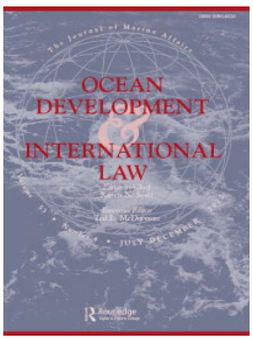

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Waste Management on Fishing Vessels and in Fishing Harbors in the Barents Sea: Gaps in Law, Implementation and Practice

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ABSTRACT

This article aims to map and provide an overview of international, regional, and national law applicable to marine waste in the Barents Sea, and to analyze fishing industry actors' practices and perceptions of marine waste. We identify gaps between the law and its implementation, enforcement, and practice. The legal framework for marine plastic pollution in the Barents Sea and the Arctic is fragmented and not harmonized. Insufficient waste management facilities and regulations are likely to hinder compliance with existing regulations. There is an urgent need to upgrade the waste management infrastructure for the fishing industry in Norway and in northwest Russia.

KEYWORDS

Barents Sea; compliance; enforcement; fishing industry; marine plastic litter; northwest Russia; Norway; waste management

Introduction

Known as an environmental problem since at least the 1990s, marine plastic pollution has become a widely discussed global problem in recent decades.[1] The enormous amount of litter in the oceans poses a risk to animal welfare and has adverse ecological consequences, the scope and effects of which are being investigated by different disciplines. Scientific knowledge about the accumulation of microplastics in food chains and the lethal effects of plastic pollution on marine life is growing. The negative impact on ecosystem services is a threat to people's well-being, society, and economy.[2] The

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[1] Ljubomir Jeftic, Seba Sheavly, and Ellik Adler, "Marine Litter a Global Challenge," United Nations Environment Programme (UNEP) ,(Nairobi, 2009), at: https://wedocs.unep.org/handle/20.500.11822/7787 (accessed 20 June 2018); United Nations Environment Programme (UNEP), "Marine Plastic Debris and Microplastics—Global Lessons and Research to Inspire Action and Guide Policy Change," United Nations Environment Programme (Nairobi, 2016), at: https://wedocs.unep.org/handle/20.500.11822/7720 (accessed 20 June 2018).

[2] Nicola J. Beaumont, Margrethe Aanesen, Melanie C. Austen et al., "Global Ecological, Social and Economic Impacts of Marine Plastic" (2019) 142 *Mar Pollut Bull* 189.

This article has been corrected with minor changes. These changes do not impact the academic content of the article.

ecological impact of pollution threatens Earth's biophysical capacity to support modern world development.[3]

The fishing industry makes a significant contribution to the marine litter problem.[4] This article addresses marine plastic waste from fishing vessels. In line with Olsen et al.,[5] we acknowledge the complexity of the two terms "waste" and "litter." In our study, waste is defined as waste generated onboard a vessel, as well as fishing gear discarded and lost during fishing activities. Such waste encountered in the marine environments is often referred to as marine litter. Marine litter is defined by the United Nations Environment Programme (UNEP) as "any persistent manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment."[6]

Waste and litter channeled back into the economy can become a resource within the economic system again.[7] This is a guiding principle in the transfer from a linear to a circular economy, which prescribes first reducing the generation of waste, then reusing, repairing, and recycling the waste into new production. The options of last resort in a circular value chain are incineration and placement in a landfill.[8]

When waste is poorly managed, not accounted for, and disappears, it becomes litter. An estimated eight million metric tons of plastic waste enters the oceans every year, becoming litter, a volume projected to double by 2030 and double again by 2050.[9] Estimates suggest that more than 150 million metric tons of plastics have accumulated in the world's oceans.[10] Although removing plastic litter in the oceans and processing it on shore is possible, it is intensive, expensive, and inefficient.[11] Removing plastic debris from the ocean may cause more harm to the marine ecosystem, as any technology to remove target plastics in the ocean also interacts with marine life and habitats, thus risking harmful ecological impacts, such as by-catch and

[3] Johan Rockström, W. L. Steffen, Kevin Noone, et al., "Planetary Boundaries: Exploring the Safe Operating Space for Humanity" (2009) 14 *Ecology and Society* 1; Will Steffen, Katherine Richardson, Johan Rockstrom, et al., "Sustainability. Planetary Boundaries: Guiding Human Development on a Changing Planet" (2015) 347 *Science* 736; Miriam L. Diamond, Cynthia A. De Wit, Sverker Molander, et al., "Exploring the Planetary Boundary for Chemical Pollution" (2015) 78 *Environment International* 8.

[4] United Nations Environment Programme (UNEP) and GRID-Arendal, *Marine Litter Vital Graphics*, United Nations Environment Programme and GRID-Arendal (Nairobi and Arendal, 2016) at: https://www.grida.no/publications/60 (accessed 20 June 2018).

[5] Julia Olsen, Leticia Antunes Nogueira, Anne Katrine Normann, et al., "Marine litter: Institutionalization of attitudes and practices among Fishers in Northern Norway" (2020) 121 *Marine Policy* 104211.

[6] United Nation Development Program (UNEP), "Marine Litter: The Issue" (2019) at: https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/marine-litter-issue (accessed 26 January 2020).

[7] Jouni Korhonen, Antero Honkasalo, and Jyri Seppälä, "Circular Economy: The Concept and Its Limitations" (2018) 143 *Ecological Economics* 37; Heidi Rapp Nilsen, "The Hierarchy of Resource Use for a Sustainable Circular Economy" (2019) 47 *International Journal of Social Economics* 27.

[8] European Commission, *Closing the Loop—An EU Action Plan for the Circular Economy. Communication From the Commission to the European Parliament,The Council, the European Economic and Social Committee and the Committee of the Regions* (2015); Mangesh Gharfalkar, Richard Court, Callum Campbell, et al., "Analysis of Waste Hierarchy in the European Waste Directive 2008/98/EC" (2015) 39 *Waste Management* 305; Nilsen, note 7, 34.

[9] Ellen McArthur Foundation, *The New Plastics Economy. Rethinking the Future of Plastics.*, Ellen McArthur Foundation, (2016) at: https://ellenmacarthurfoundation.org/the-new-plastics-economy-rethinking-the-future-of-plastics (accessed 20 June 2018).

[10] United Nations Environment Programme (UNEP) and GRID-Arendal, note 4, 40; Oliver Tickell, *International Law and Marine Plastic Pollution—Holding Offenders Accountable* (Arctic project, 2018) at: http://apeuk.org/wp-content/uploads/2018/02/OPLI-online-final.pdf (accessed 3 March 2020).

[11] Beaumont, Aanesen, Austen, et al., note 2, 189.

habitat destruction.[12] Preventing plastics from entering the oceans depends on having an appropriate legal framework, its implementation and enforcement, waste management practices, and, equally importantly, attitudes and behaviors determining whether individuals and companies comply with legislation supporting nonpolluting practices. Preventing plastics entering the oceans in the first place is a precondition for shifting from linear to circular economic principles.[13]

The Barents Sea is one of the least polluted wilderness areas, with few local sources of anthropogenic pollution owing to limited human presence.[14] Owing to low temperatures and low biological activity, pollutants from lower latitudes are released in or transported to the Barents Sea and persist there for a long time.[15] The Arctic is particularly vulnerable to marine pollution, as persistent pollutants such as plastics are easily transported to the upper latitudes by wind and ocean currents.

The fishing industry makes a significant contribution to littering in the Barents Sea, as it does worldwide.[16] The proportion of fishing gear in marine litter is greater in the Arctic than in other parts of the world.[17] It follows that action by the fishing industry is key to approaching the problem and finding solutions to reduce marine litter, which is why we have investigated the knowledge, attitudes, and practices among fishing industry actors in this article.

In northern Norway, fishing activity is high and ocean currents bring litter, including fishing gear, to the Arctic from other marine areas.[18] Large amounts of lost or abandoned fishing gear are collected every year by the Norwegian Directorate of Fisheries. In 2020, 2400 crab traps abandoned on the sea bottom were collected in the Barents Sea.[19] In 2018, more than 8000 traps were collected.[20] Furthermore, marine plastic litter in the Arctic comes from inland areas through rivers, from adjacent seas such as the

[12] Jannike Falk-Andersson, Marthe Larsen Haarr, and Vilma Havas, "Basic Principles for Development and Implementation of Plastic Clean-Up Technologies: What Can We Learn From Fisheries Management?" (2020) 745 *Sci Total Environ* 141117.

[13] Nilsen, note 7, 33; European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A New Circular Economy Action Plan For a Cleaner and More Competitive Europe COM/2020/98 Final,* European Commission, (Brussels, 2020) at: https://www.eea.europa.eu/policy-documents/com-2020-98-final-a (accessed 20 February 2021).

[14] Tenaw G. Abate, Tobias Börger, Margrethe Aanesen, et al., "Valuation of Marine Plastic Pollution in the European Arctic: Applying an Integrated Choice and Latent Variable Model to Contingent Valuation" (2020) 169 *Ecological Economics* 106521; Benjamin S. Halpern, Shaun Walbridge, Kimberly A. Selkoe, et al., "A Global Map of Human Impact on Marine Ecosystems" (2008) 319 *Science* 948.

