



Plastic Particles in Fulmar Stomachs in the North Sea



MSFD Descriptor: 10 - Marine litter
 MSFD Criteria: 10.2 - Impacts of litter on marine life;
 10.1 - Characteristics of litter in the marine and coastal environment

Key Message Currently 58% of beached North Sea fulmars have more than 0.1 g of plastic in their stomachs, exceeding OSPAR's long-term goal of 10%. This reflects the abundance of floating litter in their environment. There has been no significant change in the amount of plastic in fulmar stomachs over the past ten years

Background

Litter is widespread in the marine environment and is harmful to wildlife and the ecosystem. OSPAR aims to substantially reduce the amount marine litter in the OSPAR Maritime Area by 2020 to levels where properties and quantities do not cause harm to the marine environment. The quantity of plastics ingested by marine wildlife mainly reflects the abundance of floating litter in their environment.

OSPAR monitors and assesses plastics in the stomachs of northern fulmars as one of its indicators of environmental quality. Fulmars are abundant and widespread seabirds known to regularly ingest litter, with nearly all individuals having at least some plastic in their stomachs. Although fulmars forage near the water surface, their stomachs may also contain items from deeper water or items that may be indirectly ingested through their prey.

The fulmar Indicator Assessment approach is based on a previous OSPAR Ecological Quality Objective (EcoQO). The monitoring programme uses corpses of beached birds or individuals accidentally killed. OSPAR has a long-term goal of less than 10% of fulmars exceeding a level of 0.1 g of plastic in their stomachs. Research methods and results have been published in reports and peer-reviewed scientific literature as well as specific OSPAR Guidelines. This indicator is currently used only in the Greater North Sea. However it could be suitable for implementation in Arctic Waters and Celtic Seas and has already been used in fulmar studies outside the OSPAR Maritime Area, in the North Atlantic and North Pacific.

