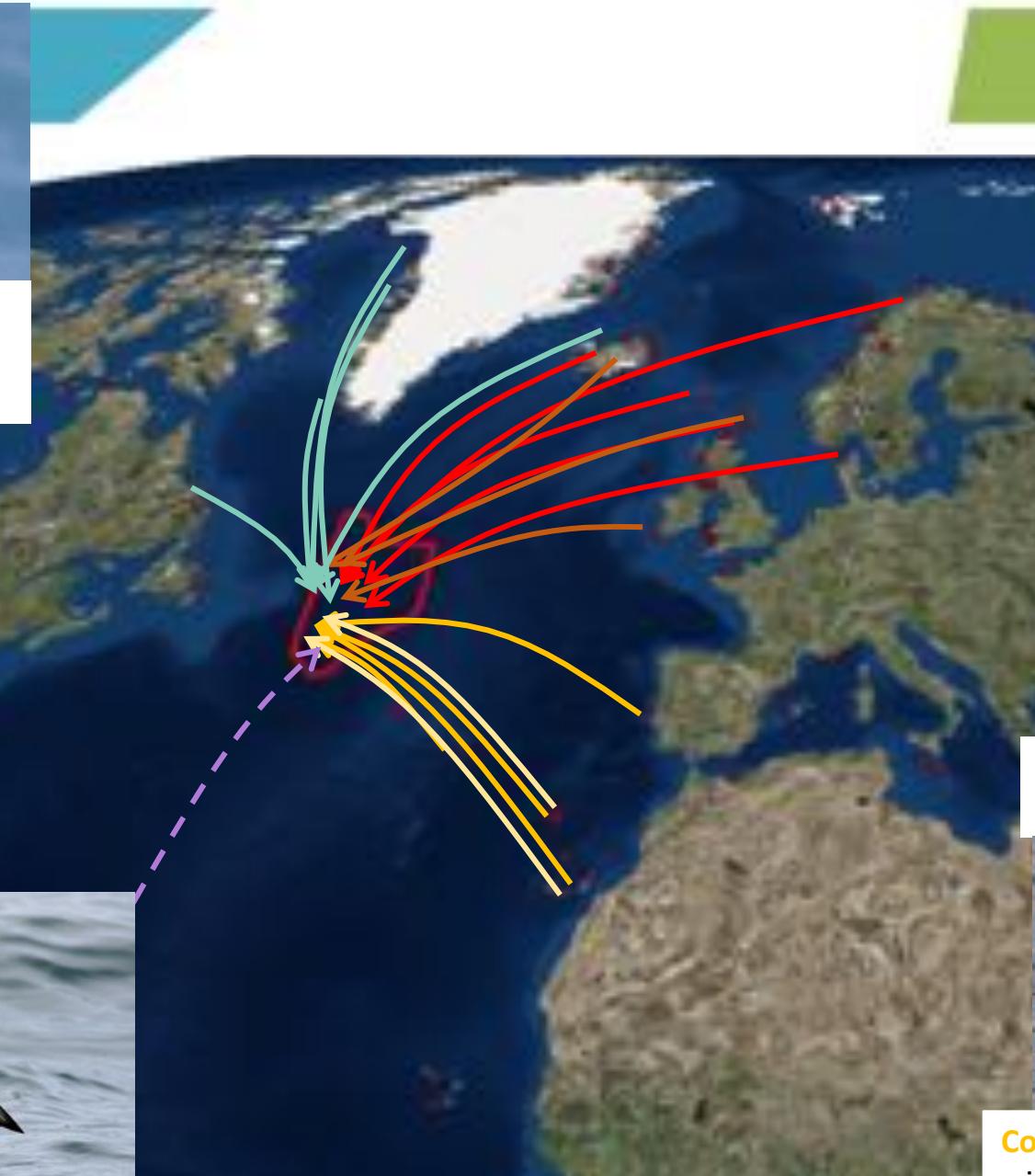
**Little Auk**  
2.3M in winter  
(Greenland)



