

**Regional Action Plan on Marine Litter in the Arctic**

**PROTECTION OF THE aRCTIC mARINE eNVIRONMENT**

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# Executive Summary

***Note: To be written at a later stage***

# Introduction

Marine litter, particularly when made of plastic, is amongst the most pervasive problems affecting the marine environment globally (United Nations Environment Programme (UNEP), 2009; United Nations General Assembly (UNGA), 2012; UNEP, 2016). The presence of litter in the oceans is ubiquitous and has been recorded from coastal shallow waters to the seafloor of the deepest oceanic trenches and basins, and like all other regions in the world, marine litter, including microplastics, now exist in the Arctic Ocean. The serious threat that marine litter poses to the marine environment is globally recognized. [Governments attending the first UN Environment Assembly (UNEA), held in June 2014, noted with concern “the serious impact which marine litter, including plastics stemming from land and sea-based sources, can have on the marine environment, marine ecosystem services, marine natural resources, fisheries, tourism and the economy, as well as the potential risks to human health”]. [Resolutions from the four UNEA sessions to date have requested that UNEP undertake further studies, and call for further action. UNEA recognized “that measures need to be taken and adapted as appropriate to local, national and regional situations” (UNEA Resolution 2/11, 2016). In 2017 (UNEA Resolution 3/7) noted the importance of long term elimination of discharge of litter and microplastics into the oceans and an Ad Hoc Open-Ended Expert Group on Marine Litter and Microplastics was established to identify the range of national, regional and international response options**.]**

Actions to address this global issue are being taken at multiple levels, including taking both a regional and sectoral approach in order to address the key challenges and context for different regions and sectors. To date this has been done largely through Regional Seas Progammes and other intergovernmental bodies, such as the International Maritime Organization (IMO) and Food and Agriculture Organization (FAO). The Arctic is a region with unique geographic, climatic, and geopolitical context, and so it follows that the actions needed to address the pervasive problem of marine litter within this region must take that unique context into account.

The Arctic Council is the leading intergovernmental forum promoting cooperation, coordination and interaction among the Arctic States, Arctic Indigenous Peoples and local communities on common Arctic issues, in particular on issues of sustainable development and environmental protection in the Arctic. It regularly produces comprehensive, cutting-edge environmental, ecological and social assessments through its working groups.

**Arctic Council working groups will coordinate and cooperate closely in the implementation of this action plan, as relevant to their mandate:**

**PROTECTION OF THE ARCTIC MARINE ENVIRONMENT**

PAME: Addresses marine policy measures in response to environmental change from both land and sea-based activities.

**ARCTIC MONITORING & ASSESSMENT PROGRAMME**

AMAP: The Arctic Monitoring and Assessment Programme Working Group (AMAP monitors and assesses pollution and climate change issues in the Arctic.

**CONSERVATON OF ARCTIC FLORA & FAUNA**

CAFF: Addresses the conservation of Arctic biodiversity, helping to promote practices which ensure the sustainability of the Arctic’s living resources.

**ARCTIC CONTAMINANTS ACTION PROGRAM**

ACAP: Contributes to the efforts to reduce environmental risks and prevent pollution of the Arctic environment.

**SUSTAINABLE DEVELOPMENT WORKING GROUP**

SDWG: Focuses on the human dimensions of the Arctic. It works to protect and enhance the environment, economy, social conditions and health of Indigenous communities and Arctic inhabitants.

**EMERGENCY PREPAREDNESS, PREVENTION AND RESPONSE**

EPPR: Focuses on the prevention, preparedness and response to environmental emergencies, search and rescue, natural and manmade disasters and accidents in the Arctic.

Arctic Council Ministers representing the eight Arctic States and representatives from the six Permanent Participant organizations met in Rovaniemi, Finland in May 2019. At that time, the Arctic Council Chair released the statement which *“noted with concern**that marine litter, including plastic and microplastics, represents a serious environmental problem on a global scale, including in the Arctic, welcomed the Desktop Study on Marine Litter and supported the development of an Arctic regional action plan for reducing marine litter*.”[[1]](#footnote-2)

## Context for the Regional Action Plan

PAME has a long history of addressing pollution in the Arctic marine environment. With the adoption of the *Regional Programme of Action on Protection of the Arctic Marine Environment from Land-based Activities* in 1998, and its updates in 2004 and 2009, PAME outlined a step-wise approach for tackling land-based pollution, which included litter, though there was no specific focus on regional actions to address marine litter until now.

With the completion of the *Desktop Study on Marine Litter, including Microplastics, in the Arctic* (the Desktop Study), which Arctic Council Ministers welcomed in 2019, PAME improved the understanding of the scope of marine litter in the Arctic region, synthesized knowledge on its effects on the Arctic marine environment, and identified knowledge gaps. The Desktop Study sets the framework for this Arctic Regional Action Plan on Marine Litter in the Arctic (ML-RAP).