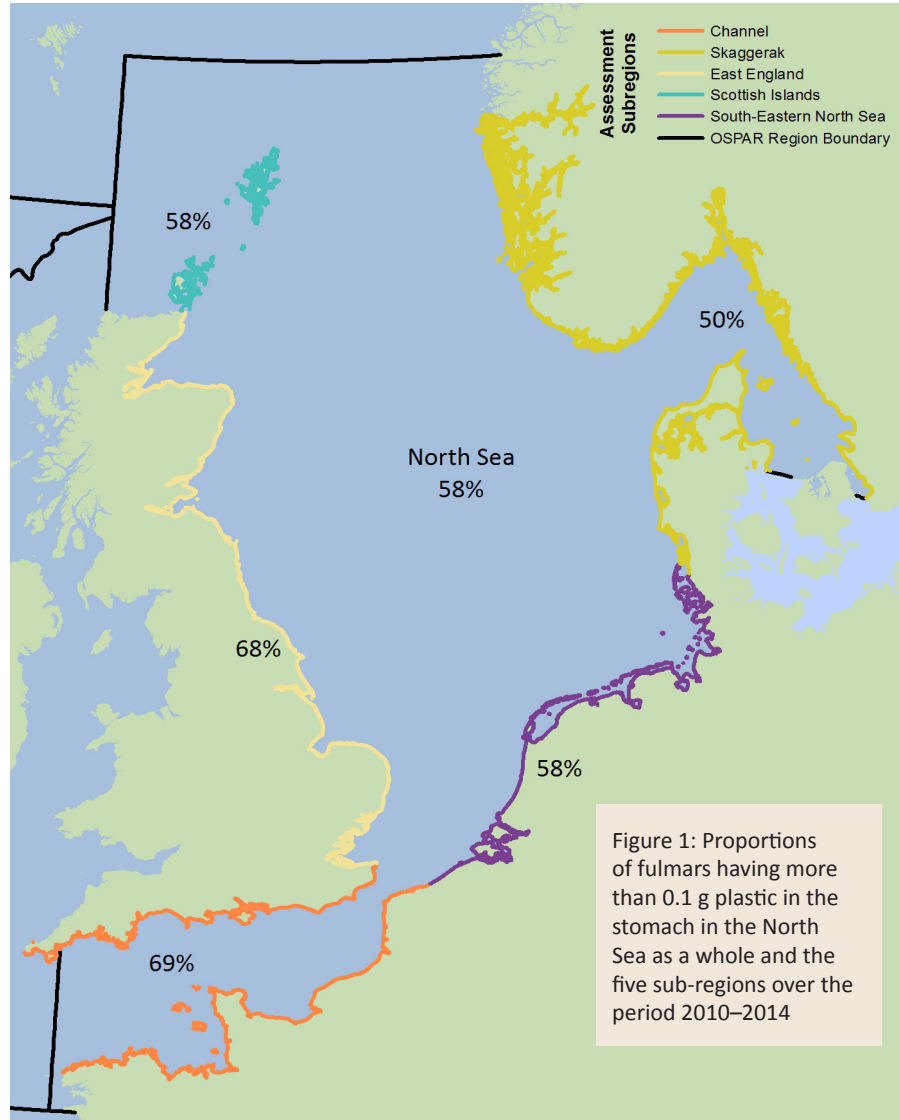


Figure 1: Proportions of fulmars having more than 0.1 g plastic in the stomach in the North Sea as a whole and the five sub-regions over the period 2010–2014

Results

Assessment 2010-2014

Over the five-year period 2010–2014 inclusive, OSPAR's long-term goal in terms of plastic litter ingestion by seabirds was not achieved anywhere in the North Sea. Among all 525 fulmar stomachs analysed over this period, 58% contained more than 0.1 g of plastic, whereas OSPAR's long-term goal is to reduce this to less than 10%. Of all birds analysed, 93% had some ingested plastic, and average values per bird were 33 particles and 0.31 g. Fulmars from the English Channel had the highest plastics load, slightly lower levels being observed further north. Over the last five-year period no significant increases or decreases in ingested plastic mass were observed in the North Sea as a whole or in any of the five sub-regions. **Figure 1** shows the sub-regional differences for the North Sea in relation the percentage of birds that have ingested more than 0.1 g. (This assessment uses the previous boundary between the North Sea and Celtic Seas, however this will be updated in the next assessment) Only in the far North-western Atlantic (the Canadian Arctic) do plastic ingestion levels approach the OSPAR long-term goal.

Trends 2005-2014

Trends are evaluated against the year of collection over the most recent ten-year period, in this assessment 2005–2014, inclusive. The current assessment for the five sub-regions (Figure 1) confirms that sub-regional levels have remained largely stable since the start of the data collection (Figure 2), with fairly constant sub-regional differences and levels clearly elevated relative to those observed in incidental studies further to the north in the OSPAR Maritime Area.

There is high confidence in both the methodology and data availability.

