



**OSPAR
COMMISSION**

*Protecting and conserving the
North-East Atlantic and its resources*

MARINE LITTER



KIMO International

PREVENTING A SEA OF PLASTIC

MARINE LITTER (PLASTICS AND OTHER MAN-MADE OBJECTS) causes serious environmental, economic, safety, health and cultural impacts. Millions of marine mammals, birds, turtles and fish perish as a result of entanglement or ingestion of deliberately or accidentally discarded debris.

Marine litter is found in all the world's oceans, from the poles to the equator, from continental coastlines to small remote islands. It occurs not only close to densely populated coasts, but also in remote places far away from any obvious sources.

Marine litter consists of slow degrading materials. The continuous input of large quantities of such items from many land- and sea-based sources results in a gradual build-up in the marine and coastal environment. Marine litter spoils beaches, floats on the surface, drifts in the water column, and is even found on the deep seabed.

Marine litter is entirely due to human activity, and therefore can and has to be controlled by human management.

This leaflet has been jointly produced by UNEP and OSPAR to raise the awareness about the vast and growing threat caused by marine litter. It highlights the work of UNEP and the practical measures and steps taken by the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic with a view to guiding and inspiring similar action in other regions of the world.



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Marine litter



H Schwarzenbach/UNEP/Still Pictures



Quest-ROV/MARUM, Univ. Bremen

Marine litter is a complex and multi-dimensional problem, with significant implications for the marine and coastal environment and human activities all around the world. In 2005, the UN General Assembly:

- noted the lack of information and data on marine debris and encouraged States to develop partnerships with industry and civil society to raise the awareness of the extent of the impact of marine debris;
- urged States to integrate the issue of marine debris within national strategies dealing with waste management;
- encouraged the development of appropriate economic incentives to address this issue; *and*
- encouraged States to cooperate regionally and sub-regionally to develop and implement joint prevention and recovery programmes for marine debris.

Many organizations and programmes have now dedicated themselves to fight marine litter at the national, regional and global level. In 2005, UNEP published a report *Marine Litter: An analytical overview* with expert recommendations to guide and strengthen coordinated action in combating marine litter.

Many countries have taken steps at the national level and under regional organizations, such as OSPAR, to address the marine litter problem through:

- legislation and enforcement of international agreements;
- provision of reception facilities for ship-generated wastes;
- cooperative action within the fishing sector to prevent the abandonment and discarding of fishing gear;
- improvements in waste management practices; *and*
- beach clean-ups, underpinned by information, education and public awareness programmes.

Despite this work and effort, it appears that the threat and impact from marine litter is continuing to grow. Some 8 million items of marine litter are being dumped in oceans and seas every day, accumulating to about 6.4 million tonnes per year. Over 46,000 pieces of plastic litter are floating on every square kilometre of ocean today. In the Central Pacific, there are up to 3 kilogrammes of marine litter to every kilogramme of plankton.

Much more still remains to be done.

GLOBAL THREAT: GLOBAL CHALLENGE

A review and analysis of UNEP's Global Initiative on Marine Litter highlights that significant efforts have been made by Regional Seas Conventions and Action Plans to quantify the problem, prepare action programmes and participate in an International Coastal Clean-Up Campaign. Additional efforts include development of UNEP/IOC Global Guidelines, UNEP/FAO work on Abandoned and Lost Fishing Gear and further work on market-based instruments. OSPAR is one of 12 regions tackling marine litter through partnership and cooperation.



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Assessing the problem

OSPAR's *Assessment of the Marine Litter Problem in the North-East Atlantic Maritime Area and Priorities for Response* recognizes that marine litter is a significant problem and is a first step in addressing the challenge of managing marine litter in a sustainable way.

Its purpose is to assess the scale of the problem, to establish the main sources of marine litter, and to set priorities. It draws on previous work on marine litter in the North Sea that identified the need to develop a harmonized methodology. The result is a comprehensive analysis of quantities, composition and trends of marine litter on beaches throughout the OSPAR Maritime Area.

The *Assessment* illustrates how levels of marine litter have remained high but steady between 2001 and 2006 (see Figure 1), although the spatial distribution varies. At the global scale, estimates indicate that nearly 80 per cent of marine litter originates from land-based sources. The *Assessment* confirms these pathways, with the majority of debris entering the North-East Atlantic by rivers, tourism, fly tipping, local businesses and unprotected waste disposal sites, and from shipping, the fishing industry and offshore oil and gas installations, respectively.



The German participants in the OSPAR pilot project

The OSPAR *Assessment* also considers the financial impact of marine litter. In the United Kingdom alone, the cost to authorities, industry and coastal communities of cleaning up marine litter amounts to approximately \$28 million per annum.

Plastics and marine ecology

Plastic poses a major threat to marine mammals, birds, turtles and fish due to entanglement and ingestion. Plastic and polystyrene account for approximately 75 per cent of marine litter. Beach bird surveys indicate that 12 per cent of all gannet corpses on German and Dutch beaches are found entangled. Ninety-four per cent of the seabirds investigated in the North Sea had ingested small plastic particles from floating litter, with 55 per cent of birds having more than 0.1 gram of plastic in their stomachs.