**Long-tailed Jaeger:**  
46k in migration  
(stopover) (Denmark  
[Greenland], Norway,  
Sweden)



**Great Shearwater:**  
1.8M (Tristan da Cunha)



**Black-legged Kittiwake:**  
1.3M in winter (Norway,  
Iceland, UK, Faroe,  
Denmark)



**Atlantic Puffin:** 1M in  
winter (Iceland, UK, Ireland)



**Cory's shearwater:** 60k in  
winter

**Bulwer's petrel:** 1.3k winter +  
breeding (Portugal, Spain)

- **If this site is designated:**
  - First high seas MPA identified from seabird tracking data
  - Protect important migratory connectivity
  - Non-breeding distributions
  - Address an important gap for seabirds



# Plastics and petrels

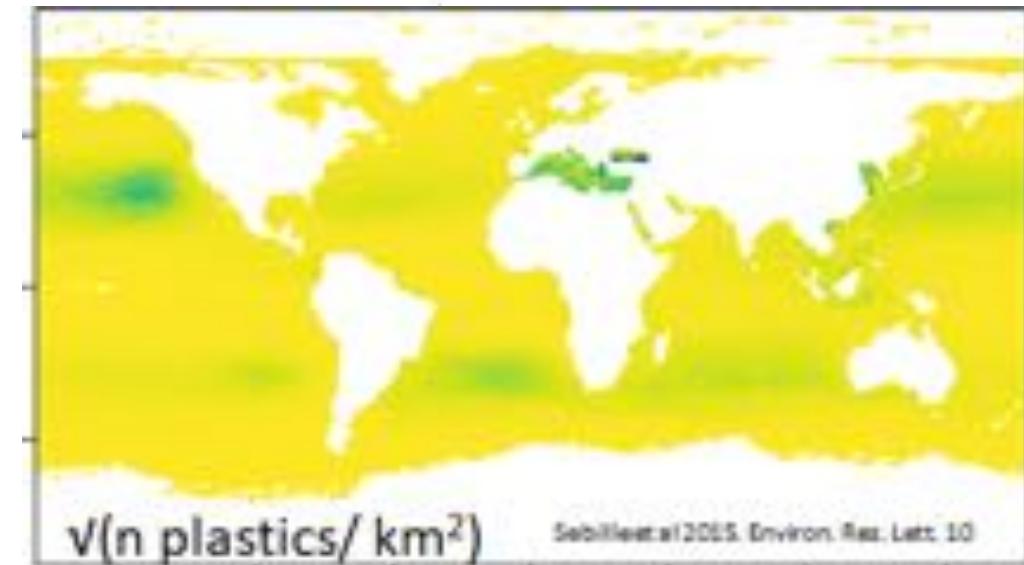
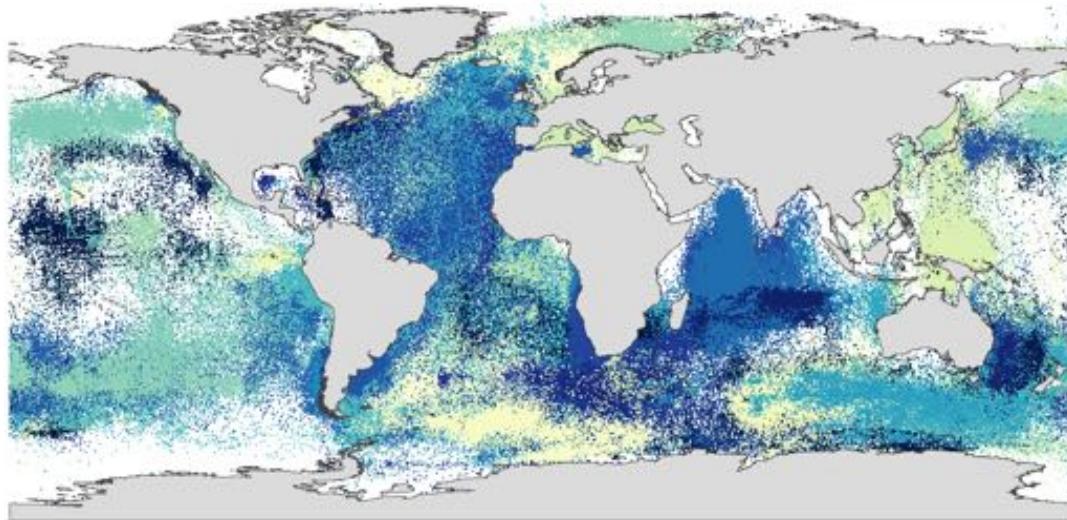
- Risk of encountering marine plastic
- 76 species; 148 populations

