

SEA, BEACH AND BIRDS: PLASTICS EVERYWHERE

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International attention to marine debris has recently increased as the annual global production of plastics is augmenting and the build-up of these materials in the environment may become problematic. The AS-MADE project (Assessment of Marine Debris) aims to assess the occurrence and distribution of debris (mainly plastic litter) in the Belgian marine environment. This project is conducted by the Laboratory of Environmental Toxicology and Aquatic Ecology of Ghent University (project coordinator), the Research Institute for Nature and Forest (INBO), the Coordination Centre for Integrated Coastal Zone Management (ICZM) and the Flanders Marine Institute (VLIZ).

The occurrence of (plastic) litter was observed offshore (floating litter and litter on the seafloor), on beaches as well as in the seabirds. The latter was performed by analyzing existing data on stomach contents of beached Northern Fulmars (*Fulmarus glacialis*) and on entanglement of beached birds along the Belgian coast.

In the offshore Belgian waters, the ship-based surveys of floating litter suggested that for each swimming Razorbill (*Alca torda*) there is one larger piece of plastic floating around (0.66 items per km²) (Vanermen and Stienen, 2009). Sheet-like plastics (packages and wraps), party balloons and fishing gear were commonly observed floating litter. On the seafloor, on average approximately 2500 plastic items per km² were found, consisting mainly of fragments of monofilament line and fragments of hard plastic.

On the beach both debris and beached birds were sampled. Marine debris surveys were conducted on 4 Belgian beaches with differing tourism intensity and different sedimentation/erosion regimes. Up to 4.5kg (7852 items) of small debris per 100m beach was collected of which 72% (~3.24kg) was plastic. At least 12% of this debris was related to tourism. On average 4873 industrial pellets were collected per 100m beach.

Ingestion and entanglement are two major threats of plastics to seabirds. Entanglement of birds in plastics has been monitored along the Belgian coast since 1962. Our study indicates that some species are more sensitive than others (with Northern Gannets *Morus bassanus* being highly sensitive) and that fishing gear is the main threat. Beached Northern Fulmars are used as offshore plastic pollution indicators because they accumulate large quantities of plastic items in their stomachs. About 95% of all individuals found along the Belgian beaches contained plastics with 56% containing industrial pellets and 94% user plastics (i.e. small parts of sheet-like plastics: foil/wraps/..., threadlike plastics, foamy plastics, and fragments: bottles/boxes/toys/lighters/... or cigarette filters, rubber, rubber bands, etc). Furthermore more than half (51%) of the beached Fulmars had more than 0.1g of plastic in their stomachs, which is much higher than the proposed OSPAR (Van Franeker et al., 2005) guideline: i.e. no more than 10% of the birds should contain more than 0.1g of plastics. This study demonstrates that different types of plastics are present in each compartment of the Belgian marine ecosystem have an impact on the seabird health.

References

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