[15] Arctic Monitoring and Assessment Programme (AMAP), *Human Health in the Arctic* (Arctic Council, Oslo, 2015) at: https://www.amap.no/documents/doc/amap-assessment-2015-human-health-in-the-arctic/1346 (accessed 20 June 2018).

[16] Benedikte Farstad Nashoug, *MARine Plastic Pollution in the Arctic: Origin, Status, Costs and Incentives for Prevention. Report on WP 1.2 "Sources of Marine Litter" Workshop on Svalbard 4th–6th September 2016* (SALT, 2017) at: https://pame.is/document-library/desktop-study-on-marine-litter-library/marine-litter-sources/577-nashoug-2017-sources-of-marine-litter-worksh/file (accessed 2 January 2018); United Nations Environment Programme (UNEP) and GRID-Arendal, note 4, 27.

[17] Oda Mulelid, "A Deep Dive Into Marine Litter," GRID-Arendal (2022) at: https://news.grida.no/a-deep-dive-into-marine-litter (accessed 12 October 2022).

[18] Marthe Larsen Haarr and Jannike Falk-Andersson, HAVPLAST—delrapport marin plastforsøpling fra fiskeflåten/Ocean Plastics—Report on Marine Plastic Pollution from the Fishing Fleet (SALT, 2019) at: https://salt.nu/prosjekter/havplast-delrapport-marin-plastforsopling-fra-fiskeflaten (accessed 2 January 2020).

[19] Torkild Emberland, "Avslørte dyretragedie på havets bunn—fant 2.400 forlatte teiner/Discovered Animal Tragedy at the Sea Bottom—Found 2,400 Abandoned Pots" 31 August 2020 *iFinnmark* at: https://www.ifinnmark.no/avslorte-dyretragedie-pa-havets-bunn-fant-2-400-forlatte-teiner/s/5-81-1223058 (accessed 1 September 2020).

[20] Fiskebåt, "8600 spøkelsesteiner er fjernet/8,600 Ghost Pots Have Been Removed" 26 June 2018 at: https://fiskebat.no/nyheter/8-600-spokelses-teiner-er-fjernet (accessed 30 June 2018).

Atlantic and the Pacific Oceans, and from remote areas through the global oceanic circulation.[21]

The Arctic Council has addressed the problem of marine litter at the circumpolar level since 1998, when the ministers from the Arctic states adopted the Regional Programme of Action (RPA) for the Protection of the Arctic Marine Environment from Land-based Activities.[22] Concerted international effort is required in order to agree on a legally binding framework with comprehensive, international regulatory mechanisms to prevent and remediate marine plastic pollution in the Arctic. However, regional action, while important, is also limited in that much of the Arctic Ocean lies beyond national jurisdiction and is a victim of the uncoordinated efforts globally to curb plastic pollution. Importantly, we argue that at both regional and international levels any solution-oriented approach to waste management would benefit from insights into knowledge, attitudes, and practices among fishing industry actors.

This article aims to map and provide an overview of the law at international, regional, and national levels, applicable to marine waste in the Barents Sea. It also aims to provide empirical information on the attitudes and experiences of local fishing actors with respect to marine waste from fishing vessels. To this end, we conducted a survey of fishing industry actors in Norway and northwest Russia operating in the Barents Sea in 2017–2018. Based on the survey results, we analyzed the extent of gaps between legislation regulating waste facilities on board fishing vessels and in harbors, and the implementation, enforcement, and practice of the legislation in Norway and northwest Russia.

We posed the following research questions:

1. What are the applicable laws in Norway and northwest Russia regarding waste management on fishing vessels and in fishing harbors in the Barents Sea area?
2. Is there a gap between laws and regulations and fishing industry actors' compliance?
3. If there is a gap, what are the reasons for this, as perceived by the respondents in our survey?

To answer these research questions, our study was conducted by an interdisciplinary research team drawn from the fields of law, economics, and human geography.

This is not a comparative study between the two countries. While there are large differences between Norway and northwest Russia with respect to law, policy, management, culture, behavior, and fishery-related factors, such as fleet structure and use of fishing gear, our survey rendered limited opportunities for a comparison. Instead, we used the results to map the relevant legislation and examine how the process of reducing marine litter in the Barents Sea could be improved.

[21] Protection of the Marine Arctic Environment (PAME), *Arctic Council Regional Action Plan on Marine Litter in the Arctic (Iceland, Norway, Sweden, Canada, Finland, Kingdom of Denmark, USA, AIA, OSPAR)* (Reykjavik, 2021) at: https://www.arctic-council.org/projects/regional-action-plan-on-marine-litter (accessed 28 September 2021).

[22] Protection of the Marine Arctic Environment (PAME), *Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-based Activities* (2008) at: https://oaarchive.arctic-council.org/handle/11374/872?show=full (accessed 20 June 2018).

Materials and Methods

This study combined two approaches: mapping relevant international, national, and, in the case of northwest Russia, subnational laws and regulations, and a survey of fishing industry actors operating in the Barents Sea.

A questionnaire was developed to collect primary data for the international, transdisciplinary research project, titled *MARine Plastic Pollution in the Arctic: Origin, Status, Costs, and Incentives for Prevention (MARP3)*, conducted during 2016–2019 and funded by the Research Council of Norway. The Norwegian and Russian research team collaborated with Norwegian and northwest Russian fishing industry organizations in conducting the questionnaire. The purposes of the questionnaire were to obtain firsthand information on fishing industry actors' practices, knowledge, attitudes, and opinions regarding marine litter, particularly marine plastic litter; to better understand some aspects of the problem; and to identify possible solutions. The questionnaire included statements to which participants were asked to place themselves on a 5-point Likert scale (5 = fully agree, 1 = completely disagree). In addition, participants were encouraged to provide any additional comments they wished to share, using free-format answers.

The questionnaire was administered online to reach as many respondents as possible.[23] Participants were approached through fishing industry organizations in Norway and northwest Russia from September 2017 until May 2018.

In Norway, we cooperated with three nationwide organizations: the Norwegian Fishermen's Association, the Norwegian Fishing Vessel Owners Association, and the Norwegian Coastal Fishermen's Union. As of January 2018, there were 9200 registered full-time fishers and 1621 part-time fishers in Norway,[24] 6400 of whom were in the three organizations. The survey was announced and promoted on the fisher organizations' webpages and social media platforms, with links to the questionnaire. In addition, the fisher organizations distributed the questionnaire by e-mail to their members. In total, 126 fishing industry actors in Norway answered the questionnaire online. As the response rate was lower than the researchers and the fisher organizations anticipated, we approached fishers in harbors in the spring of 2018, where we were able to hand out and collect 40 paper versions of the questionnaire in fishing harbors in Tromsø and Lofoten. An additional 31 respondents were reached at the annual meeting of the Norwegian Fishermen's Association branch in Nordland County in September 2017, where attendants were handed paper versions of the questionnaire. In total, 197 fishing industry actors in Norway responded to the questionnaire. Hence, we experienced a relatively low response rate. A fishing organization representative in Norway corroborated our observation that the response rate was low, commenting that in general, fishing industry actors do not readily respond to survey questionnaires.

In northwest Russia, we cooperated with the Fishing Industry Union of the North in Murmansk, an association for fishing companies in the Northern Basin, with 62 fishing

[23] Xiaochi Zhang, Lars Kuchinke, Marcella L. Woud, et al., "Survey Method Matters: Online/Offline Questionnaires and Face-to-Face or Telephone Interviews Differ" (2017) 71 *Computers in Human Behavior* 172.

[24] Norwegian Directorate of Fisheries/Fiskeridirektoratet. Fiskeridirektoratets statistikk/Statistics (2019) at: www.fiskeridir.no/yrkesfiske (accessed 10 October 2020).

companies as members.[25] Through frequent interactions, the Fishing Industry Union of the North is well informed about fishing boat owners and their crew, and claimed to be familiar with fishing-sector concerns, including members' attitudes and awareness, as well as perceptions of solution options. The administration of the Fishing Industry Union of the North had modest expectations for online survey participation. However, it agreed to encourage member companies to take part in the survey, and assisted the Russian research team in contacting other potential respondents by e-mail or phone. In total, the survey received completed questionnaires from 32 companies. One questionnaire was eliminated in the data analysis process due to being incomplete, resulting in a total of 31 usable questionnaires.

The respondents were informed that their answers would be kept anonymous, and that their confidentiality would be protected. We did not ask for names, gender, age, residence, e-mail addresses, name of vessel, or other identification markers. In cases where respondents were contacted by e-mail or phone, they were assured that all information inadvertently acquired through such means of contact would be kept anonymous and confidential. All respondents gave their informed written or verbal consent to participate in the survey.

With the benefit of hindsight, we acknowledge that the reluctance of fishing industry actors to answer survey questionnaires could have been considered more carefully when deciding the means of obtaining the data, whether online or in person. Fishing industry actors' occupational time is spent on the sea, working irregular shifts in challenging surroundings. Clicking on survey links may disturb or annoy them. A methodological lesson from our approach was that approaching fishers in harbors in Norway led to a better response rate than the online version. With the benefit of hindsight, knowing that it is more time-consuming and requires considerably more resources than we had prepared for and had project funds for, a follow-up study would be designed in a different way.