Cambridge Conservation Initiative

About Our

**Plastic connectivity:  
disentangling the problem  
of plastic pollution for  
pelagic seabirds**

<https://www.cambridgeconservation.org/project/plastic-connectivity-disentangling-the-problem-of-plastic-pollution-for-pelagic-seabirds/>



# Climate change

ECOGRAPHY

A JOURNAL OF SPACE  
AND TIME IN ECOLOGY

Research | Open Access | CC BY

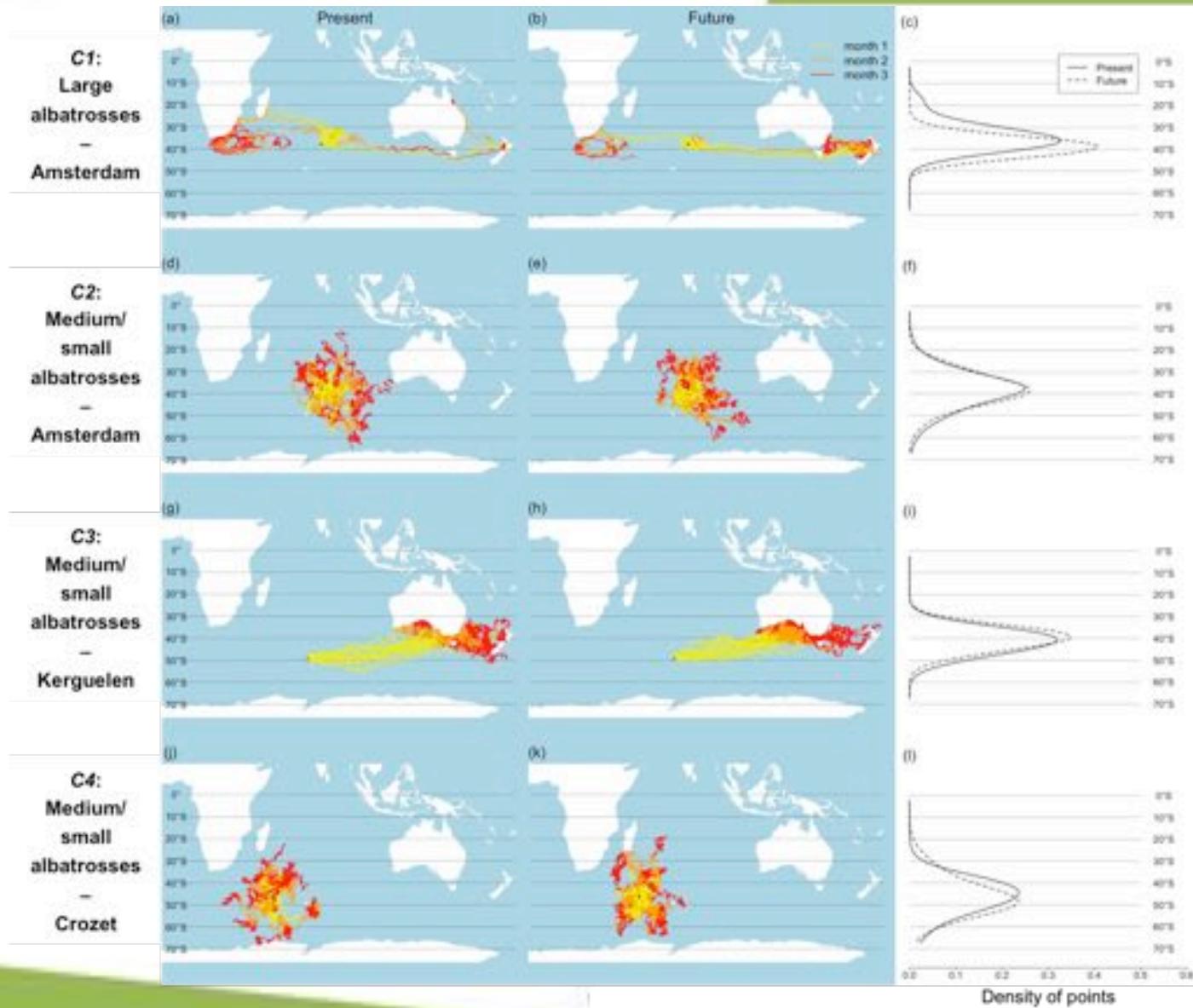
Projected migrations of southern Indian Ocean albatrosses as a response to climate change

