Density estimates of marine litter in a key cetacean habitat in north west Scotland

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Introduction

Marine litter is a conservation concern for cetaceans owing to entanglement and ingestion (Laist, 1997). Over the last 50 years, plastics have become particularly problematic; these materials are buoyant, slow to degrade, and can be carried thousands of kms by winds and currents (Laist et al, 1999). Hebridean waters are an important foraging habitat for cetaceans, and also remote from major identifiable direct sources of pollution. We present the first quantitative assessment of floating pollution in this area.

Methods

Line transect surveys were conducted from research vessel *SV Silurian* over the 2006 research season (May to September), to quantify the level and composition of marine litter in Hebridean waters. For each litter sighting, the type of litter, and its distance from the beam of the vessel was recorded. Data collected within a core sampling area of the Inner Hebrides, at sea state less than 3, when 2 or more observers were on station were used for analysis, a total of 460 survey hours. Rubbish density was estimated using standard distance sampling methodologies (Buckland et al, 2001) using Distance version 5.0.

Results

A total of 547 items was observed, 71% of which were confirmed as plastics. Plastic bags and plastic bottles were the items most commonly observed (37% and 18% of total respectively). Rubbish density was estimated to be a minimum of 4.62 pieces km^{-2} (95% CI 3.31 – 6.47). The effective strip width was 13.6m (95% CI 12.52 – 14.72).

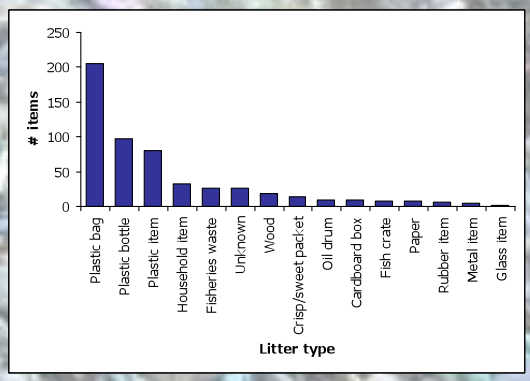

Fig.1 Breakdown of litter type

Discussion and Conclusions

Worldwide, there is considerable variation in the estimations of marine litter density (see Dufault and Whitehead, 1994). However, the figure of 4.62 pieces km^{-2} is noteworthy, as Hebridean waters are not close to land masses with evident sources of litter. Furthermore, this figure draws solely on floating rubbish large enough to be observed at the surface. Sea conditions also influence the sightability of floating pollution. This is therefore a conservative estimate; total levels of marine litter are likely to exceed this figure. This represents a conservation challenge for the region's marine ecosystem.

References

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Acknowledgements

Many thanks to the crew and volunteers on Silurian and our funders, Heritage Lottery Fund, Argyll and Islands Enterprise, Scottish Natural Heritage, WWF, Earthwatch Institute