The survey experience in northwest Russia was different. The Russian researchers were confident that they would be prevented from approaching respondents in harbors by captains or shipping companies. In addition, access to harbors in northwest Russia was physically restricted. Moreover, the Fishing Industry Union of the North explained that crew members hired on the larger vessels would likely decline to participate in the survey. They would have limited time, energy, and willingness to answer our questions in between their working shifts, even if they were physically approached in the harbor.

Owing to the low response rate, we cannot make statistical generalizations about the findings. Nevertheless, the survey provides useful information about practices and attitudes to waste among fishing industry actors. While we cannot claim that the practice or viewpoints are valid for all fishing industry actors in Norway or Russia, we can claim that certain practices and viewpoints exist.

Ethical approval for the survey was obtained from the Norwegian Center for Research Data, which also considers applications for international studies. In Russia, there was no requirement to obtain ethical approval for surveys.

[25] http://srps.ru (accessed 8 June 2019).

The International Legal Framework Applicable to Marine Litter in the Barents Sea

The purpose of the following sections is to provide an overview of the legal regulations that address marine litter from fishing activities at the global level, and then to examine how the rules have been implemented at both regional and national levels.

Several instruments at international, regional, and national levels have been developed to address the problem of marine litter. While broader environmental obligations and principles, such as the Convention on Biological Diversity[26] and the Precautionary Principle,[27] are of general relevance and significance, this section addresses international and national regulations that have the specific aim of preventing marine litter. There is a comprehensive, complex, and potentially overlapping set of relevant regulations addressing marine waste from fishing vessels and fishing harbors at the international level, derived from both marine pollution law and international fisheries law.

The Relevant Global Instruments

United Nations Convention on the Law of the Sea

The United Nations Convention on the Law of the Sea of 1982 (UNCLOS),[28] to which both Russia and Norway are parties, provides the main legal framework for the management of marine areas in the Barents Sea. UNCLOS allocates states' jurisdiction in different maritime zones, and sets out states' rights and obligations within those zones.[29] As coastal states, Norway and Russia have sovereignty in their territorial seas and sovereign rights over marine resources in their respective exclusive economic zones (EEZ). As such, it is within their jurisdiction to manage and conserve the marine living resources within their EEZ and territorial sea in accordance with their obligations to protect and preserve the marine environment.[30]

A fishing vessel operates under the flag of its flag state. When the vessel navigates on the high seas, it is under the exclusive jurisdiction of that flag state.[31] However, when it enters the maritime zones of a coastal state, the jurisdiction of that coastal state applies concurrently.[32] If a vessel calls into a port of that state, it becomes subject to port state jurisdiction. The concept of the port state denotes capacities in which a state can act in order to further its own interests or to comply with international commitments. As ports lie within states' territorial sovereignty, they offer an opportunity to control foreign ships' compliance with national and international standards.[33]

[26] Convention on Biological Diversity, adopted 22 May 1992, entered into force 29 December 1993.
[27] Ad van Dommelen, "The Precautionary Principle: Dealing With Controversy" (1997) 43 *Biotechnology and Development Monitor* 8.
[28] United Nations Convention of the Law of the Sea, adopted 10 December 1982, entered into force 16 November 1994, 1833 UNTS 397 [hereinafter, UNCLOS].
[29] Henrik Ringbom, 'Vessel-Source Pollution' in R. Rayfuse (ed), *Research Handbook on International Marine Environmental Law* (Edward Elgar, 2015), 105.
[30] UNCLOS, Arts. 56, 92 and 93.
[31] Erik J. Molenaar, "Port and Coastal States" in Donald R. Rothwell, Alex Oude Elferink, Karen N. Scott, et al. (eds), *The Oxford Handbook of The Law of the Sea* (Oxford University Press, 2015), 280.
[32] Ibid, 294.
[33] Ibid, 287.

UNCLOS Part XII, Protection and preservation of the marine environment, provides for legal obligations on environmental protection that apply to all states in all maritime zones. Pursuant to Article 192 of UNCLOS, all states have an obligation to protect and preserve the marine environment. This general obligation is comprehensive and covers all activities, as well as fisheries and pollution. Although the general obligation in Article 192 of UNCLOS is comprehensive and addresses the protection and preservation of the marine environment as such, most of the obligations in Part XII deal with the prevention, reduction, and control of pollution. The introduction of plastic waste from fishing vessels into the marine environment qualifies as marine pollution,[34] and parties have a specific obligation under Article 194(1) of the Convention to "take, individually or jointly as appropriate, all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source." Furthermore, according to Article 194(2) of UNCLOS, states shall "take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment," and must ensure "pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with this Convention."[35]

The general obligations in Articles 192 and 194 are elaborated in Articles 207–212, which deal with pollution from different sources. Considering the focus of the present study, Article 211 on vessel source pollution is of crucial relevance and importance for the prevention of marine litter. The provision recognizes coastal state sovereign jurisdiction to adopt laws and regulations for the prevention, reduction, and control of vessel source pollution, provided that its exercise does not hamper innocent passage of vessels through the territorial sea.[36] Beyond the territorial sea the rights of the coastal state are structured around the reference to international rules and standards, normally adopted by the International Maritime Organization (IMO). Article 211(1) calls upon all states to develop such technical standards, which then in turn serve as a reference point and a mandatory regulatory minimum for flag states,[37] and the mandatory regulatory maximum for coastal states in the EEZ.[38] As the focus of our study is the generation of waste during fishing activities, and for the sake of conciseness, we assume that such disposal is not covered by the rules of dumping, which excludes the disposal of wastes or other material incidental to or derived from the normal operation of vessels from its definition.[39]

[34] Marine pollution is defined in UNCLOS Article 1(4) as the "introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water, and reduction of amenities."

[35] UNCLOS, Art. 194(2).

[36] UNCLOS, Art. 211(4).

[37] UNCLOS, Art. 211(2).

[38] UNCLOS, Art. 211(5).

[39] UNCLOS, Art. 1(5)(b). Note, however, the recent comprehensive treatment of the issue by Robin Churchill, "Just a Harmless Fishing Fad—or Does the Use of FADs Contravene International Marine Pollution Law?" (2021) 52(2) *Ocean Development and International Law* 169, 175–176, where the author compellingly argues against treatment of the abandonment of fish aggregation devices as "incidental" or "derived from the normal operation" of a fishing vessel.

MARPOL Convention—Annex V

The International Convention for the Prevention of Pollution from the Ships (MARPOL 73/78)[40] is a major international instrument regulating marine litter and marine pollution from vessels, to which both Russia and Norway are parties. The six Annexes to MARPOL 73/78 contain detailed and technical regulations and cover various sources of marine pollution.[41] MARPOL Annex V on Regulation for the Prevention of Pollution by Garbage from Ships[42] comprises the most important international regulatory instrument to prevent and minimize the discharge of marine litter from vessels. While MARPOL Annex V is optional, it has broad support worldwide with more than 150 parties. Both Norway and Russia have accepted Annex V. Annex V was amended in 2011 to take a precautionary approach, prohibiting all discharges of waste, unless exemptions apply.[43] MARPOL's definition of garbage corresponds to the definition of "waste" set out in the introduction to the paper, and includes "all kinds of food wastes, domestic wastes and operational wastes, *all plastics,* cargo residues, incinerator ashes, cooking oil, *fishing gear,* and animal carcasses generated during the normal operation of the ship" (emphasis added). The ban on discharge in MARPOL Annex V Regulation 3 does not apply to the discharge of garbage from a ship necessary in order to secure the safety of a ship or the discharge of fishing gear for the protection of the marine environment. Similarly, MARPOL Annex V Regulation 7 provides for an exception in respect of accidental loss of fishing gear, provided that all reasonable precautions to prevent such loss were taken. This may be because accidental loss of fishing gear is closely connected to fishing activities and can be regulated and enforced by coastal states when exercising their sovereign rights over marine resources in the EEZ. MARPOL Annex V Regulations 8 and 9 also include requirements on waste reception facilities and port state control on operational requirements. Furthermore, MARPOL Annex V includes obligations on garbage management plans and garbage recordkeeping, with exemptions for ships under 100 gross tonnages with respect to management plans and for record books in relation to ships under 400 gross tonnages. The legal literature identifies this a *gap*, as the exemption applies to many fishing vessels.[44]

International Fisheries Regulations

In addition to instruments that deal with waste as marine pollution, the problem of marine plastic and litter is also addressed in international fisheries regulations. The United Nations Fish Stock Agreement was adopted in 1995 as an implementation agree-

[40] International Convention for the Prevention of Pollution from Ships of 2 November 1973, as amended, opened for signature 17 February 1978, 1340 UNTS 184, entered into force 2 October 1983 [hereinafter, MARPOL].
[41] James Harrison, "Saving the Oceans through Law: The International Legal Framework for the Protection of the Marine Environment" (2018) 27 *Yearbook of International Environmental Law* 565.
[42] Annex V to the International Convention for the Prevention of Pollution from Ships as modified by the Protocol of 1978 relating thereto, adopted on 2 November 1973/17 February 1978, entered into force 2 October 1983, 1340 UNTS 62 (MARPOL 73/78).
[43] International Maritime Organization, Resolution, MEPS.201(62), Amendments to the Annex of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships (1973) (revised MARPOL, Annex V), Regulation 3.
[44] Chung-Ling Chen and Ta-Kang Liu, "Fill the Gap: Developing Management Strategies to Control Garbage Pollution From Fishing Vessels" (2013) 40 *Marine Policy* 34.

ment to UNCLOS.[45] Both Norway and Russia are state parties to the UN Fish Stock Agreement. The Agreement applies to the conservation and management of straddling and highly migratory fish stocks in areas beyond national jurisdiction, while certain general principles and obligations apply within national jurisdiction. The objective of the UN Fish Stock Agreement is to ensure the long-term conservation and sustainable use of straddling and highly migratory fish stocks. To achieve this objective, the UN Fish Stock Agreement applies the precautionary approach in Article 6 and also sets out a number of general principles in Article 5 of application to straddling and highly migratory stocks within the national jurisdiction of states. Specifically, Article 5(f) of the Agreement concerns plastic pollution from fisheries, and it requires states to "minimize pollution, waste, discards, catch by lost or abandoned gear … through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost-effective fishing gear and techniques." Although the obligations are quite vague, giving states broad discretion regarding compliance, it nevertheless requires states to take action in respect of lost fishing gear and to develop and use environmentally friendly fishing gear.