Marius Somveille, Maria P. Dias, Henri Weimerskirch, Tammy E. Davies

First published: 21 July 2020 | <https://doi.org/10.1111/ecog.05066>



- Non-breeding distribution
- Categorized by size and colony
- Model matched to tracking data
- Coarse-scale distribution



# Climate change

ECOGRAPHY

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AND TIME IN ECOLOGY

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Projected migrations of southern Indian Ocean albatrosses as a response to climate change

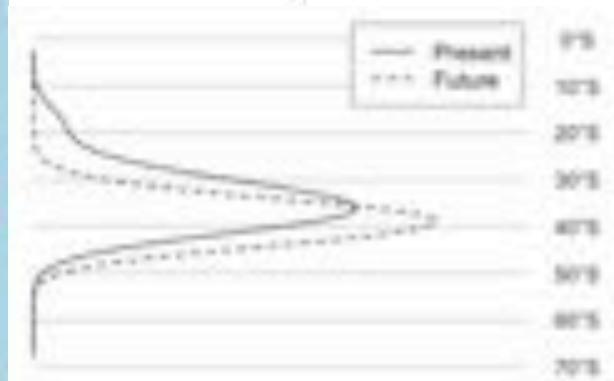
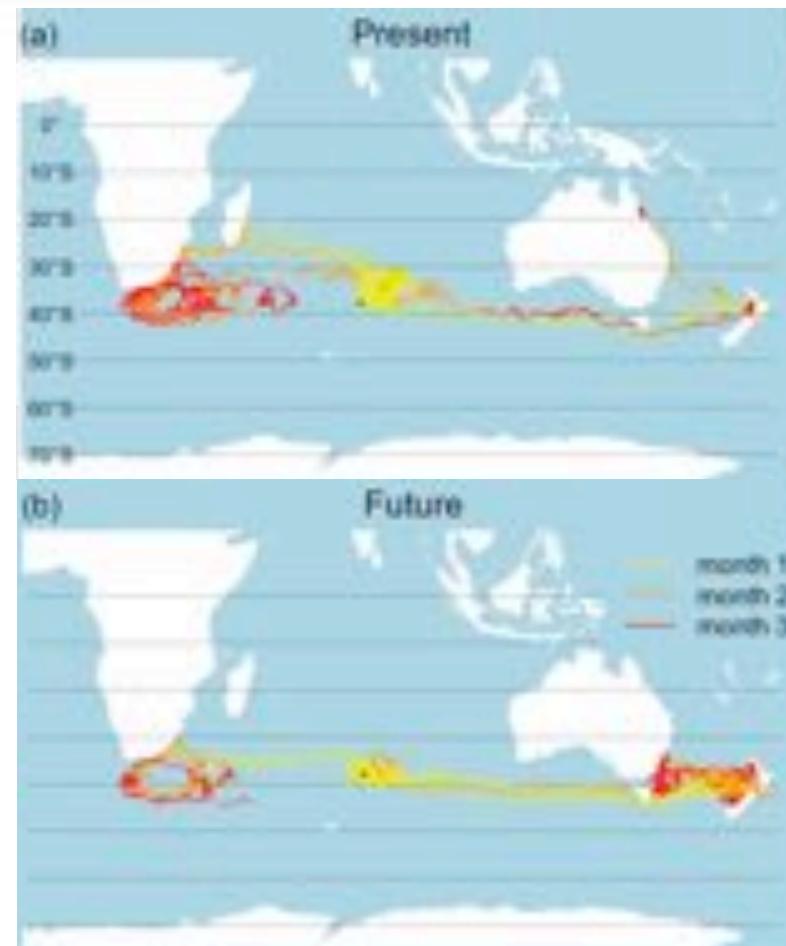
Marius Somveille, Maria P. Dias, Henri Weimerskirch, Tammy E. Davies