The Desktop Study demonstrated that marine litter can be found across the Arctic marine environment, including in sea ice, in seafloor sediments, and throughout the water column, as well as on coastlines. The presence of marine litter in the Arctic Ocean is connected to human activities occurring both within and outside the Arctic region.

Marine litter, also known as marine debris, has been defined as “any persistent, manufactured or processed solid material discarded, disposed of,or abandoned in the marine and coastal environment” (UNEP 2009).Examples may include all types of plastic, machined wood, textiles, metal, glass, ceramics, rubber and other persistent man-made material.

Research summarized within the Desktop Study demonstrated that marine litter is transported to and within the Arctic Ocean via ocean currents, freshwater systems, the atmosphere, and other mechanisms such as ballast water, wildlife and accumulation and subsequent transportation in sea ice, released into the ocean as the ice melts. In addition, regional circulation patterns, as well as the drift of sea ice along the Transpolar Drift, can influence the distribution of marine litter in the Arctic.

The Desktop Study considered both land-based and sea-based sources of marine litter. Analysis of existing coastal and seafloor litter data identified fisheries-related activities as a major source of marine litter in the Arctic. Other activities like aquaculture, fishing, cruise tourism, commercial shipping and oil and gas exploration constitute additional sea-based sources. As for land-based sources, waste and wastewater management systems in some coastal Arctic communities were identified as known or potential localized source of marine litter.

A key issue identified within the Desktop Study was the lack of formal and consistent monitoring programs that cover all the sources, pathways, and distribution of marine litter throughout the Arctic and internationally. To address this broad need for monitoring in the Arctic, AMAP and CAFF have developed *Monitoring Guidelines,* as described in further detail in Section 6: Environmental Monitoring.

While the Desktop Study was able to greatly improve an understanding of the state of knowledge on marine litter in the Arctic, it also highlighted key knowledge gaps and future research needs (see Annex 1).

The knowledge on the distribution of marine litter in the Arctic was found to be geographically skewed due to information being most widely available for the Barents, Norwegian and Bering Seas. Comparatively few data points are available for the Central Arctic Ocean and the coastal areas around it in Siberia, Arctic Alaska, mainland Canada, and the Canadian Arctic Archipelago. The research needs highlighted in the Desktop Study fell into broad categories, including the need for information on the distribution of marine litter both among geographic subregions and throughout the marine environment; information on the sources and pathways of marine litter; and information on the impacts of marine litter to Arctic wildlife and human populations.

The information provided in, and gaps identified through, the Desktop Study have contributed to the development of this ML-RAP.  We note the importance of taking action now, based on what we do know, while using the identified gaps and needs to ensure that the actions we take today also serve to improve our collective knowledge in the future.

# 2. Objective

To reduce marine litter in the Arctic marine environment, prevent the potential negative impacts it may have on the marine ecosystems and health and safety, environment, and economies of the people living in the Arctic, as well as on its ecosystems, natural resources, and wildlife, and to improve cooperation and awareness around this shared objective among and between Arctic States, Arctic Indigenous Peoples and local communities and with other States and international bodies outside the region [as appropriate].

# 3. Geographic Scope

This ML-RAP applies to all Arctic marine areas and activities affecting Arctic marine ecosystems, including coastal zones, river basins and other Arctic areas that are connected to the Arctic marine environment. There is no Arctic Council-wide definition of the geographical extent of the Arctic; however, Arctic States define their relevant Arctic areas for each Working Group.

***NOTE: MAP TO BE PROVIDED***

# 4. Marine Litter- A Global Challenge

Marine litter is a global challenge that benefits from action at multiple levels: such as internationally, regionally, nationally and locally. Marine liter found on Arctic beaches, coastlines and in marine waters are found to originate from outside and within the region, with regional variability.

To efficiently prevent marine litter from entering the Arctic environment, litter should be addressed at its source as much as possible. It is a complex problem without one simple fix. Many actions can be taken to tackle marine litter at the local, regional, national and international level, although this ML-RAP is focused on Strategic Actions to be taken in the Arctic.

Global and regional measures and regulations exist for some sources, and there are processes underway that aim to further address marine litter. [~~There is no global overarching framework that covers all sources of marine litter. However,~~ An expert group established under UNEA is to identify existing national, regional and international response options, including their environmental, social, and economic costs and benefits.] Many of the global and regional processes are relevant for the Arctic region, and Arctic States recognize the importance of the international actions and processes in meeting the objective of this ML-RAP. Examples of this type of work include implementation of the IMO action plan against plastic litter from ships, and work at the FAO to address marine litter resulting from fishing activities. [Other entities such as the Basel Convention have taken action as well to work on reducing plastic pollution.] In addition, global coastal cleanup initiatives, and initiatives on prevention of marine litter within other regions and States especially upstreams of the Arctic, are relevant here.