In addition, the Code of Conduct for Responsible Fisheries[46] adopted by the Food and Agriculture Organization (FAO) of the United Nations includes globally applicable guidelines designed to minimize plastic pollution from fisheries. The guidelines are not legally binding; however, they encourage states to cooperate in developing and using technology, materials, and methods to minimize the loss of fishing gear and the effects of ghost fishing. The phenomenon of ghost fishing occurs when derelict or lost fishing gear, such as trawl nets, gill nets, traps, cages and pots, continues to fish and create death traps without escape. Durable fishing gear can continue to ghost fish for years after it has been lost. The catch decomposes and attracts more species, creating a vicious circle.[47] The guidelines also encourage states to comply with regulations for handling and storage of shipboard garbage and guidance on waste disposal systems for fishing vessels in harbors.[48] Furthermore, the guidelines encourage states to implement and enforce regulations based on MARPOL.

The North-East Atlantic Fisheries Commission (NEAFC) is the relevant regional fisheries organization for the management of fish stocks in the North-East Atlantic and adjoining areas. Both Norway and Russia are contracting parties to NEAFC. Regulations of relevance and importance for minimizing plastic pollution adopted under NEAFC include requirements relating to the marking and retrieval of gear and notification of the flag state in cases of lost gear.[49]

[45] United Nations Fish Stock Agreement, Agreement for the Implementation of the Provisions of the United Nations Conventions on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, adopted 4 August 1995, entered into force 11 December 2001, 2167 UNTS 88 [hereinafter, UN Fish Stock Agreement].

[46] Food and Agriculture Organization, FAO Code of Conduct for Responsible Fisheries (Rome, 1995) at: https://www.fao.org/3/v9878e/v9878e.pdf (accessed 1 June 2018).

[47] Stephanie Newman, Emma Watkins, Andrew Farmer, et al., "The Economics of Marine Litter" in Melanie Bergmann, Lars Gutow, and Michael Klages (eds), *Marine Anthropogenic Litter* (Springer International Publishing, 2015), 367; NOWPAP—Northwest Pacific Action Plan, *Regional Action Plan Marine Litter* (2008) at: https://www.cbd.int/doc/meetings/mar/mcbem-2014-03/other/mcbem-2014-03-130-en.pdf (accessed 3 May 2021).

[48] FAO Code of Conduct for Responsible Fisheries, note 46, Art. 8.9 (d).

[49] North East Atlantic Fisheries Commission (NEAFC), NEAFC Scheme of Control and Enforcement, Arts. 7 and 7(b) at: https://www.neafc.org/mcs/scheme (accessed 3 May 2021).

Relevant Regional Instruments

OSPAR Convention

The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention)[50] provides for general obligations to protect the marine environment and biological diversity in the North-East Atlantic Ocean and has been ratified by 15 states, including Norway, but excluding Russia. Under Article 2 of OSPAR, contracting parties shall

> take all possible steps to prevent and eliminate pollution and shall take the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems and, when practicable, restore marine areas which have been adversely affected.

The general obligation in Article 2 of OSPAR is developed through obligations in Articles 3–7 and further elaborated in Annexes I–V and Appendices 1–3. OSPAR governs activities such as dumping, pollution from land-based sources, assessment of the quality of the marine environment, and conservation of marine biodiversity and ecosystems, all of which are relevant for preventing and minimizing marine plastic pollution. Although OSPAR aims to take a comprehensive approach and protect the marine environment from human activities, it does not directly address fishing and shipping activities.[51] However, initiatives and efforts directed at mitigating marine waste from fisheries have been developed under OSPAR.

In 2010, for example, the OSPAR Commission agreed on the Fishing for Litter program.[52] As a follow-up, in 2014, the OSPAR Commission adopted a Regional Action Plan for the prevention and management of marine litter.[53] The main objective of the action plan was to prevent and reduce marine litter pollution in the North-East Atlantic through actions to combat sea- and land-based sources of marine litter with litter removal, education, and outreach. Action to combat sea-based sources of litter include recommendations to parties to ensure compliance and enforcement of relevant European Union (EU) directives and international law, and to develop best practice in waste management by the fishing industry.[54]

In Norway, Fishing for Litter was established as a two-year project (2016–2017) by the Norwegian Environment Agency in response to recommendations under OSPAR. Twenty-eight oceangoing vessels and four harbors (Tromsø, Ålesund, Egersund, and Karmøy) participated in the first phase of the project. Fishing for Litter was extended beyond the initial two-year frame and expanded to include 11 participating harbors.[55] The purpose of Fishing for Litter is to disseminate knowledge regarding the composition of litter that fishing vessels take up from the ocean on a typical fishing trip and to

[50] Convention for the Protection of the Marine Environment of the North-East Atlantic, adopted 22 September 1992, entered into force 25 March 1998 [hereinafter, OSPAR].
[51] OSPAR, Preamble.
[52] OSPAR Commission, "On Fishing for Litter Initiatives, Recommendation" (2010) at: https://www.ospar.org/work-areas/eiha/marine-litter/regional-action-plan/fisheries-related-actions/fishing-for-litter (accessed 20 September 2020).
[53] OSPAR, *Regional Action Plan for Prevention and Management of Marine Litter in the North-East Atlantic*, (2014) at: https://www.ospar.org/documents?v=34422 (accessed 3 May 2021).
[54] Ibid, 8.
[55] Hilde Rødås Johnsen, Emil Røhte Johannessen, Ane Oline Roland, et al., *Fishing for Litter som tiltak for marin forsøpling i Norge—Årsrapport 2020. Fishing for Litter as measure against marine waste in Norway—Annual Report 2020*, SALT (2020) at: https://salt.nu/prosjekter/fishing-for-litter-2020 (accessed 3 June 2021).

provide information on facilitating waste disposal and recycling in harbors. Fishing vessels in the project received large bags to collect litter from the ocean. The bags were delivered to harbors, where the litter was sorted, registered, and handled. Recyclable litter was delivered to Norsk Fiskeriretur (Nofir), a Norwegian company that collects and recycles discarded gear from fishing and fish farming, to be turned into new products such as clothes, furniture, and carpets.[56] In addition to its efforts to clean up the ocean, Fishing for Litter also sought to provide additional knowledge on the types of marine litter and their recycling potential, and data for the development of a sustainable litter disposal system for fishers and others who collect litter in the ocean.[57] Fishing for Litter is, in 2022, under review in Norway, and may be replaced by a flat waste fee for all fishing vessels entering Norwegian harbors, designed to motivate the disposal of waste in fishing harbors along the coast.[58]

Paris Memorandum of Understanding on Port State Control

The Paris Memorandum of Understanding on Port State Control (Paris MoU) [59] is a regional agreement that regulates port state control and inspection procedures. The purpose of inspections is to ensure that vessels comply with the rules of international conventions, such as MARPOL.[60] All EU member states, as well as Norway, Iceland, Canada, and Russia, are parties to the Paris MoU.[61]

EU Directives

Port-related obligations arising from MARPOL are transposed into European Union law through the Port Reception Facilities Directive (PRF) Directive.[62] The PRF Directive aims to protect the marine environment against the negative effects of waste discharge from ships and to improve the availability and use of adequate port reception facilities and the delivery of waste to those facilities.[63] The PRF Directive establishes a mandatory waste notification system for ports and vessels.[64] For monitoring and enforcement, the PRF Directive uses the inspection regime introduced under the Port State Control (PSC) Directive.[65] The PSC Directive aims to reduce substandard shipping in waters