First published: 21 July 2020 | <https://doi.org/10.1111/ecog.05066>



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## Large albatrosses, Amsterdam



© Dimas Gianuca

BirdLife  
INTERNATIONAL

Partnership for  
nature and people

# Large scale distribution

Journal of Applied Ecology



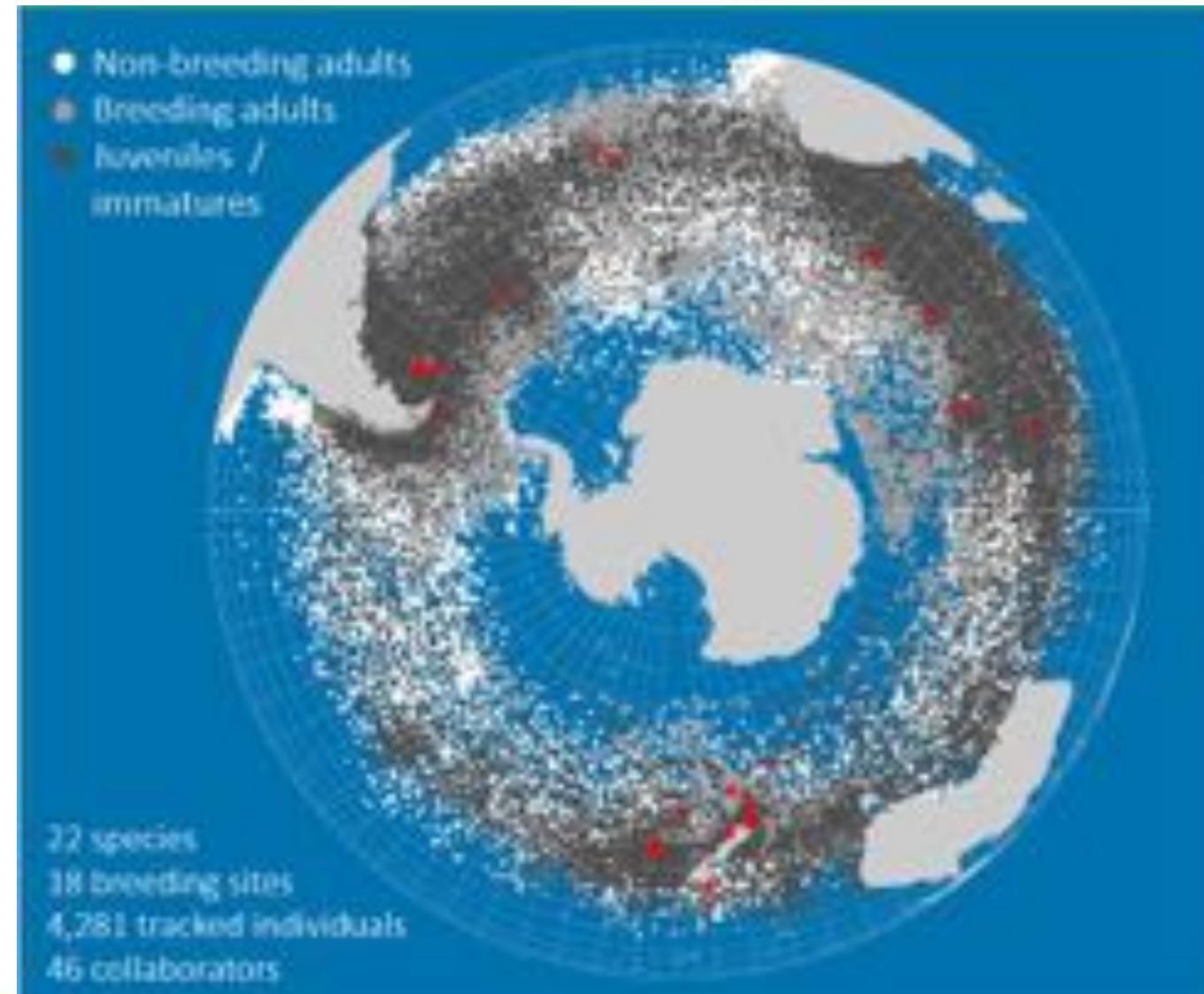
RESEARCH ARTICLE

A framework for mapping the distribution of seabirds by integrating tracking, demography and phenology

Ana P. B. Carneiro, Elizabeth J. Pearmain, Steffen Oppel, Thomas A. Clay, Richard