International Cooperation on Marine Litter in the Arctic Context

There are a variety of international measures in the global context, which include both specific marine litter-related commitments for Arctic States and general commitments to prevent pollution, protect the marine environment and protect biodiversity. Work is currently underway on addressing a range of activities in regards to marine litter in both regional and global arenas, such as at the [IMO, FAO, UNEA, Convention on Biological Diversity (CBD), G7/G20, EU, the Nordic Council of Ministers and other entities such the Basel Convention]. In addition, the UN 2030 Agenda on Sustainable Development includes 17 goals, each with specific targets. Specifically, Goal 14 (Life below Water) includes a target to, “by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution.” [In 2017 UNEA adopted a resolution stressing the importance of long term elimination of discharge of litter and microplastics into the oceans (UNEA Resolution 3/7).]

As far back as 1995, more than 100 countries and the European Union supported the non-binding Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA), which addresses eight source categories of pollution, including marine litter, and encourages the development of regional and national program of action. The GPA resulted in the establishment of the Global Partnership on Marine Litter (GPML), in which several of the Arctic States are members of the Steering Committee and the secretariat is hosted by UNEP. The GPML is recognized [by decisions in UNEA] as a platform for voluntary, bottom-up cooperation on the exchange of knowledge and experiences with measures against marine litter. With UNEP, IMO, FAO and the Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) on the steering committee, the GPML is unique and relevant for the ML-RAP. [GESAMP is developing a global peer-reviewed aseessment on seabased sources of marine litter.]

The UNEP Regional Seas Programme has been an integral part of ocean governance since its establishment in 1974. There are 18 regional seas programs around the world of which seven are administered by UNEP. Many of the regional seas programs have developed action plans to address marine litter and marine pollution. In general, such plans identify actions such as minimizing inputs from sea-based and land-based sources of marine litter; promoting actions to remove existing litter from the marine environment; supporting education and outreach efforts to increase public awareness, promote better commercial and recreational fishing practices, and promote collaboration among governments, private industry, and non-governmental organizations; and identifying ways to monitor and assess the marine environment and the efficacy of these actions to minimize impacts from marine litter. Some of the plans contain specific actions to be accomplished within set timelines.

Regional Seas Conventions with a regional Action Plan action plan on marine litter covering parts of the Arctic includes the OSPAR Convention on the Protection of the marine environment in the North-East Atlantic.

Regional Fisheries Management Organisations often also have regulations contributing to reducing marine litter, through prevention and reporting of loss of fishing gear, implenting FAO guidelines. RFMOs covering parts of the Arctic includes the North-East Atlantic Fisheries Commission, NEAFC, which has such regulations.

In addition to the primary purpose of Arctic States taking action nationally and collectively in the Arctic, this ML-RAP for the Arctic provides an opportunity for Arctic States to cooperate to promote specific actions in relevant international and regional fora [as appropriate.]

***SOURCES OF MARINE LITTER***

***Sea-based:*** *The major sectors of maritime activity in the Arctic region that have been identified as potential sources are fisheries (including commercial, subsistence, and recreational), aquaculture, shipping, and cruise tourism. One emerging sector of activity that may also need consideration is offshore resource exploration and exploitation as chemicals used in the industry [may contain microplastics , which will be released to the marine environment during production]/[and potential discharge of plastics], [including the use and potential discharge of plastic materials contained in offshore chemicals] (Moskeland et al., 2018).*

***Land-based:*** *At the global level, much of the input of litter and waste from land into the ocean is a result of inadequate waste and wastewater management in coastal regions with high and growing population densities (Jambeck et al., 2015). Although pollution densities in Arctic coastal areas are low, which should mean reduced pressure from land-based sources, there are characteristics unique to the region, such as population concentration along the coastline and river courses; settlements not covered by any waste collection schemes; remoteness, lack of connection with any network of large (regional or national) waste management systems; and lack of or deficient local waste management systems, which may lead to locally high inputs linked to industrial or domestic waste management.*

# 5. Actions for the prevention and reduction of Arctic marine litter

Marine litter represents a serious environmental problem in the Arctic, this ML-RAP sets out a range of actions that can be undertaken by the Arctic Council and its subsidiary bodies, in collaboration with Observers of the Arctic Council and other partners, as appropriate. There is also an opportunity for collaboration among the Arctic states to promote these actions in relevant international and regional fora.