Another emerging threat is the ingestion by marine organisms of microscopic plastic particles accumulating in the pelagic zone and sedimentary habitats at concentrations of 150-2,400 particles per m³.

Marine litter causes further ecological damage by dispersing invasive alien species which 'hitch-hike' on floating debris.



NOAA Marine Debris Programme/Ocean Conservancy

The *Assessment* draws conclusions and guides the huge amount of work that still needs to be done to combat marine litter, ranging from raising awareness and putting regulations into place, to setting up practical programmes and measures.

Monitoring our beaches

OSPAR Beach Litter Survey on the island of Sylt



sources and quantitative trends in marine litter were identified on the beaches of nine OSPAR Contracting Parties (Belgium, Denmark, France, Germany, The Netherlands, Portugal, Spain, Sweden and the United Kingdom).

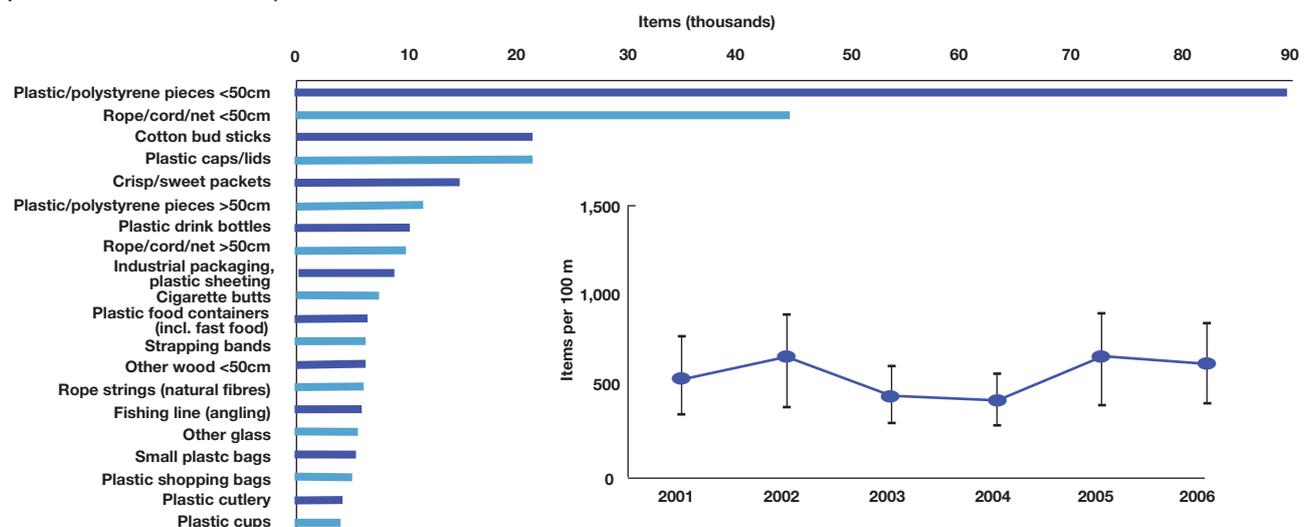
The project's final report is based on a statistical analysis of marine litter from 609 surveys, using a common, standardized survey protocol on 100 metre stretches of 51 regular reference beaches monitored during the pilot project period (2001–2006), supplemented by 335 surveys of 1 kilometre stretches on 31 regular reference beaches during the same period. Additional surveys were carried out during 2006 on four beaches in France.

Using specific marine litter items as indicators, the statistical analyses of the beach data identified five main sources: fishing (including aquaculture), sanitary waste/sewage related waste, operational waste from shipping (including offshore activities), galley waste (non-operational waste from shipping, fisheries and offshore activities), and tourism and recreational activities.

Beach surveys provide important information but not necessarily the full picture of the total load of marine litter in the coastal and marine environment. However, due to its region-wide scope, the methodology and findings of the Pilot Project have provided a major step forward in the analysis and better understanding of the sources and trends of marine litter in North-West Europe.

The OSPAR *Pilot Project on Monitoring Marine Beach Litter* (which formed a basis for the *OSPAR Assessment*) was the first region-wide project in Europe to develop a standard methodology for monitoring marine litter found on beaches. The

Figure 1. Composition and numbers of marine litter items found on reference beaches. The bar chart shows the total numbers of the most common items. The points in the line diagram represent the average of annual averages for individual beaches (Error bars = 95 per cent confidence interval)



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Cost-effective solution: *fishing for litter*

Notwithstanding the need to prevent litter in the first place, OSPAR has promoted 'fishing-for-litter' as a practical, simple yet effective means to reduce litter in the marine environment. The project targets the fishing industry by asking fishermen to voluntarily collect marine litter caught up in their nets in large hard-wearing bags provided by the project. The amount and types of litter are recorded onshore before being disposed of in an environmentally friendly way.