A. Phillips, Anne-Sophie Bonnet-Lebrun, Ross M. Wanless, Edward Abraham, Yvan Richard, Joel Rice ... See all authors

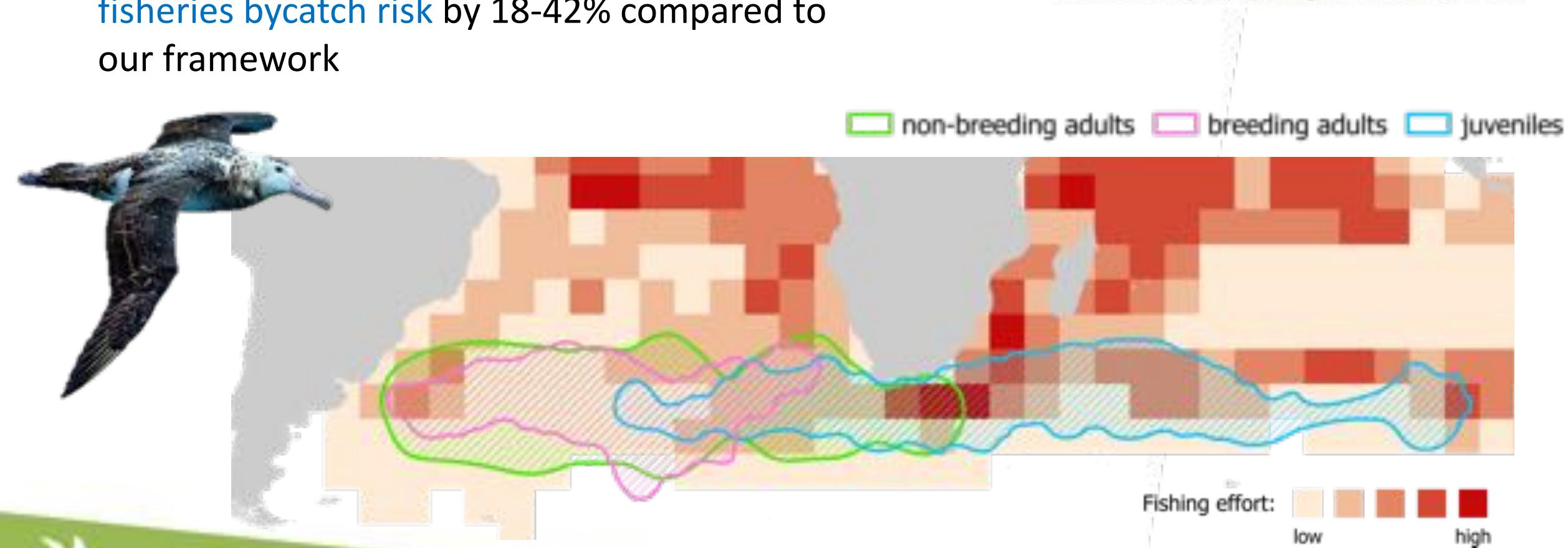
First published: 04 February 2020 | <https://doi.org/10.1111/1365-2664.13568> | Citations: 3

- Combined **tracking**, **demographic**, and **phenological** data from all major life-history stages to estimate robust density distributions of seabird populations



# Large scale distribution

- Adult-only distribution maps underestimated fisheries bycatch risk by 18-42% compared to our framework