[56] Norsk Fiskeriretur. Recycling discarded equipment from fishing and fish farming, at: www.nofir.no (accessed 28 December 2020).
[57] Norwegian Ministry of Climate and Environment/Klima- og miljødepartementet, *Avfall som ressurs—avfallspolitikk og sirkulaer økonomi/Waste as a Resource—Waste Policy and Cirucular Economy* (Oslo, 2016) at: https://www.regjeringen.no/no/dokumenter/meld.-st.-45-20162017/id2558274 (accessed 3 May 2018).
[58] Alf Fagerheim, 'Vil fase ut Fishing for Litter/Wants to phase out Fishing for Litter' *Kystmagasinet* (1 July 2021).
[59] Paris Memorandum of Understanding on Port State Control, signed in January 1982, entered into operation July 1982.
[60] Baltic Marine Environment Protection Commission, *Sanctions, Penalties, and Fines Issued by OSPAR and HELCOM Contracting Parties for Waste Disposal Offences at Sea* (St. Petersburg October 2017) at: https://portal.helcom.fi/meetings/MARITIME%2017-2017-409/MeetingDocuments/10-1-Rev1%20Baltic%20Sea%20Clean%20Shipping%20Guide%20-%20revised%202017%20edition.pdf (accessed 3 May 2018).
[61] Paris Memorandum of Understanding on Port State Control, note 59.
[62] European Parliament legislative resolution of 13 March 2019 on the proposal for a directive of the European Parliament and of the Council on port reception facilities for the delivery of waste from ships, repealing Directive 2000/59/EC and amending Directive 2009/16/EC and Directive 2010/65/EU (COM(2018)0033-C8-0014/2018-2018/0012 (COD).
[63] Ibid, Art. 1.
[64] Ibid, Art. 6.
[65] Baltic Marine Environment Protection Commission, note 60.

under the jurisdiction of member states,[66] and implements the Paris MoU within EU law.[67] The PSC Directive specifically includes the possibility for vessel inspection in relation to the mandatory waste notification system established by the PRF Directive, and enables action to be taken against vessels with respect to illegal discharges and non-compliance with MARPOL rules.[68]

Ongoing Initiatives Targeting Marine Plastic Pollution

The international community has agreed to work towards a global solution to the plastic pollution problem.[69] At the UN Environment Assembly (UNEA-5) in Nairobi in February and March 2022, heads of state, ministers of environment, and other representatives from UN member states agreed to initiate negotiations with a view to adopting an international legally binding agreement to end plastic pollution by 2024. The resolution addresses the full life cycle of plastic, including its production, design, and disposal. UNEP collaborator GRID-Arendal is coordinating Norwegian actors in order to provide input into the process toward adopting a global agreement.[70] Correspondingly, attention to solving the marine plastic pollution problem is gaining momentum in the Arctic region. In May 2021, the Arctic Council's working group Protection of the Arctic Marine Environment (PAME) published its Regional Action Plan on Marine Litter in the Arctic, with recommendations for action to reduce macro- and microplastic pollution.[71] The Research Council of Norway is addressing marine plastic pollution through its funding mechanisms, which include initiatives on international collaboration for harmonizing governance systems relevant to the Arctic.[72]

Norwegian Laws and Regulations Concerning Marine Litter from Vessels

International obligations to prevent marine litter are implemented in Norwegian law through various acts and regulations. Relevant regulations to prevent marine litter from fisheries include those that apply to fishing vessels in Norwegian waters, territorial seas, and the EEZ, as well as regulations that apply when vessels are in Norwegian ports.

[66] European Parliament, Directive 2009/16/EC of the European Parliament and of the Council of 23 April 2009 on Port State Control, amended by Directive 2013/38/EU of the European Parliament and of the Council of 12 August 2013 amending Directive 2009/16/EC on Port State Control," Art 1.
[67] Baltic Marine Environment Protection Commission, note 60.
[68] Ibid.
[69] United Nations Environment Assembly of the United Nations Environment Programme, *Draft Resolution. End Plastic Pollution: Towards an International Legally Binding Instrument* (Nairobi 22–26 February 2021 and 28 February–2 March 2022) at: https://wedocs.unep.org/handle/20.500.11822/38522 (accessed 8 November 2022).
[70] GRID-Arendal, *Exploring the Option of a New Global Agreement on Marine Plastic Pollution. A Guide to the Issues (GRID-Arendal Policy Brief)* (GRID-Arendal, 2021) at: https://www.grida.no/publications/539 (accessed 8 November 2022).
[71] Protection of the Marine Arctic Environment (PAME), note 21, 12.
[72] Research Council of Norway/Project Bank, *Governance of Marine Litter in the Arctic (GOMPLAR). Comparing international governance and legal frameworks to inform Arctic governance* (2020) at: https://prosjektbanken.forskningsradet.no/project/FORISS/315402?Kilde=FORISS&distribution=Ar&chart=bar&calcType=funding&Sprak=no&sortBy=date&sortOrder=desc&resultCount=30&offset=120 (accessed 3 June 2021).

Vessels

The Ship Safety and Security Act 2007

The Ship Safety and Security Act 2007[73] and regulations adopted pursuant to it implement international rules relating to marine pollution and litter reflected in UNCLOS, MARPOL, and the London Convention in Norwegian law. MARPOL Annex V is incorporated into Norwegian law through regulations adopted under the Ship Safety and Security Act.[74] The Ship Safety and Security Act section 1 aims to "safeguard life, health, property, and the environment by facilitating a high level of ship safety and safety management, including preventing pollution from ships." According to Section 2, the Act applies to Norwegian and foreign vessels more than 24 meters in overall length used for commercial purposes that operate in Norwegian waters, including territorial waters and the EEZ. Section 31 includes a prohibition against pollution:

> Pollution of the external environment by the discharge or dumping from ships, or by the incineration of harmful substances, or pollution in any other way in connection with the operation of the ship is prohibited, unless otherwise decided by law or regulation laid down pursuant to law.

Exceptions to this main rule, such as the discharge of harmful substances necessary for the safety of the ship, follow regulations defined in Section 31 of the Act.

Marine Resources Act 2008

The Marine Resources Act 2008 aims to "ensure sustainable and socioeconomically profitable management of wild living marine resources."[75] Section 17 of the Act sets out a general obligation to search for lost gear and avoid ghost fishing, and the government has, on this basis, adopted regulations relating to reports of gear that is lost or found.[76] Section 69 of the regulations on fisheries and harvesting marine living resources establishes a duty to report loss of gear to the authorities, which helps the government identify lost gear to be cleaned up, thereby preventing ghost fishing and damage to the environment caused by gear breaking down into microplastics. In addition, Article 28 of the Marine Resources Act includes a prohibition on leaving objects in the sea:

> [It] is prohibited to dump gear, moorings and other objects in the sea or *leave* such objects *unnecessarily* in the sea or on the seabed if they may injure marine organisms, impede harvesting operations, damage harvesting gear or endanger vessels. (emphasis added)

The use of "leave … unnecessarily" indicates a strict duty. The preparatory work for the Marine Resources Act also indicates that the threshold of "unnecessarily" is low.[77] In addition, the Marine Resources Act establishes a duty to clear up or remove the

[73] Act of 16 February 2007 No. 9 relating to ship safety and security/Lov om skipssikkerhet (Ship Safety and Security Act).
[74] Regulations of 30 May 2012 No. 488 on environmental safety for ships and mobile offshore units, section 11, (Regulations on Environmental Safety for Ships), Ministry of Trade, Industry and Fisheries/Naerings- og fiskeridepartementet.
[75] Act of 6 June 2008 no. 37 relating to the management of wild living marine resources (Marine Resources Act).
[76] Regulations of 29 December 2001 on fisheries and harvesting of marine living resources/Forskrift om gjennomføring av fiske, fangst og høsting av viltlevende marine ressurser (regulations on harvesting of marine living resources), Ministry of Trade, Industry and Fisheries/Naerings- og fiskeridepartementet.
[77] Ot.prp. no. 20 (2007–2008) p. 199 (Report to the Norwegian Parliament).

objects in question on any person who acts in contravention of the prohibition. In the event of a failure to comply, the authorities may, according to Section 28 of the Marine Resources Act, implement any necessary measures at the expense and risk of the party responsible.

Ports

Port Reception Facilities

Norway has implemented the PRF Directive into its national legislation through the 2007 Ship Safety and Security Act, the 2012 Regulations on Environmental Safety for Ships and Chapter 20 of 2004 Pollution Regulations adopted on the basis of the 1981 Pollution Control Act.[78] Section 2 of the Ship Safety and Security Act and Chapter 20, Section 20-2a of the 2004 Pollution Regulations apply to all ships, including all fishing vessels. Section 1 of the 2012 Regulations on Environmental Safety for Ships applies to Norwegian territorial waters and the Norwegian EEZ, covering fishing ports and harbors.

