

Swedish efforts to reduce marine litter pollution

SUSTAINABLE DEVELOPMENT GOALS, TARGET 14.1:

By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.



EXECUTIVE SUMMARY

- Marine litter is a growing global problem, causing negative effects on the marine environment and socio-economic costs to our society as a whole.
- Litter enters the ocean from both land- and sea-based sources. Rivers can act as important routes for carrying litter to the ocean, even from sources far from the coast. In addition, currents and winds can transport buoyant litter, such as plastics, long distances.
- Plastic items make up the largest fraction of marine litter. Plastics can be very durable in the marine environment. They can therefore remain for centuries and accumulate if not cleaned up. Plastic items may also break down into tiny pieces, so-called microplastics.
- The loss of waste and material, especially plastic, is a loss in resources. Efficient use of material and waste is both economically and environmentally beneficial.
- Marine litter needs to be treated as a cross-sectoral and transboundary issue, where strong measures need to be implemented from the local to the global level. Success factors for reducing marine litter pollution include strong political will and a robust regulatory framework. It also includes changed production and consumption patterns, public awareness and changes in behaviour, adequate waste management both on land and at sea, as well as appropriate wastewater and storm water systems.
- Systematic monitoring is an essential foundation for efficient marine pollution management.
- There are several knowledge gaps, but we know enough about the effects on our environment and society in order to take precaution and act.
- Via regional cooperation, we can coordinate and share costs of monitoring, analysis, research and mitigation of marine litter pollution.
- Most of the sustainable development goals (SDGs) are interlinked with one another. SDG 12, Responsible consumption and production, plays an especially vital role in fulfilling SDG 14.



SWEDEN

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Introduction

Marine litter is a global environmental problem that is growing, causing negative effects on marine life and the provision of ecosystem services as well as on socio-economic costs to our society as a whole. Marine litter originates from a variety of sources and enters the ocean from activities both on land and at sea, such as from commercial and recreational shipping. In addition, rivers can act as important routes for carrying litter from sources that are far from the coast. In Sweden, marine litter is an environmental problem, especially along the northern parts of the Swedish west coast where prevailing currents and winds drive up to 8,000 cubic metres of litter annually onto the shore. This situation makes the area one of the most polluted areas of marine litter in Europe.

Awareness of marine litter has increased. Several policy instruments and legislations are in place for handling the main sources of marine litter, both at national and international levels. However, the problem is still growing globally.



MARINE LITTER originates from a variety of sources and enters the ocean from activities both on land and at sea.

This indicates that current policy instruments might be inefficient or need to be complemented. Marine litter is a cross-sectoral problem, and tackling it requires changes in behaviour and production and consumption patterns, technical solutions and innovations, adequate waste management both on land and at sea, and appropriate wastewater and

storm water systems. Marine litter is also a transboundary problem that stresses the need of working across different scales, from the local to the global level.

Plastics make up the largest fraction of marine litter. The production and use of plastic material has drastically increased since the 1950s. The fact that plastic is often lightweight and durable makes it useful to society, but it is a significant threat to the marine environment. It is estimated that several million tons of plastic ends up in the oceans every year. Since the majority of plastic materials takes a very long time to degrade (from decades to even centuries), plastic litter in the marine environment is very persistent and accumulates unless cleaned up. Plastic items are often buoyant and can therefore drift large distances and end up far away from their original source. The fact that marine animals can ingest plastic litter and become entangled in it – with starvation and drowning as a consequence – is one of the main environmental issues of marine litter.

Plastic items will eventually break down into smaller pieces, so-called microplastics which are particles smaller than 5 mm. As these particles are impossible to clean up, it is expected that their concentrations will increase in the future. Microplastics are found in basically all studied marine environments and are ingested by a broad range of marine organisms. Experiments indicate that microplastics may have adverse effects, at least when ingested in high concentrations. Since plastic materials sometimes contain toxic substances or even accumulate hazardous substances from the marine environment, another issue is the risk of toxic substances entering the food web through this source. The environmental effects of microplastics have recently begun to be studied.

Marine litter is now recognised as a serious environmental issue, and our ambition should be working toward close-to-zero litter in the marine environment. Even so, there is a need to find realistic baselines and threshold values. Despite the knowledge gaps, we know enough about the effects on our environment and society in order to take precaution and act.



SINCE 2009 the municipalities along the northern part of the Swedish west coast has worked together in different projects to make their cleaning efforts more effective as well as to highlight the special situation of high amounts of marine litter floating ashore on their coast line.

National efforts

Awareness of marine litter has increased in the past thirty years, both in Sweden and worldwide. The Swedish foundations Keep Sweden Tidy and the West Coast Foundation together organized the Year of Clean Beaches in 1987–88. Keep Sweden Tidy works nationally and internationally with public information and active cleaning efforts. The West Coast Foundation continued for several years to coordinate the municipalities' cleaning efforts along the coast. Since 2009, municipalities along the northern part of Sweden's west coast have worked together in various projects to make their cleaning efforts more effective, and to highlight the serious amount of marine litter floating ashore on their coastline. The Swedish Agency for Marine and Water Management (SwAM) supports several such projects with the aim of reducing and preventing marine litter.