# Bycatch mitigation

- Work with governments and RFMOs to reduce bycatch
- Albatross Task Force
  - Bird scaring lines
  - Night setting
  - Line weighting



@AlbatrossStories

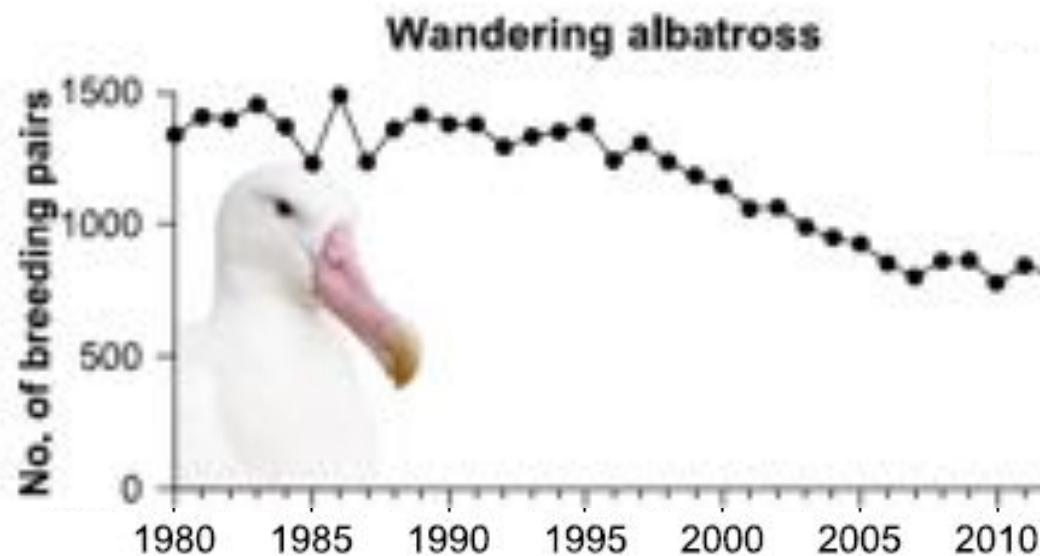


@AlbyTaskForce



Photo: Nahuel Chavez  
#AlbatrossTaskForce

# Seabird recovery?



**Spectacled Petrel**

I'm an ocean wanderer...  
I don't know about national boundaries and I spend over half of my time in waters outside national jurisdictions.

Location	Percentage
Time in High Seas	60%
Time in National Jurisdictions	40%

Data owner: Peter G. Ryan of the FitzPatrick Institute of African Ornithology  
Analysis by: Martin Beal, ISPA and BirdLife

# Conservation optimism



**MiCO Migratory Connectivity in the Ocean**

What is MiCO? | Launch MiCO System | Events & Publications | Contribute Data | Twitter | More

CASE STUDY

## Management implications of migratory behavior: Cory's shearwater

Breeding Season (-April to October)  
During the breeding season, Cory's shearwaters move through the waters of many European and African countries to forage and find food for their chicks.



**Seabird Sentinels will help mitigate bycatch**

What can albatrosses tell us about their interaction with fishing vessels?  
With this new technology, we'll find out.

**8 out of 10** hotspot fisheries for seabird bycatch introduced new regulations to protect seabirds in the last decade



**albatross Task Force**



# Many thanks!

Ana Carneiro  
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Esteban Frere  
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Oli Yates  
Marguerite Tarzia  
Richard Phillips  
Steffen Oppel  
Paulo Catry  
José Pedro Granadeiro  
Ewan Wakefield  
Morten Frederiksen  
Børge Moe  
John Croxall



**Seabird Tracking Database**  
Tracking Ocean Wanderers

We are the Power of Many!