The actions are intended to address the most prevalent regional sources of marine litter and the marine litter types posing the highest environmental risks, as well as identify the areas of highest accumulation due to Arctic-specific pathways and the regions most impacted by marine litter.

The actions are based on best available knowledge, guided by information and identified knowledge gaps identified from the Desktop Study and other relevant initiatives across the Arctic Council and its subsidiary bodies. The overarching aim is to reduce marine litter entering and remaining in the Arctic marine environment in order to alleviate the damage it causes.

This ML-RAP covers a range of Strategic Actions to address marine litter in the Arctic region organized by themes, followed by research actions, outreach actions and actions that can further international cooperation. This is not an exhaustive list of actions. It is anticipated that additional actions may be required as new priorities emerge or new information becomes available through, for example, ongoing or new studies by the Arctic Council working groups and others

Implementation will play an important role in demonstrating Arctic States’ stewardship efforts to reduce negative impacts of marine litter on Arctic marine species and ecosystems as well as communities.

*Note: Additional description to be provided reflecting the various stakeholders being targeted or consulted (e.g. indigenous and local communities, private sector, youth, industry, etc.). Also, it will reference the importance of using scientific knowledge and traditional and local knowledge. These concepts will be applicable to the actions as a whole rather than trying to target in each action which becomes cumbersome.*

## I) Reducing Inputs from Fisheries and Aquaculture

Fisheries and aquaculture activities take place in the marine environment and both, in different ways have the potential to be direct sources of marine litter. Analysis of existing coastal and seafloor litter in some regions of the Arctic identified all types of fishing activities as a significant source of marine litter. While the aquaculture sectors contribution to marine litter in the Arctic is potentially relatively small compared to the fisheries sector, it has the potential, on a local scale, to contribute to marine litter in the Arctic marine environment. [Actions to reduce input from fisheries and aquaculture activities will take into consideration and contribute to existing initiatives and processes on regional and global arenas, such as at the GGGI, FAO and IMO.]

**Actions**

1. Review and promote best practices for waste [prevention], management and disposal procedures for waste generated by fishing vessels and aquaculture installations in the Arctic that complement onshore waste management practices. This includes all relevant aspects of waste prevention and management such as source reduction, alternative materials, port reception facilities, reuse, recycling and recovery, operational losses/net cuttings and waste management on board vessels and at aquaculture installations, and litter collected from the sea during fishing.
2. Enhance awareness of threats that abandoned, lost or otherwise discarded fishing gear (ALDFG) pose to marine environment and safety.
3. Support and promote gear marking, reporting and recovery of ALDFG, as outlined in the FAO "Voluntary Guidelines for the Marking of Fishing Gear, and identify most commonly lost or discharged fishing gear in the Arctic.
4. [Assess possibilities and develop procedures for preventing losses and discharges of fishing gear in the Arctic.]
5. [Support FAO work to assess possibilities for preventing losses and discharges of fishing gear in the Arctic.]

[5 Alt: Assess possibilities and develop procedures for preventing losses and discharges of fishing gear in the Arctic.]

1. Identify hot spot areas of ALDFG in the Arctic through mapping of known snagging sites or dumping grounds, in collaboration with relevant stakeholders, such as ﬁshing organisations, research programmes, and other initiatives .
2. Develop a risk assessment to identify where accumulations of ALDFG pose a threat to the environment and should be removed.
3. Identify retrieval practices for ALDFG that are environmentally sound to the marine environment.
4. Contribute to and support the implementation of the IMO Action Plan to address marine plastic litter from ships, focused on measures on ALDFG.
5. Support and promote reporting and recovery, where practicable, of lost items and gear from aquaculture.
6. [Encourage States, in compliance with MARPOL V, to ban the discard of fishing gear in the environment and the reporting of loss of fishing gear in national regulations and regional fisheries management organizations to which they are a member.]

## II) Improving Management of Waste and Wastewater Generated by Ships and Offshore Structures

Ships of all sizes and types ~~[from cargo vessels, to cruise ships and small pleasure craft~~] are potential sources for marine litter. The release of garbage and other materials from ships is regulated through the IMO, under the International Convention for the Prevention of Pollution from Ships, known as MARPOL Unless expressly provided otherwise, MARPOL Annex V applies to all garbage produced by ships operating in the marine environment, from commercial cargo vessels to fixed or floating platforms, and non-commercial ships like pleasure crafts and yachts. The way in which vessels treat sewage, garbage, other waste and greywater, either at sea or in port, can result in the release of litter into the marine environment.