These laws impose duties on the vessel operator as well as on the port operator. Specifically, the company, master, and others working onboard a vessel must perform their duties pursuant to the 2007 Ship Safety and Security Act and implementing regulations, such as Section 20-4 of 2004 Pollution Regulations. Fishing vessels visiting Norwegian ports must deliver their waste to a port reception facility and discharge any harmful substances to special reception facilities.[79] The Norwegian Maritime Authority is responsible for supervising ships' compliance under Chapter 20 of Pollution Regulations.[80] The ship master must notify the port operator of waste delivery prior to arrival.[81] The notification must include details of the amount of plastic waste to be delivered.[82] If the waste to be delivered does not match the notification, the port operator must report the breach to the Norwegian Maritime Authority.[83] The port operator, whether a private owner or a municipality, is responsible for providing port reception facilities that are "adequate to meet the normal needs for delivery in the port."[84] The port operator must have a waste management plan.[85] The county governor is the authority that approves waste management plans and oversees the compliance of port operators.[86]

Port State Control

The Norwegian Maritime Authority functions as the port state control authority in Norway.[87] The inspection regime is separated into inspections of Norwegian flagged

[78] Act of 13 March 1981 No. 6 Concerning Protection Against Pollution and Concerning Waste (Pollution Control Act) Regulations of 1 June 2004, Regulations Relating to Pollution Control (Pollution Regulations), Ministry of Climate and Environment/Klima- og Miljødepartementet.
[79] 30 May 2012 No. 488 Regulations on Environmental Safety of Ships and Mobile Offshore Units, Section 16.
[80] 2004 Pollution Regulations, Section 20-12.
[81] Ibid, Section 20-7.
[82] Ibid, Section 20-7 and Annex II.
[83] Ibid, Section 20-8.
[84] Ibid, Section 20-5.
[85] Ibid, Section 20-6.
[86] Ibid.
[87] Norwegian Maritime Authority/Kystverket. Regulations of 24 November 2014 No. 1458 on Port State Control.

vessels and inspections of foreign flagged vessels.[88] Norwegian flagged vessels are inspected based on amendments to Regulations of 22 December 2014, No. 1893,[89] while foreign flagged vessels are regulated by the PSC Directive. Norway has implemented the PSC Directive into its national legislation through amendments to Regulations of 24 November 2014, No. 1458,[90] applying it to "foreign fishing vessels of 24 meters in overall length and upward, calling at a Norwegian port, landing catch in a Norwegian port, or fishing, catching, or processing living resources in Norwegian territorial waters."[91]

Russian Laws and Regulations Concerning Marine Litter From Vessels

Russian law on marine litter from vessels encompasses a wide range of acts adopted at different governance levels. The following section provides a brief overview of relevant laws regulating plastic waste management onboard fishing vessels and in ports applicable to Russian vessels operating in the Barents Sea.

Overview of Relevant Russian Legislation

The 2002 Federal Law on Environmental Protection[92] sets out the legal basis for state policy in the field of environmental protection, including "the establishment of fees for negative impact on the environment."[93] Pursuant to Article 16 of the 2002 Federal Law on Environmental Protection, the fees for negative impact on the environment are charged for the emission of pollutants into the air by stationary sources, the discharge of pollutants into water bodies, and the disposal of waste. A specific procedure for calculating and levying fees for negative impact on the environment is set out in Resolutions adopted by the government of the Russian Federation.[94]

The 1998 Federal Law on Production and Consumption Wastes sets out the framework for waste management in Russian law.[95] This legal act defines production and consumption waste as "substances or objects that are formed in the production process, work, services, or in the consumption process, which are disposed of, are intended to be disposed of or are subject to disposal in accordance with this Federal Law."[96] This law was subject to significant amendments in 2014, and there is currently public discussion on whether principles supporting a circular economy should be introduced.

[88] Ibid.
[89] Regulations of 1 January 2014 on inspection and certificate for Norwegian ships and mobile units/ Forskrift om tilsyn og sertifikat for norske skip og flyttbare innretninger, Ministry of Trade, Industry and Fisheries/Naerings- og fiskeridepartementet.
[90] Norwegian Maritime Directorate/Sjøfartsdirektoratet, 2014, Regulations of 24 November 2014 No. 1458 on Port State Control.
[91] Ibid. Chapter 2, Section 4a.
[92] Federal Law of the Russian Federation, No. 7-FZ "On Environmental Protection," 10 January 2002, as amended.
[93] Ibid, Preamble.
[94] Resolution of the Government of the Russian Federation, No. 913, "On the Rates of Payment For Negative Impact on the Environment and Additional Coefficients," 13 September 2016, as amended by the Resolution of the Government of the Russian Federation, No. 1393, "On the Application in 2021 of the Rates of Payment for Negative Impact on the Environment," 09 November 2020.
[95] Federal Law of the Russian Federation, No. 89-FZ "On Production and Consumption Wastes," 24 June 1998, as amended.
[96] Ibid.

Russian legislation regulates waste discharge through two federal laws on Russian maritime zones. Article 37 of the 1998 Federal Law on the Internal Waters, Territorial Sea, and Contiguous Zones[97] prohibits the dumping of waste and other matter and the discharge of harmful substances in internal waters and the territorial sea. Article 30 of the 1998 Federal Law on the EEZ[98] deals with the discharge of hazardous substances in the EEZ. Article 30(2) of the law prohibits the discharge of any substance included in the list published in Notices to Mariners. The list was established by the Decree of the Government of the Russian Federation of 24 March 2000, N 251.[99] The list specifically includes all types of plastics, including synthetic cables, synthetic fishing nets, and plastic trash bags, as well as "garbage" as defined by MARPOL Annex V.

In addition, Article 56(1) of the amended 2006 Water Code[100] prohibits "discharge into water bodies and burial of production and consumption waste, including decommissioned ships and other floating equipment (parts and mechanisms)."

Vessel and Port Regulations

Russian legislation includes specific regulations applicable to vessels. Of particular relevance to this article is the 1999 Order of the State Committee on Fisheries.[101]

This legal act is of principal importance as it implements general provisions arising from Russian federal laws and relevant international legal obligations. Most crucially, Article 1.1.3 of the Order requires that Russian flagged fishing vessels navigating beyond Russian territorial seas and internal waters shall comply with all applicable regulations of MARPOL. As such, any amendments to MARPOL are directly incorporated into Russian legislation for fishing vessels. Article 1.1.4 of the Order stipulates that all fishing vessels navigating Russian maritime zones must comply with the 2002 Federal Law on Environmental Protection.

Chapter 13 of the Order deals specifically with the prevention of waste pollution. Article 13.1.1 stipulates that the international and national requirements for the prevention of waste pollution apply to all ships, regardless of their size, the size of the crew, or their date of construction. Chapter 13 addresses the different maritime zones. The dumping of plastic waste is prohibited in the high seas. The dumping of waste, which presumably includes plastic waste, is prohibited in the EEZ, and the dumping of any waste is prohibited in territorial seas and internal waters. Furthermore, Article 13.3 prescribes specific requirements pertaining to the storage of waste, including plastic waste on board vessels, and Article 13.6.2 stipulates that the port is obliged, upon the vessel's request, to receive waste in a timely manner.

[97] Federal Law of the Russian Federation, No. 155-FZ "On the Internal Waters, Territorial Sea and Contiguous Zone of the Russian Federation," 31 July 1998, as amended.
[98] Federal Law of the Russian Federation, No. 191-FZ "On the Exclusive Economic Zone of the Russian Federation," 17 December 1998.
[99] Resolution of the Government of the Russian Federation, No. 251, "On the Approval of the List of Hazardous Substances, the Discharge of Which in the Exclusive Economic Zone of the Russian Federation From Ships, Other Floating Equipment, Aircraft, Artificial Islands, Installations And Structures Is Prohibited," 24 March 2000.
[100] The Water Code of the Russian Federation, No. 74 FZ, 3 June 2006, as amended.
[101] Order of the State Committee of the Russian Federation for Fisheries, N 134, "On Implementation into Action—Instructions for Preventing Pollution from Vessels of the Fishing Fleet of the Russian Federation," 27 May 1999.

The 2001 Order of the State Committee on Fisheries deals with "the introduction of a consolidated registry of deliveries to the receiving facilities in ports of wastes and substances harmful to human health or to living marine resources."[102] It requires vessels that are not covered by MARPOL to have a consolidated registry of deliveries of waste and substances that may be hazardous for human health or the living resources of the sea to be delivered to reception facilities in ports. It specifically covers plastic waste. In addition, the Order of the Ministry of Transport of the Russian Federation of 26 October 2017 regulates the behavior of ships approaching Russian ports.[103] This order sets out specific regulations on the types of waste to be collected at seaports.

Provisions for the enforcement of these laws and regulations are set out in Chapter 8 of the Code of Administrative Offences (CAO), which deals with administrative offenses in the sphere of environmental protection.[104] Article 8(2) of the Code stipulates the penalties for noncompliance with the requirements in the field of environmental protection during the collection, accumulation, transportation, processing, or disposal of production and consumption waste.

Survey Results

The survey results are derived from a set of 26 questions covering respondents' engagement in the fishing industry, type of fishing they engage in, their experience with marine pollution, specifically marine plastic litter, what types of litter they have encountered, their knowledge of and obligement of dealing with marine litter, attitudes toward littering while on a vessel, and experience with waste management systems in fishing harbors. Some questions were in the form of statements, where respondents placed themselves on a 5-point scale (5 = fully agree, 4 = somewhat agree, 3 = neither agree nor disagree, 2 = somewhat disagree, 1 = completely disagree). In addition, respondents were encouraged to give additional comments using free-format answers.