OSPAR published a *Background Report on Fishing-for-litter Activities in the OSPAR Region* and adopted guidelines on how to develop a 'fishing-for-litter' project. Implementation of such projects throughout the OSPAR region, however, requires considerable effort as it involves many stakeholders. The fishing industry has to endorse the concept, local ports and harbour authorities have to support it, and waste disposal authorities need to be involved. The success of the initiative depends on a change of culture – as well as the adoption of good waste management practices. In addition, the fishing industry or local communities should preferably not have to bear any financial burden associated with the project.

It has been calculated that the estimated 20,000 tonnes of marine litter dumped annually in the North Sea could be reduced by 10 per cent if 'fishing-for-litter' projects were to be implemented throughout the OSPAR maritime area. Together with large-scale, regular and targeted clean-up operations funded by



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government agencies, 'fishing-for-litter' has the potential to significantly reduce marine debris, thus decreasing environmental impact and economic costs to the fishing industry and society as a whole.

For example, during 2007-2008 10 Belgian fishing vessels participated actively in waste removal. Most of the litter was found on the seabed and 72 bags were collected. As a reward, fishermen received €5 (\$6.50) for every bag delivered. The cost of the project is estimated at €21,700 (\$28,000) per annum.

Working together

In-between meetings, work within the OSPAR Commission is often undertaken by intersessional correspondence groups (ICGs). These 'think tanks' are very effective in involving experts from governments and non-governmental organizations with a particular interest in specific topics. ICG-Litter actively develops OSPAR methodologies, position statements, data collection and lessons learned. It uses an electronic forum as a cost-effective means to exchange views and information. Formal meetings are held to refine assessments and strengthen the good working relationships.

KIMO International has a lead role within the OSPAR marine litter work. As a non-governmental organization, KIMO represents regional governments and is an important interface between

regulators and commercial users of the sea. KIMO has comprehensively studied marine litter around the Shetland Islands (UK) including cost implications for land owners and local authorities. In 2000, KIMO estimated that the cost of marine litter to the Shetland community, with a population of 22,000 inhabitants, could be as much as £5,662,840 (€7,119,600/\$8,102,960) per year.

On behalf of OSPAR, KIMO has recently completed a major marine litter assessment for the North-East Atlantic with the support of OSPAR Contracting Parties and the financial support of UNEP. KIMO has also initiated discussion with the plastics industry and other stakeholders whose products could end up in the sea.

Looking *forward*

Closer interaction between the European Union, the Regional Seas Conventions and governmental and non-governmental organizations means more efficient use of resources. With the adoption of the European Marine Strategy Framework Directive, OSPAR has identified marine litter as one of the key areas where knowledge and expertise can be shared. OSPAR's experience in this area could be used as a point of departure by other organizations within and beyond Europe.

The OSPAR Pilot Project on Monitoring Marine Beach Litter is the first project to develop a standard methodology, a major step in comparing data on marine litter and analysing results. This methodology is contributing to UNEP's global guidance and the International Maritime Organization's review of MARPOL Annex V on garbage.

'Fishing-for-litter' is another project which could easily be transferred to other Regional Seas Conventions and developing countries by adapting the OSPAR guidelines to suit local needs.

The *Assessment of the Marine Litter Problem in the North-East Atlantic Maritime Area and Priorities for Response* has provided a snapshot of the extent of marine litter pollution. Further surveys and analysis of the results of the assessment should be carried out for a more comprehensive picture of marine litter pollution in the North-East Atlantic.

OSPAR is proud of its pioneering track record and proactive approach in the fight against pollution. Its next challenge is to address the socio-economic effects of human activities. Working together, it is important to make explicit the costs of marine litter to society.



Insets: top and bottom left. Steven Siegel/Marine Photobank; top right, NOAA/NMFS

Main photo: Dr. James P. McVey (NOAA Sea Grant Program)

Midway Island: past - present - future? The aerial view of a beach on Midway Island was taken in June 1969. Since then, Midway Island has been inundated with marine litter due to its location in the centre of the 'Great Pacific Garbage Patch', an area roughly the size of Texas, where ocean currents have trapped and accumulated millions of tonnes of suspended plastic and other debris. The inset pictures show the profound impact marine litter has on the wildlife and ecology of the Midway Island, home to 2 million Laysan Albatrosses. Nearly all of these birds have plastic in their digestive system, and approximately one-third of their chicks die in their nests from ingestion of marine litter. Volunteers carry out regular clean-up operations, and the US Government is launching a \$500,000 marine debris campaign at Midway Island National Wildlife Refuge – however, without reducing the sources of marine litter, these actions will hardly stem the plastic tide.

Concerted action is needed to FREE our beaches, coasts and seas from the bane of marine litter.

This is the first in a series of joint UNEP/OSPAR factsheets to raise the awareness of pertinent marine issues. Further information, including the UNEP and OSPAR activities, reports and publications referred to in the text, can be found at www.unep.org/regionalseas/marinelitter and www.ospar.org.



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