**Actions**

1. Characterize waste generated by ships and offshore structures and assess gaps and opportunities to improve waste minimization at the source; [where appropriate,] collection at marinas, harbors, ports, and terminals; and recycling in alignment with local waste management facilities and practices that contribute to the minimization of marine litter
2. Analyze waste collection, sorting and classification methods used within the Arctic at on-shore collection sites and identify recycling, reuse, waste to energy and other programs in alignment with local waste management facilities and practices. and explore opportunities for expanding these programs.
3. Identify and promote Arctic-relevant best practices and guidelines to improve environmentally sound management of MARPOL regulated waste generated by ships and offshore structures.
4. Encourage Arctic states to enhance inspection and enforcement on ships, offshore structures and at ports and terminals for compliance with MARPOL Annex V, which includes providing adequate facilities for the reception of garbage
5. Promote and incorporate, when relevant to Arctic waters and Arctic States, the International Standard Organization’s (ISO) existing related standards developed to provide methods for addressing the management and handling of ship-generated waste.
6. Review the IMO’s annual reports on alleged inadequate port reception facilities and implement, where possible and practicable, solutions to address inadequacies and trends found in Arctic and non-Arctic ports used by vessels operating in or transiting through Arctic waters.
7. Continue supporting ongoing contributions to the IMO by Arctic States to include Arctic-specific amendments to MARPOL to allow for regional arrangements of port reception facilities
8. Encourage Arctic States participating in regional arrangements to then develop a Regional Reception Facilities Plan for IMO approval and Arctic State implementation, which includes collection and assessment of data regarding ship waste and use of port reception facilities in the Arctic.
9. Support/encourage the use of existing best practice/site-specific guidelines and the development of new ones, as relevant, for near-shore and coastal areas of the Arctic visited by passengers of marine tourism vessels and pleasure crafts.
10. Contribute to and support the implementation of the IMO Action Plan to address marine plastic litter from ships, focusing on the effectiveness of port reception facilities and treatment in reducing marine plastic litter.

## III) Improving Onshore Waste and Wastewater Management

The conditions for waste and wastewater management vary throughout the circumpolar Arctic, some regions with advanced systems, and some communities with little or no infrastructure. There are unique characteristics across remote communities in Arctic coastal regions, including low population densities, variable concentration of communities along coastlines and rivers, and a general lack of infrastructure for local waste collection. These characteristics mean that there may be instances of locally high inputs of litter into the marine environment due to the challenges and cost of removal.

**Actions**

1. Develop best practices and guidelines to improve the waste management systems in Arctic areas at the appropriate levels of jurisdiction. This could include facilitating increased waste collection and appropriate processing, highlighting infrastructure challenges in the Arctic, addressing waste leakage issues associated with unregulated open solid waste dumpsites, strengthening end-markets for reuse and recyclable materials, and improving sustainable management of solid waste, especially in remote Arctic areas.
2. Share and promote best practices to prevent marine litter from entering the marine environment through sewage, stormwater and wastewater outlets, where such infrastructure exists or is feasible.
3. Assist remote Arctic communities with developing training and technical materials to improve pollution prevention and the collection and sustainable management of [solid] waste and wastewater, including considering pathways for transport/backhaul of waste out of remote communities to processing facilities.
4. Identify source areas of litter in upstream regions of the rivers that flow into the Arctic and reduce the input from these potential point and non-point-sources to the Arctic. This could include enhanced cooperation with river basin authorities.
5. Identify landfills and dumpsites tonear Arctic coastal zones and waterways, particularly those at greatest risk of and/or already being affected by coastal erosion, permafrost thaw, increased leakage, and natural disasters.
6. Review best practices for remedial action to prevent unintentional release of waste into the marine environment from affected or susceptible landfill and waste sites and engage Indigenous and local communities in the process of developing guidelines to clean up and restore affected areas in the most cost effective way at the appropriate levels of jurisdiction.

## IV) Sustainable Materials in the Arctic Environment

While prevention of litter from entering the marine environment should be a priority, it is also important to consider the potential sources of litter and what materials are entering the region. Arctic States can seek innovative solutions to the reuse, recycling, and redesign of materials used in the region

**Actions**

1. Engage stakeholders to identify the types of sustainable products and services needed to reduce waste and to recover the value that might otherwise be wasted in the Arctic.
2. Develop and share, in accordance with national circumstances, best practices, measures, and tools, including incentives, that will result in the reduction, reuse, repair, remanufacture, and recycling of waste items, focusing on those most commonly found as marine litter in the Arctic.
3. Identify and share information on the availability and use of [sustainable alternatives to products that can contribute to][appropriate products that can contribute to reducing] marine litter in the Arctic.
4. Promote initiatives, tools and guidance that inform households, youth, schools, businesses, and institutions to facilitate positive behavior and reduce waste and marine litter in the Arctic.
5. [Promote the development and design of environmentally friendly alternative materials for use in fishing gear that will be more easily recycled]
6. [Promote the use of incentives, as appropriate within national programs, to specifically target the reduction of use of monofilament fishing gear by industry.] [Note: the inclusion of this Strategic Action is still under discussion.]