Dave Watts, Stephen Votier, Jerome Fort, Benjamin Metzger, Ivan Ramirez, Deon Nel, Robert W Furness, Ben Lascelles, Carsten Egevang, Flavio Quintana, Bergur Olsen, Jacopo G. Cecere, Gregory R Balogh, Signe Christensen-Dalsgaard, Iain Stenhouse, Richard Phillips/BAS, Flemming Merkel, Klemens Puetz, Olivier Gilg, Adrian Schiavini, Johannes Lang, Morten Frederiksen, Michelle Kappes, Jean-Claude Stahl, Jaime Albino Ramos, Peter Ryan, Rob Suryan, H. Grant Gilchrist, Yann Kolbeinsson, Janos Hennicke, Jose Manuel Arcos, David Hyrenbach, Chris Powell, Teresa Catry, Lorna Deppe, Johannes Krietsch, Robin Freeman, Jez Blackburn, Juan F. Masello, Claire Lacey, Christina Hagen, Christopher Robertson, Maria Bogdanova, Rowena Langston, Elizabeth Bell, Joel Bried, Melinda Conners, Javier Arata, Francis Daunt, David Nicholls, Peter Hans-Ulrich, Jose Pedro Granadeiro, Nuno Quieroz, Sarah Wanless, Tycho Anker-Nilssen, Clay Gravelle, Richard Cuthbert, Mercedes Santos, Andrew Westgate, Jeroen Creuwels, Thomas A. Clay, Rosemary Gales, Ewan Wakefield, Hólmfríður Arnardóttir, Kath Walker, Lorraine Chivers, Peter Ryan, Azwianewi Makhado, Roland Gauvain, Antony Gaston, Robert Ronconi, Nobuo Kokubun, Greg Robertson, Jan Esefeld, Akira Suzuki, Mark Jessopp, Matthieu Le Corre, Leigh Torres/NIWA, Justine Dossa, April Hedd, Rachel Davies, Jonathan Green, Maria Magalhaes, Mark Andrew Hindell, Petra Quillfeldt, Ib K Petersen, Anders Mosbech, Veronica Neves, Guilherme Bortolotto De Oliviera, Bruna Campos, David Gremillet, Henri Weimerskirch, Matt J Rayner, Mark Belchier/BAS, Euan Dunn, Laura McFarlane Tranquilla, Todd Landers, Keith Hamer, David Simms, Dave Anderson, Nadya Ramirez-Martinez, Rachael Alderman, Ingvar Sigurosson, Jacob Gonzalez-Solis, Paul Thompson, Louise Soanes, Samantha Petersen, Sarah Crofts, Jeremy Lee Madeiros, Børge Moe, Nuno Simão, Akinori Takahashi, William Montevercchi, Amanda Freeman, Aevar E Petersen, Megan Tierney, Susana Cardenas Alayza, Thomas Bodey, Hallvard Strøm, David Thompson, Jill Awkerman, Paul Sagar, Jan Veen, Jefferson Hinke, Leandro Bugoni, Penny Holliday, Susan Waugh, Graham Robertson, Iain Staniland, Mike James, Matthias Kopp, Vitor Paiva, Peter H Becker, Manuel Bischoff, Scott Eckert, Erpur Snær Hansen, Paulo Catry, Phil Trathan/BAS, Rui Prieto, Robert van Bemmelen, Yuri Krasnov, Francis Zino, Mike Dunn/BAS, Ellen Magnusdotti, Alex Bond/RSPB, Arnþor Gardarsson, Wayne Trivelpiece, Robert Crawford, Andrea Raya Rey, Aevar Petersen, Norman Ratcliffe/BAS, Carlo Catoni, Scott Shaffer, Þorkell Lindberg Þórarinsson, Marguerite Tarzia, Oliver Padget, Annette Fayet, Asuncion Ruiz, Thierry Boulinier, Niels Martin Schmidt, Stuart Bearhop, Jóhannis Danielsen, Yuna Kim, Phil Atkinson, Ross Wanless, P. Dee Boersma, Rosana Paredes, Jannie Fries Linnebjerg, Mark Mallory, Michael P. Harris, Deryk Shaw, Ian Cleasby, Daniel Oro, Michelle Hester, Paloma Carvalho, Mandy Shaifer, Katrin Ludynia, Paul Scofield, Andre Raine, Annette Scheffer/BAS, Charles-Andre Bost, Willem Bouten, Vegard Brathen, Tim Guilford, Bindi Thomas, Takashi Yamamoto, Bill Henry, Giorgia Gaibani



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