Respondents' Positions on Vessels, Fishing Areas, and Vessel Ages

We asked respondents about their positions on the vessels, providing a set of predefined categories based on the inputs from fishing industry experts. The categories were not mutually exclusive, allowing respondents to select more than one position, as one person could hold a combination of roles onboard a vessel. Forty percent of the respondents in Norway defined themselves as fishers. In northwest Russia, respondents included owners, skippers, mates, a chief engineer, and a steward, and none answered as fishers (see Table 1).

The survey revealed that the Barents Sea is the most important fishing field for 90 percent of respondents in northwest Russia and 84 percent of respondents in Norway.

[102] Order of the State Committee of the Russian Federation for Fisheries, No. 365, "On the Introduction of the Consolidated Register of Accounting and Delivery to Receiving Devices at Ports of Waste and Substances Harmful to Human Health or to Living Resources of the Sea," 16 November 2001.

[103] Order of the Ministry of Transport of the Russian Federation No. 463, "On the Approval of the General Rules for Navigation and Anchorage of Vessels in the Seaports of the Russian Federation and on Approaches to Them," 26 October 2017.

[104] Russian Federation, "Code of the Russian Federation on Administrative Offenses," No. 195-FZ, 30 December 2001, as amended.

Table 1. Position on vessel, Norway and northwest Russia.

Position on vessel	Norway (*N*)	Norway (%)	Russia (*N*)	Russia (%)
Owner	117	59.7	10	31.3
Skipper	90	45.9	15	46.9
Mate	35	17.9	5	15.6
Chief engineer	20	10.2	1	3.1
Steward	14	7.1	1	3.1
Fisher	78	39.8	0	0
Other	10	5.1	0	0
Total	196	100	32	100

The size of the vessels the respondents work on reflects the overall fleet structures in both Norway and northwest Russia. While respondents in Norway worked on a range of vessels, from coastal to oceangoing, 91 percent of the respondents in northwest Russia worked on the largest oceangoing vessels, and the rest ($N = 3$) on medium-sized coastal vessels (see Table 2).

Most Russian vessels were built in the 1990s, while the age of the Norwegian vessels showed a higher diversity. The diversity of the Norwegian fleet structure was also reflected in the fishing gear used by the respondents, with fishing nets and long line being the most common. Among the Russian vessels, 58 percent were bottom trawlers with also some pelagic trawls, purse seines, and others using fishing nets.

Waste Management on Vessels

Regarding the statement in the survey "I do not throw plastic waste overboard, as we have a waste management system onboard," respondents were asked to place themselves on the 5-point scale from "agree fully" to "completely disagree" (Table 3). Most respondents stated that the vessels they work on have waste management systems. For the survey in Norway, we controlled whether the answers correlated with vessel size, since it could be assumed that larger vessels are more likely to have a waste management system, as there would be more space onboard. The results revealed that 60 percent of respondents on the smallest vessels and 83 percent of respondents from the largest vessels indicated having a waste management system on board.

Next, we asked the respondents whether lack of space onboard was a reason for throwing plastic waste overboard, in the form of the following statement: "I throw plastic waste overboard due to lack of space onboard." The respondents were given alternatives on a 5-point scale from "agree fully" to "completely disagree," and Table 4 shows how they replied.

Among the respondents in northwest Russia, 52 percent gave a "neither agree nor disagree" response over whether waste was thrown overboard owing to lack of space, while 29 percent disagreed. Among the respondents in Norway, only 2 percent gave a "neither agree nor disagree" answer, while 92 percent completely disagreed. Results by vessel size were similar, with 94 percent of the largest and 87 percent of the smallest vessel respondents completely disagreeing with the statement that they throw waste overboard owing to a lack of space (Table 5).

Next, we asked the respondents to respond to the statement "Waste stored onboard is well secured," which resulted in most of the respondents in northwest Russia and 9

Table 2. Size of fishing vessels the respondents worked on, Norway and northwest Russia.

Size of vessel	Norway (*N*)	Norway (%)	Russia (*N*)	Russia (%)
Small coastal, <10 m	46	23	0	0
Medium coastal, 10–14.9 m	66	34	3	9
Large coastal, 15–20.9 m	17	9	0	0
Oceangoing, 21–27.9 m	16	8	0	0
Oceangoing, >28 m	52	26	29	91
Total	197	100	32	100

Table 3. I do not throw plastic waste overboard, as we have a waste management system onboard, Norway and northwest Russia.

Scale	Norway (*N*)	Norway (%)	Russia (*N*)	Russia (%)
Agree fully	117	73	19	61
Somewhat agree	20	12	5	16
Neither agree nor disagree	15	9	7	23
Somewhat disagree	3	2	0	0
Completely disagree	6	4	0	0
Total	161	100	31	100

Table 4. I throw plastic waste overboard due to lack of space on board, Norway and northwest Russia.

Scale	Norway (*N*)	Norway (%)	Russia (*N*)	Russia %
Agree fully	3	2	4	13
Somewhat agree	2	1	2	6
Neither agree nor disagree	3	2	16	52
Somewhat disagree	6	4	0	0
Completely disagree	156	92	9	29
Total	170	~101	31	100

percent of the respondents in Norway answering "neither agree nor disagree." Among the respondents in Norway, 72 percent fully agreed that waste on board is well secured. Furthermore, 89 percent of the largest and 50 percent of the smallest vessel respondents indicated full agreement with the statement (Table 5).

In order to get information about which items are most often intentionally thrown overboard, we asked, "Are you aware of items intentionally thrown overboard from the vessel you work on?" We provided a table with predefined items that are intentionally thrown overboard.[105] In addition, there was an option for the respondents to add items that were not in the predefined table of items (Table 6).

For both countries, just over half of the respondents indicated that items are never intentionally thrown overboard. With respect to the most common intentionally discarded items, the questionnaire answers by respondents in Norway indicated ropes and wires, followed by household products and strapping bands. In northwest Russia, the most common intentionally discarded items were strapping bands, followed by household products, ropes, and wires.

Table 7 shows respondents' answers regarding their compliance with law, which implicitly informs us about respondents' general knowledge of pollution regulations. We posed the statement "I do not throw plastic waste overboard because it is illegal," asking the respondents to place themselves on the 5-point scale from "agree fully" to

[105] See Nashoug, note 16, 9, and Nilsen, note 7, 34.

Table 5. Waste stored onboard is well secured, Norway and northwest Russia.

Scale	Norway (*N*)	Norway (%)	Russia (*N*)	Russia (%)
Agree fully	102	72	1	3
Somewhat agree	23	16	5	16
Neither agree nor disagree	12	9	24	77
Somewhat disagree	1	1	0	0
Completely disagree	3	2	1	3
Total	141	100	31	∼99

Table 6. Items that are most often intentionally thrown overboard fishing vessels, Norway and northwest Russia.

Are you aware of items intentionally thrown overboard from the vessel you work on? Tick the items that most often are thrown overboard.	Norway (*N*)	Norway (%)	Russia (*N*)	Russia (%)
Items are never intentionally thrown from the vessel into the sea	88	51	17	55
Household products, such as food containers, drinking bottles, detergents	36	21	4	13
Packaging material from industry operations	12	7	0	0
Ropes, wires	54	31	4	13
Fishing nets/parts of fishing nets	13	8	0	0
Netting from trawl	13	8	0	0
Floats, bobbins, buoys	6	3	2	6
Netting from ring note	1	1	0	0
Long line	11	6	1	3
Pots	2	1	2	6
Fishing boxes	7	4	1	3
Engine oil containers and oil drums	11	6	0	0
Strapping bands	15	9	6	19
Other items	24	14	0	0

Table 7. I do not throw plastic waste overboard because it is illegal, Norway and northwest Russia.

Scale	Norway (*N*)	Norway (%)	Russia (*N*)	Russia (%)
Agree fully	141	84	12	39
Somewhat agree	10	6	6	19
Neither agree nor disagree	7	4	12	39
Somewhat disagree	3	2	1	—
Completely disagree	7	4	0	0
Total	168	100	31	∼100

"completely disagree." Eighty-four percent of respondents in Norway and 39 percent of respondents in northwest Russia answered affirmatively, while 4 percent of respondents in Norway and 39 percent of respondents in northwest Russia gave a "neither agree nor disagree" answer.

For the same purpose, we posed the statement "I throw plastic waste overboard, as there is no control or system that can detect it," where the respondents placed themselves on a 5-point scale from "agree fully" to "completely disagree" (Table 8). Of the respondents in northwest Russia, 23 percent completely disagreed and 13 percent somewhat disagreed that they throw plastic waste overboard because there is no control or system that can detect it, while 52 percent gave a "neither agree nor disagree" answer. In contrast, 89 percent of the respondents in Norway answered the question with a "completely disagree" response. In addition, 3 percent of respondents in northwest Russia and 4 percent of respondents in Norway admitted to throwing plastic waste

Table 8. I throw plastic waste overboard, as there is no control or system that can detect it, Norway and northwest Russia.

Scale	Norway (*N*)	Norway (%)	Russia (*N*)	Russia (%)
Agree fully	6	4	1	3
Somewhat agree	4	2	3	10
Neither agree nor disagree	3	2	16	52
Somewhat disagree	6	4	4	13
Completely disagree	149	89	7	23
Total	168	∼100	31	∼100

overboard, by answering "agree fully." Divided by vessel size, 95 percent of the respondents on the largest vessels in Norway and 82 percent of those on the smallest vessels completely disagreed with the statement that they throw plastic waste overboard when they cannot be detected. Furthermore, 6 percent of the respondents on the smallest vessels agreed fully with the statement that they throw plastic waste overboard since there is no control or system to detect it.