## V) Cleaning Arctic Coasts

[Economic costs of cleaning Arctic shores is normally borne by the public sector, civil society, and individual citizens. There exist significant opportunities to develop a more comprehensive understanding of how to most efficiently and safely undertake shoreline cleanup activities related to key litter categories. These include actions that use remote sensing to identify areas of significant litter accumulation to aid in coastal clean-ups organized at different scales, frequency, and capacity across the Arctic.]

**Actions**

1. Share experiences in implementing national- and other relevant programmes for environmentally sound removal and disposal of marine litter from shorelines, waterways and nearshore areas in the Arctic including opportunities to recover the materials through reuse and recycling of the litter.
2. Share experiences and promote national regulations and other approaches to prevent, identify, prioritize, and remove abandoned derelict vessels (ADVs) in the Arctic, particularly in ecologically sensitive and culturally important areas.
3. Promote best practices for the removal, reuse and recycling of marine litter along Arctic shorelines, waterways, and nearshore areas. This includes efforts that: minimize adverse environmental effects; include participation of citizens regarding reporting and clean-up activities; promote safety; assess logistical feasibility of removal in Arctic remote communities, and; promotes integration of information on litter accumulation locations and patterns.
4. Involve Indigenous Peoples, and local communities, youth and young adults in clean-up actions and marine litter recycling actions which promote the reduction of litter.

## VI) Strengthening monitoring and research

Current knowledge of Arctic marine ecosystems differs throughout the circumpolar Arctic and a number of research initiatives and organizations are active in the region. Arctic States, the Arctic Council and relevant research organizations and entities may already be or can look to conduct or support research on marine litter in the Arctic environment, focusing on its interactions with fisheries and wildlife, and implications for Arctic communities. The inclusion of traditional and local knowledge is vital for exploring solutions to emerging issues in the Arctic, and contributing to the best available knowledge base for decision-making. There are a number of resources within the Arctic Council in relation to coordination of monitoring, priorities and best practices within the region. These include the AMAP Monitoring Plan and Marine Litter Monitoring Guidelines (see section 6) and CAFF Circumpolar Biodiversity Monitoring Program (CBMP)in addition to more specific projects such as one focusing on seabird exposure and vulnerability to plastic pollution (CAFF reference once complete). This can provide a basis for future coordination on research and monitoring efforts, and enable data outcomes that are more easily comparable across different programs.

**Actions**

1. Prioritize monitoring, research and investments in Arctic science and integration of knowledge Traditional and Local Knowledge on the presence, movement, composition, and impacts of marine litter in the environment.
2. Promote harmonized approaches to detect, monitor, characterize and assess marine litter in the Arctic environment applying current state-of-knowledge.
3. Encourage the collection and sharing of data on litter quantity and composition from removal and clean-up activities, integrating community engagement and citizen science.
4. Improve understanding and modeling of the sources, sinks, movement, and distribution of marine litter in the Arctic, including pathways into the Arctic , to help identify and prioritize Arctic hotspots and other key geographic areas of concern.
5. Work to identify and understand the potential impacts of marine litter on the environment and wildlife species of ecological, commercial, and cultural importance (e.g., marine mammals, fish, and seabird) in the Arctic, including entanglement ingestion and potential contaminant transfer from marine litter to wildlife.
6. Work to identify and understand the potential impacts of marine litter on human health and implications for Arctic communities, including potential ingestion of microplastics transferred through the food chain.
7. Promote and support research to identify the existing and potential socio-economic impacts of marine litter in the Arctic, in both private and public sectors and at cultural, community, and regional levels.
8. Work to advance research on technologies and innovations for the environmentally sound removal of marine litter taking into account the unique conditions of the Arctic.
9. Support research on generation and spread of microplastics from wear and tear of plastic gear from fisheries and aquaculture.

## VII) Outreach

Outreach and education activities, targeted at and tailored to specific audiences, including different levels of government, Indigenous Peoples, the fisheries and aquaculture, shipping, and tourism industries, educators and youth, and the general public are key to achieving a reduction of marine litter at its sources, both within and outside the region. Communicating information and best practices on how to reduce, reuse or recycle waste before it becomes marine litter and the impact on wildlife and communities can contribute to [responsible] [positive] action by individuals and sectors. Communicating information on current research outcomes in the Arctic will also be important. In the Arctic context, working with Indigenous Peoples and local communities to increase their awareness about marine litter, leveraging traditional and local knowledge, and incorporating local circumstances and cultural considerations will be important when undertaking outreach and education.