Plastic Particles in Fulmar Stomachs in the North Sea

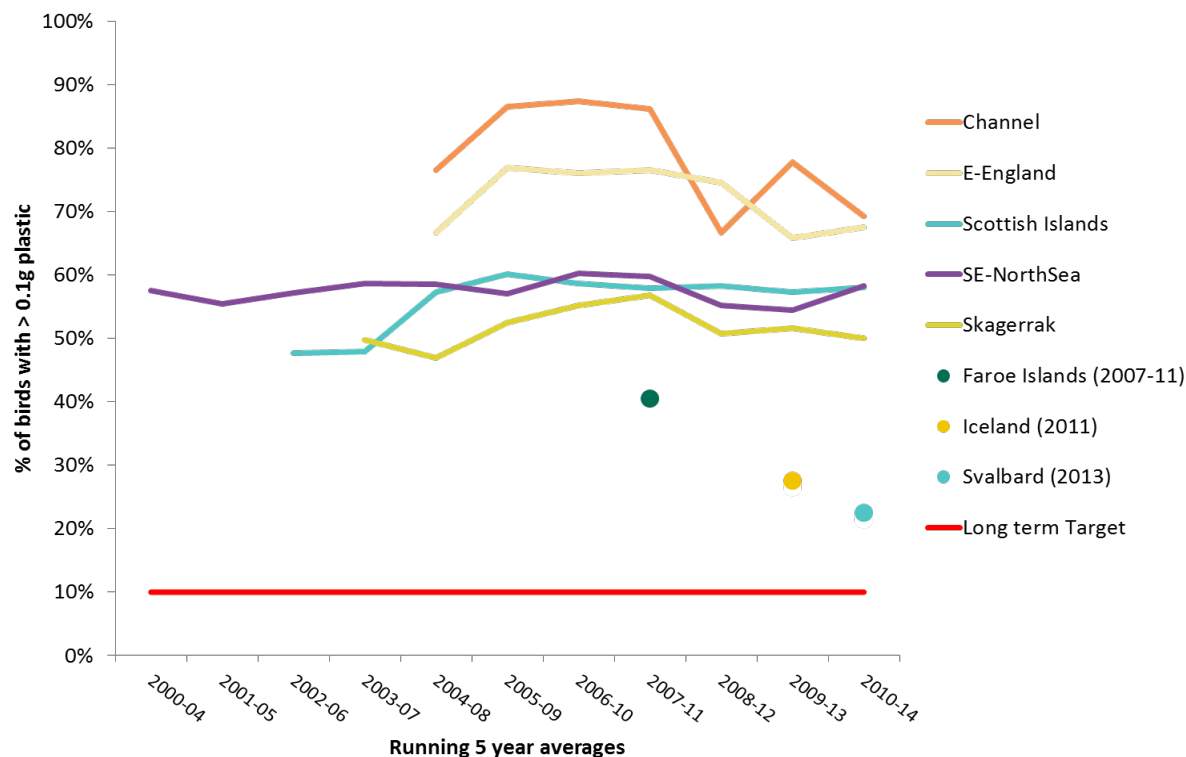


Figure 2: Running five-year averages for the percentage of fulmars having more than 0.1 g of plastic in their stomach since 2000 and/or the start of sub-regional participation in the monitoring programme. *Incidental data published for the Faroe Islands, Iceland and Svalbard are included to illustrate lower levels further north in the OSPAR Maritime Area, but nevertheless still well above the OSPAR long-term goal*

Knowledge Gaps

The OSPAR Common Indicator on Plastic Particles in Fulmar Stomachs aims to reflect litter floating at the surface, and the potential harm from marine litter in the North Sea environment to pelagic (open sea) marine organisms. However, the fulmar monitoring effort does not give direct information on ‘harm’ or ‘damage’ but simply quantifies spatial and temporal patterns in abundance of plastics in fulmar stomachs as an indirect measure of harm. Dedicated experimental laboratory-based research into evidence of harm to fulmars from specified levels and types of plastics, as a specific example of harm, is urgently needed to strengthen the role of the OSPAR Common Indicator.



Image: Beached fulmar © JA van Franeker
Inset: Plastics from a fulmar stomach © JA van Franeker

Conclusion

Since the early 2000s, levels of plastic ingestion by fulmars in the North Sea appear to have stabilised at around 60% of individuals exceeding the 0.1 g level of plastic ingestion specified in the OSPAR long-term goal definition. When considering the growth in marine activity and the increasing proportion of plastics in wastes, the observed stability in the indicator could be viewed positively. Even though the OSPAR long-term goal is still distant, it remains valid as a global assessment level.

Fulmar populations in the North Sea are currently in decline, as highlighted in the Marine Bird Abundance indicator assessment, but the causes of the decline are not well understood. Ingestion of plastic litter is recognised as a potential threat contributing to the status of fulmar populations, given that it is probable that sub-lethal effects of reduced body condition and health, affect a significant proportion of individuals in the population.

The OSPAR Regional Action Plan identifies actions to reduce marine litter and their implementation should lead to a reduction in the amount of litter ingested by fulmars.