Seabirds and Marine Plastic Debris in the Northeastern Atlantic

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Marine Plastic Pollution

- An estimated 4.8 to 12.7 million metric tons of plastic enters the oceans annually.
- Over 690 marine species have been affected by marine debris, the majority involving plastic (Gall & Thompson 2015).
- Seabirds are affected through ingestion or entanglement (including at the nest).
Aims of our research

- To determine what we currently know about seabirds and marine plastic in the northeastern Atlantic Ocean, focusing on nest incorporation and ingestion.
- Identify knowledge gaps and make recommendations for future monitoring to improve our understanding of how marine plastic affects seabirds.
Methods: Synthesis of the literature

- Extensive review of the peer-reviewed and grey literature up to 28th February 2017
- Key words searches: plastic, diet, plastic ingestion, nest, nest incorporation, nest material and marine debris
- For each study, we recorded the species, location, year of sampling, sampling method, and the frequency of occurrence (%) of plastic ingestion or nest incorporation
- Where provided, we also recorded all metrics referring to the number, mass, size, type, and colour of plastic identified
- For plastic ingestion, we determined how many studies achieved the standardised metric recommendations outlined by Provencher et al. (2017)
Methods: Species and area of interest

- 69 seabird species –
  - Tubenoses
  - Cormorants
  - Gannets
  - Phalaropes
  - Skuas
  - Gulls
  - Terns
  - Auks
  - Loons
  - Seaducks
  - Mergansers

- Non-continental European countries and autonomous territories within northeastern Europe
What we found: Seabirds and plastic ingestion

Plastic ingestion was recorded in 36% of species
(or 74% of those examined!)

No evidence of plastic ingestion in 13% of species

51% of species have not been examined for plastic ingestion

O’Hanlon et al. 2017
Results: Seabirds and plastic ingestion

There was spatial and temporal bias in coverage - 61% of data was collected prior to 2000
Results: Seabirds and nest incorporation

Only 3 studies reported quantitative data on nest incorporation!

- Northern Gannet, Wales (1)
- Black-legged Kittiwake, Denmark (2)

Not because it doesn’t occur but because it is under-recorded
Filling in the gaps!

This summer we (including citizen scientists and seabird ecologists) have been collecting data from other seabird colonies across the UK and further afield, especially of Gannets.
Why?
To find out which seabird species are most affected by plastic, and where
Studies should report metrics as recommended by Provencher et al. (2017) especially mass

The collection of large sample sizes at regular intervals is necessary to detect changes

Recommendations

A standardised, repeatable, protocol is required to obtain quantified data on nest incorporation of plastic

Collaborate effort is required to collect data from multiple locations over time in a standardised way
THE EFFECTS OF MARINE PLASTICS ON SEABIRDS IN IRELAND

Ireland is an important region for seabirds, incorporating 29 significant bird and biodiversity areas in marine habitats, supporting internationally important numbers of 25 species.

The presence of micro-plastic is widespread in the north-eastern Atlantic with a mean of 2.46 particles m⁻³.

Recent monitoring in the Celtic Sea revealed that 57% of trawl samples contained litter, with 84% comprising of plastic.

Between 2012 and 2016, 93% of 14 beached fulmars collected from Ireland were found to contain ingested plastic.

69 seabird species commonly occur as breeding species or migrants in Ireland. Plastic ingestion has been recorded in 13, however 52 have not yet been examined for plastic ingestion.
Thank you for listening!

- Plastic ingestion was recorded in 36% of 69 seabird species
- 51% of species have not been investigated for plastic ingestion
- Only 2 species had published data on nest incorporation
- Low spatial and temporal coverage of data
- Co-ordinated effort in collecting data is required so trends can be monitored over time and space

If you have any questions please email: nina.ohanlon@uhi.ac.uk