**Actions**

1. Increase awareness of updated information and best practices relevant to MARPOL Annex V measures by vessel operators that Arctic States´ ports.
2. Increase awareness, including the development and distribution of educational material, across Arctic communities and commercial, subsistence, and recreational vessel operators, commercial and subsistence fishermen, and operators of offshore structures on best waste management practices that reduce their sector’s contribution to marine litter [and increase their contribution to a [circular economy]/[resource efficiency] through reuse, recycling and recovery of waste].
3. Raise vessel owners' awareness of the financial and environmental costs of ADVs and of options and procedures for responsible disposal of vessels to prevent the improper vessel disposal.
4. Identify, share, and promote Arctic-relevant best practices, research and funding opportunities to reduce waste and marine litter.
5. Support or promote curricula for marine-related education, including professional seafarers, the aquaculture industry, fisheries and the recreational sector (e.g. diving and sailing schools), to develop awareness, understanding, and respect for the marine environment and foster responsible behavior.
6. Support and collaborate with youth organizations to facilitate intergenerational dialogue on marine litter and encourage positive action.
7. Conduct outreach and communication with fishing organizations and the aquaculture industry on the types of gear typically found in Arctic coastal clean- ups to improve understanding of gear lost and promote good practices.
8. Identify successful anti-littering campaigns and re-design them for promotion within Indigneous and local communities in the Arctic, with community and youth involvement and incorporating local circumstances, cultural considerations, and methods to leverage traditional and local knowledge and engagement to prevent future introduction and impact.
9. Host or participate in conferences, symposia or online events on marine litter in the Arctic, focusing on the latest scientific and traditional and local knowledge and best practices.

## VIII) International Cooperation

The Arctic marine environment is part of the overall global oceans system. Current negative trends in the Arctic could have lasting effects which will continue on through future generations. There are a number of international organizations that work on marine litter issues, such as IMO and FAO in the shipping and fisheries realms. Cooperation with these bodies enables Arctic states to advance the policies, guidelines, and tools developed by these organizations and to share information on lessons learned. [In order to achieve reduction in the occurrence of marine litter in the Arctic region, cross-sectoral and inter jurisdictional cooperation will be needed.]

[There are a number of international organizations that work on marine litter issues, such as IMO and FAO in the shipping and fisheries realms. Cooperation with these bodies enables Arctic states to advance the policies, guidelines, and tools developed by these organizations and to share information on lessons learned.]

**Actions**

1. Facilitate communication and information exchange with regional seas programs and other relevant fora, for sharing experiences on the development of best practices and the use of environmentally sound technologies for removal of marine litter, including by Indigeous and local communities.
2. [Cooperate and coordinate with global marine initiatives such as UNEP’s Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPAMarine); the Regional Seas Action Plans; The Global Partnership on Waste Management (GPWM); and Global Ghost Gear Initiative (GGGI).]

[57 Alt: Cooperate and coordinate with relevant international organizations, non-profits, and the private sector on international initiatives that address prevention, reduction, and removal of marine litter.]

[Promote and support the establishment of a global process for development of a global overarching agreement(framework) that covers  all sources of marine plastic litter, and that strenghtens coordination and cooperation between states, relevant institutions and instruments.]

1. Encourage international organizations and Arctic States to share scientific research monitoring activities relevant to marine litter in the Arctic in a timely manner to enable decision-making based on the best available scientific information.
2. Participate in international conferences, symposiums or online events on marine litter issues to highlight the work on and management of marine litter in the Arctic and the interlinkages of marine litter to other regions.

# 6. Environmental Monitoring

Long-term harmonized monitoring is essential for tracking trends of marine litter across space and time. For example, seabirds have been used to understand trends of marine litter across the north Atlantic (Provencher et al., 2017), as well as in the North Sea over time (van Franeker et al., 2011). In addition, protocols applied at international, regional, and national scales have facilitated marine litter monitoring on Arctic shorelines and beaches, with the purpose of spatial and temporal assessments, identification of sources, and in some instances, an eye toward evaluations of pollution-preventing measures.

In general, Arctic environmental conditions present challenges to monitoring, resulting in few monitoring initiatives and limited data for marine litter across the Arctic. While some monitoring information is available for marine litter in seabirds and on shorelines in specific areas or from specific studies, as mentioned above, very little information is available about marine litter broadly or in other environmental compartments. Where data is available, the lack of common methods and harmonized reporting make it difficult to compare information across studies or campaigns.