In Sweden, several policy instruments and legislations are in place for handling the main sources of marine litter. Nevertheless, the problem is growing globally. This affects Sweden and indicates that current national policy instruments need to be complemented with international efforts. Sweden therefore prioritises efforts against marine litter within two of the Regional Sea Conventions – OSPAR for the North-East Atlantic and HELCOM for the Baltic Sea – as well as within the EU's Marine Strategy Framework Directive (MSFD). The MSFD was incorporated into Swedish law in 2010, which means that Sweden now partially has a

monitoring program for marine litter (which includes litter on the beach and seabed but excludes microlitter monitoring) and a program of measure (PoM) for marine litter. The PoM includes five measures directed toward the reduction of abandoned, lost, and discarded fishing gear; public awareness campaigns; coastal beach cleaning in particularly affected areas; and the inclusion of marine litter into national and local plans on waste prevention and management.

Sweden's waste management is based on high levels of recycling and reuse, with incineration as the final step rather than landfill. This reduces the risk of large quantities of litter being lost to water and air. Strict requirements for sewage treatment result in improved litter removal. For example, Europe's largest disk filter installation, in Gothenburg, Sweden, removes particles as small as ~0.3 mm, although removal at source would be even better, especially as particles smaller than ~0.1 mm pass through the cleaning steps to a much higher extent and end up in the environment via the effluents. It is estimated that a single waste water treatment plant releases about 1.7 million to 140 million microplastic particles into the Baltic Sea every day.

The Swedish Environmental Protection Agency is assigned to identify important sources of microplastics in the sea and to work toward reducing the production and emission of microplastics from these sources. The assignment will be reported to the government in June 2017. Meanwhile, the

Ministry of the Environment and Energy has proposed national measures for restricting the occurrence of microplastics in cosmetic products. In other words, the proposal seeks to ban all such products on the market that contain plastic particles for cleansing, scrubbing, and polishing, and are intended to be removed or spat out after having been used in hair or on skin, mucous membranes, or teeth. The Swedish Chemicals Agency is assigned to investigate the occurrence of plastic particles in other kinds of cosmetics as well as chemical products, and to propose measures in order to reduce the discharge of plastic particles in waste water. This assignment will be reported to the government in December 2017. In line with an EU directive, Sweden recently decided to reduce the use of plastic bags from a maximum of 90 bags per person per year by 2020 down to 40 before 2026.

Regional efforts

At the EU level, a wide range of policies and directives addresses the source and impact of marine litter. This includes legislation on waste management, urban wastewater, and pollution from ships. The MSFD is the dedicated binding legal instrument for assessing, monitoring, and setting targets to reach good environmental status with regard to marine litter. The MSFD is implemented nationally and coordinated regionally. The EU itself is a signatory to the Regional Sea Conventions and recognises them as the platform for regional coordination. Thus, strong synergies exist between the MSFD and the Regional Action Plans on Marine Litter, mentioned below. In addition, the EU Plastic Strategy may play an important role in preventing marine litter.

Sweden makes extensive use of HELCOM and OSPAR to drive work and share management costs. The conventions work through a process of assessing pressures and impacts through thematic assessments and using recommendations, action plans, and agreements to develop and ensure best practices. One example is the OSPAR recommendation on “fishing for litter” initiatives. Yet another is the HELCOM recommendation on the no-special-fee system for ship-generated waste and marine litter caught in fishing nets.

OSPAR and HELCOM developed, in 2014 and 2015 respectively, Regional Action Plans on Marine Litter (RAP ML) with member countries sharing responsibility for actions, and mitigation work often being completed by nationally funded NGOs. The action plans address both land- and sea-based sources and are divided into regional and voluntarily national actions. The regional actions address problems requiring cross-scale reinforcement and collective action by contracting parties. The voluntary national actions primarily address problems of national concern. The RAP ML also provide a platform to address issues of regional relevance that have not yet been included in EU legislation, and even help contracting parties to approach global actors where the EU is not represented.

Sweden is co-lead for two regional actions within the RAP ML. One is about preventing and reducing marine litter within the fishing sector and the other is about preventing and reducing litter, including microlitter, from entering the marine environment via wastewater. In line with our regional work, Sweden supports two EU projects: MARE-LITT Baltic aims to reduce the impact of derelict fishing gear in the Baltic Sea, and BLASTIC aims to reduce plastic waste and, consequentially, the inflow of hazardous substances into

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the Baltic Sea by mapping and monitoring the amounts of litter in the aquatic environment.

Marine litter issues exist on the agendas of many actors, and various processes of relevance for OSPAR's and HELCOM's Regional Action Plans on Marine Litter are ongoing. Sweden therefore supports a scoping study on international and European processes that are relevant and could contribute to the implementation of OSPAR's and HELCOM's RAP ML.

OSPAR and HELCOM have working groups committed to developing monitoring programs and indicators for marine litter. To their help, they have a dedicated subgroup at the EU level working on these issues in order to support member states in reaching good environmental status for marine litter. In addition, the EU platform JPI Oceans runs four research projects investigating the impact of plastic particles on the marine environment. JPI Oceans is supported by Sweden and nine other countries.