It is important for the implementation and success of the ML-RAP to be able to track changes in marine litter prevalence and better understand marine litter sources, as well as impacts on communities, wildlife, and the broader ecosystem. Given the pan-Arctic nature of the ML-RAP, monitoring marine litter across space and time will need to employ a variety of tools to track trends across a range of scales. To address this broad need for monitoring, the Arctic Council has developed a monitoring plan and monitoring guidelines (AMAP reference once complete) providing region-specific recommendations and methods on monitoring marine litter, in addition to more specific projects such as one focusing on seabird exposure and vulnerability to plastic pollution (CAFF reference once complete). Furthermore, satellite remote sensing has the potential to supplement tracking efforts and identify hotspots of accumulation.

The goal of Arctic Council marine litter monitoring efforts is to promote harmonized methods for monitoring and reporting on volumes and characteristics of marine litter throughout the Arctic marine environment. While the monitoring plangives overall recommendations on the design of the monitoring program, the monitoring guidelines are detailed technical documents that cover methods for examining marine litter in the Arctic environment by compartment. It includes several marine compartments: seawater, marine sediments, the seabed, shorelines, and marine biota (invertebrates, fish, birds, and mammals). However, the monitoring guidelines are not limited to the marine environment and also provide guidance on monitoring of the atmosphere, freshwater, terrestrial soil, ice and snow. The monitoring guidelines also include the technical information for sampling each compartment, processing the samples, and reporting results, in addition to recommendations for quality assurance/quality control measures. It is critical that the methods used result in comparable data across regions in the world, [in particular with data produced from monitoring programs under other regional action plans covering parts of the Arctic].

# 7. Implementation

The ML-RAP addresses both short-term and long-term challenges and opportunities to reduce and eliminate marine litter from both sea-based and land-based sources in the Arctic region. The Arctic Council working groups will coordinate and cooperate closely to facilitate and support the actions listed in the ML-RAP. In addition, the Arctic Council will need to look to individual Arctic States for support and participation. Working regionally offers an economy of scale, particularly for such joint efforts as research, monitoring, and technical cooperation. It can also improve policy and program coordination, which in turn also help implementation. The implementation of this ML-RAP may also foster Arctic States cooperation to promote Arctic initiatives in other relevant international and regional fora, [as appropriate].

The Arctic Council provides strong institutional support for the stewardship of the Arctic marine environment. The implementation of this ML-RAP relies on the existing structures and mechanisms of the Council, i.e., Arctic Council biannual meetings, Senior Arctic Official (SAO) meetings and the activities of the Arctic Council working groups. Each working group, under the overall direction of the SAOs, implements, subject to available resources, those actions that relate to their mandate and incorporates them into their work plans by consensus. As a part of the marine litter found in the Arctic comes from outside of the region, cooperation and collaboration between Arctic States, Permanent Participants, Observer States and international organisations, as well as other countries can contribute to reducing marine litter in the Arctic.

Reports on the implementation of the ML-RAPwill be submitted bienniallyto the SAOs. PAME, in collaboration with all Arctic Council subsidiary bodies, will lead a review and period update of the ML-RAP.

Under the direction of SAOs, PAME will, in consultation with other Arctic Council Working Groups and Permanent Participants, develop a Communication Plan to raise awareness of the ML-RAP in support of its implementation.

# References

***Note: to be populated***

# List of Acronyms

***Note: to be populated and verified***

GGGI - Global Ghost Gear Initiative

ALDFG - abandoned, lost or otherwise discarded fishing gear

MARPOL - International Convention for the Prevention of Pollution from Ships/ Maritime Pollution

IMO – International Maritime Organization

FAO – Food and Agriculture Organization

EU – European Union

GISIS – Global Integrated Shipping Information System (I wrote this out with the abbreviation on page 12 of the RAP)

ISO – International Organization for Standardization

LCA – life cycle assessments

KIMO - Kommunenes Internasjonale Miljøorganisasjon

NABU - Nature and Biodiversity Conservation Union

NEAFC - North East Atlantic Fisheries CommissionMOOC – Massive Open Online Courses – (on page 28 of the RAP)

OSPAR -  [Convention for the Protection of the Marine Environment of the North-East Atlantic](http://www.ospar.org/site/assets/files/1290/ospar_convention_e_updated_text_in_2007_no_revs.pdf)

[UNEA - United Nations Environment Assembly]

# Annex 1: Selected Research Needs based on the Desktop Study on Marine Litter.

* information on the distribution of marine litter geographically and physically (e.g. on shorelines and in the water column, sea floor, sea ice);
* information on the sources and pathways of marine litter; and,
* information on the impacts of marine litter and potentially associated contaminants to Arctic wildlife and human populations.

***Note: Table to be included***

1. Arctic Council (2019). “Statement by the Chair; 11th Ministerial Meeting of the Arctic Council.” Rovaniemi, Finland. Accessed at: <https://arctic-council.org/images/PDF_attachments/Rovaniemi-Statement-from-the-chair_FINAL_840AM-7MAY.pdf>. [↑](#footnote-ref-2)