Sweden is also active within the Arctic Council which recently decided to more actively engage in the issue of marine litter.

Interaction and links to other analysis areas

Large amounts of marine litter, as well as microparticles and litter ingested by marine animals, act as a disturbance on the ecosystem and can have a negative impact on ecosystem services like food web dynamics, maintenance of biodiversity, habitats, and resilience.

Awareness of marine litter as an environmental problem works as a driving force toward better waste management and resource efficiency. This, in turn, could have a positive impact on our climate. It also draws more attention to the need of adequate wastewater and storm water treatment which links to the reduction of other marine pollutants such as nutrients and hazardous substances. Classical nutrient retention approaches, in the form of water retention measures, reduce the risk of untreated sewage overflow by delaying the run-off from land and reducing the maximum flow. These measures also reduce flows of litter and hazardous substances to the marine environment.



LARGE AMOUNTS of marine litter, including lost fishing equipment, acts as disturbance on ecosystems and their services. Thus our ambition should be working towards close-to-zero litter in the environment.

CHALLENGES AND GAPS

- Marine litter is a cross-sectoral and transboundary problem in which the resolution of the problem requires the involvement of a variety of actors from the local level all the way to the global scale.
- The amount and composition of marine litter varies greatly from one region to another and depends on a number of factors. Thus, even if much is to be won by sharing experiences and knowledge between different regions, one must adapt the measures to fit one's own context.
- Marine litter is recognised as a serious environmental issue and our ambition should be working toward close-to-zero litter in the marine environment. Even so, there is a need to find realistic baselines and threshold values.
- Knowledge gaps exist. For example, the environmental effect of microplastics has just begun to be studied and our picture of where marine litter accumulates in the marine environment is fragmentary. Monitoring is therefore essential, even though it does not give us the whole picture. Despite the knowledge gaps, we do know enough about the effects of marine litter on our environment and society in order to take precaution and act.
- Current consumption and production patterns give rise to marine litter which poses a vast and growing threat to marine and coastal environments. Ways to decrease this impact are needed. For example, environmental taxation and/or deposit schemes on plastic materials and certain key marine litter items could be used to add value and incentives for better material governance and litter recovery in order to close the loops and enhance circular economy. In addition, new partnerships that explore extended producer responsibility for financing the construction of recycling infrastructure and waste management could be a model for further development.
- Bioplastics (plastic particles that are either bio-based, biodegradable, or both) are sometimes proposed as a way to mitigate marine plastic litter. However, the term 'biodegradable' does not imply that bioplastic materials are easily degradable in the marine environment. There is a lack of scientific study on the degradation of bioplastics in the marine environment and the potential harmful effects on organisms. More studies are needed before advocating bioplastics as a solution to marine litter. In addition, attitudes toward littering could become more relaxed regarding plastic that is termed as biodegradable. It is important that we continue to focus on minimising the use of single-use plastics and plastic bags, and decreasing marine litter regardless of origin.
- Microlitter derives from a variety of sources that we have not perceived earlier, implying that we need to think in new terms when technical solutions, materials, and infrastructure are developed.
- Another emerging class of marine litter is engineered nanoparticles which are used in a wide array of products, from cosmetics and biomedicine to agriculture. Laboratory studies indicate that nanoparticles can have harmful effects in invertebrates and fish. More research on the effects on humans as well as the environment is needed, and precautions should be used when applying nanoparticles in applications from which they might be spread to the environment.

Compilations made by SwAM for SDG 14, Life below water

- This document represents one out of nine compilations made by the Swedish Agency for Marine and Water Management (SwAM) to highlight Sweden's key efforts and initiatives for Sustainable Development Goal 14 of the 2030 Agenda for Sustainable Development. It has been developed as a part of Sweden's work in support of The Ocean Conference in New York, June 5–9, 2017.
- Several other Swedish agencies and institutions have contributed to the content in these compilations: the Swedish Environmental Protection Agency, the Swedish International Development Cooperation Agency (Sida), the Swedish Meteorological and Hydrological Institute (SMHI), the Swedish Board of Agriculture, the Swedish Chemicals Agency, the Swedish Transport Agency, and the Swedish Institute for the Marine Environment (SIME).
- The documentation focuses on a situation assessment and does not constitute a complete picture of Sweden's initiatives being carried out in order to achieve the goal and targets. A starting point for the content is operational areas within national authorities, but the content has also been expanded to include other significant aspects based upon existing contacts and knowledge.
- Furthermore, the Swedish Environmental Research Institute (IVL) has been commissioned by SwAM to compile initiatives and examples from Sweden's industry and blue growth sector. The Sustainable Development Solutions Network (SDSN) Northern Europe has also composed a complementary compilation of efforts from innovative blue growth initiatives. The result of this work is presented in separate reports.
- The Swedish Institute for the Marine Environment has been commissioned by SwAM to produce two syntheses in support of the conference. One concerns mitigating marine eutrophication in the presence of strong societal driving forces, with a focus on impacts and measures, and the other concerns impacts and measures regarding marine litter in small island developing states.