Waste Management in Harbors

Tables 9 and 10 present responses regarding onshore waste delivery. We posed the statements "I do not deliver fishing gear for recycling, as there is no return deposit for fishing gear" (Table 9) and "There are insufficient waste management options in fishing harbors" (Table 10), and respondents placed themselves on the 5-point scale from "agree fully" to "completely disagree."

Among the sample in Norway, 60 percent of respondents on the largest vessels and 49 percent of those on the smallest vessels completely disagreed with the statement that they do not deliver fishing gear for recycling owing to a lack of return deposits. In contrast, 9 percent of the respondents on the largest vessels and 23 percent of the respondents on the smallest vessels fully agreed with this statement.

Among the respondents in Norway, 15 percent on the largest vessels and only 0.5 percent on the smallest vessels found waste management facilities at harbors sufficient. This is supported by the high percentage of respondents who found these facilities completely or somewhat insufficient: 64 percent of the respondents on the largest vessels, 74 percent on the smallest vessels, and 62 percent on the second smallest. In northwest Russia, 50 percent of the respondents gave a "neither agree nor disagree" answer, while 43 percent stated that waste management options in harbors are insufficient.

Respondents could provide additional comments in the questionnaire, using free-format answers. Thirty-five respondents in Norway provided additional comments; none of the respondents in northwest Russia did. These comments were used to add qualitative information to the discussion. Some respondents in Norway also used this option to suggest how waste deliverance could improve.

Table 11 presents the respondents' answers regarding their belief whether fishers in general dump plastic waste at sea. The respondents placed themselves on the 5-point scale from "agree fully" to "completely disagree" with the statement "In general, fishers do not dump plastic waste at sea." Thirty-one percent of the respondents in Norway and 7 percent of the respondents in northwest Russia either completely or somewhat disagreed that fishers in general tend to dump plastic waste at sea. Most respondents to

Table 9. I do not deliver fishing gear for recycling, as there is no return deposit for fishing gear, Norway and northwest Russia.

Scale	Norway (*N*)	Norway (%)	Russia (*N*)	Russia (%)
Agree fully	33	20	5	17
Somewhat agree	21	13	2	7
Neither agree nor disagree	19	12	19	63
Somewhat disagree	9	6	3	10
Completely disagree	80	49	1	3
Total	162	100	30	100

Table 10. There are insufficient waste management options in fishing harbors, Norway and northwest Russia.

Scale	Norway (*N*)	Norway (%)	Russia (*N*)	Russia (%)
Agree fully	58	36	13	43
Somewhat agree	55	34	1	3
Neither agree nor disagree	25	15	15	50
Somewhat disagree	11	7	1	3
Completely disagree	13	8	0	0
Total	162	100	30	∼100

Table 11. In general, fishers do not dump plastic waste at sea, Norway and northwest Russia.

Scale	Norway (*N*)	Norway (%)	Russia (*N*)	Russia (%)
Agree fully	38	23	23	77
Somewhat agree	51	30	3	10
Neither agree nor disagree	27	16	2	7
Somewhat disagree	37	22	2	7
Completely disagree	15	9	0	0
Total	168	∼100	30	∼100

this statement, however, are of the opinion that fishers do not dump plastic waste at sea.

Discussion

Situation in Harbors

The legislation in Norway is unequivocal on the responsibilities of port operators and ships calling at ports. However, practices in harbors are not always in accordance with the legislation. Lack of implementation and enforcement of the PRF Directive is a challenge for vessel and port operators, county governors, and the Norwegian Maritime Authority. This challenge is evident from the 2010 European Maritime Safety Agency (EMSA) evaluation of Norwegian fishing harbors,[106] the ruling regarding Norway by the European Free Trade Association (EFTA) Court in 2016,[107] and a 2015 study conducted by the European Commission.[108]

[106] European Maritime Safey Agency (EMSA), *Chronological List of Visits to Member States Concerning Directive 2000/59/EC on Port Reception Facilities* (2016) at: http://emsa.europa.eu/visits-to-member-states/port-reception-facilities.html (accessed 20 May 2018).

[107] EFTA Court. Judgement of the Court, Case E-35/15 (2016), 717 at: https://report.eftacourt.int/2016/e3515 (accessed 20 May 2018).

[108] European Commission, *Ex-post evaluation of Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues* (Brussels, 2015) at: https://transport.ec.europa.eu/system/files/2016-09/2015-ex-post-evaluation-of-dir-2000-59ec.pdf (accessed 20 May 2018).

The 2010 EMSA evaluation documented that many Norwegian fishing ports did not have waste management infrastructure in place and even more lacked appropriate management plans. After the 2010 EMSA evaluation, Norwegian regulations were tightened, and all ports were required to present port waste management plans to the county governor by 1 July 2014.[109] However, the 2015 EFTA Court judgment merely reiterated the deficiencies, stressing that a result "cannot be satisfied merely by the creation of an appropriate regulatory framework."[110] The EFTA Court judgment stated that of 4443 ports identified in Norway, 1514 had submitted a waste reception and handling plan.[111] With respect to the number of ports in Norway, the Coastal Authorities of Norway provide a different estimate than the EFTA Court, indicating discrepancies in the counting of ports between authorities.[112] Regardless of that, the EFTA Court judgment strongly implies that county governors of Norway and port operators still have a long way to go to ensure that port regulations are met.

Furthermore, a study from the OSPAR Commission revealed that hardly any proceedings had been initiated by Norwegian authorities to enforce notification and waste delivery requirements, notwithstanding a significant percentage of noncompliant ships, indicating a lack of enforcement from port state control authorities.[113] The lack of enforcement of waste management regulations is reflected in the responses from the survey participants in Norway. Thirty-six percent agreed fully and 34 percent agreed somewhat that there are insufficient waste management options in fishing harbors. In addition, some respondents used the free-answer option of the questionnaire to comment on the lack of predictable waste delivery infrastructure in fishing harbors.

In the legal framework applied to fishing harbors in Russia, fishing vessels must register deliveries of waste, including plastics, to reception facilities in ports, as covered by the 2001 Order of the State Committee on Fisheries of Russia. While legislation regulates the duty of fishing harbors to facilitate waste and litter delivery by vessels in harbors of both countries, our results indicate some lack of compliance in northwest Russia, as in Norway, on the part of both the authorities that are responsible for implementation, and fishing industry actors who contribute to marine plastic pollution.

Our survey indicates that there are insufficient waste management options in fishing harbors serving smaller vessels. There are differences in the questionnaire responses based on vessel size, and it would appear that respondents on larger vessels act in accordance with laws related to waste and littering to a greater extent than respondents on smaller vessels. This may reflect that respondents on larger vessels are better informed and prepared in relation to waste management. In addition, the results may also reflect overall better waste management facilities in harbors for the largest vessels. This is supported by a study where interviewed fishers in Nordland County in northern

[109] Johannes Abildsnes, *Marine Littering in Finnmark vs the County Governor*. The North Calotte seminar on marine littering (Bodø, 23–24 August 2015) at: https://www.statsforvalteren.no/siteassets/fm-nordland/dokument-fmno/miljo-og-klima-dokumenter/barents-og-nordkalott/presentation-finnmark.pdf (accessed 20 September 2020).
[110] EFTA Court, note 107, 719.
[111] Ibid, 733.
[112] BarentsWatch. Havnestrukturen i Norge, (2016) at: https://www.barentswatch.no/artikler/havnestrukturen-i-norge (accessed 13 October 2022).
[113] OSPAR Commission, *OSPAR Regional Action Plan Marine Litter. Background Document on Sanctions, Penalties and Fines Issued by OSPAR and HELCOM Contracting Parties For Waste Disposal Offences at Sea. Actions 32, 33 and 38* (2021) at: https://www.ospar.org/documents?v=46419 (accessed 30 March 2022).

Norway perceived small harbors attending to coastal vessels as having deficient waste reception facilities compared with harbors for larger vessels.[114] Fishers who participated in the study had observed that smaller harbors usually offer fewer options for delivering and managing waste, with many often lacking any facility for this purpose. Furthermore, the Fishing for Litter program addresses larger fishing vessels, which are serviced by well-equipped harbors.[115]

The participants in the above-mentioned study in Nordland County saw it as the authorities' responsibility, and failure, to facilitate infrastructure for the disposal of used fishing gear.[116] These perceptions were echoed in our survey by some of the respondents in Norway, pointing to the lack of waste deliverance options in small harbors. Norwegian media reports similar findings.[117] In addition, international studies trace marine plastic litter back to land-based sources associated with deficient waste management systems.[118] Accessibility to waste management facilities was highlighted by some respondents. One respondent suggested making waste deposit easier: "Regarding deliverance of waste on shore, it must be made easier in some harbors. In [name of the harbor], you must rent whole containers only for a few bags of waste … It is made easy in harbors with containers with code locks, we open them and toss whatever we have." The cost of using waste infrastructure was also mentioned by some, calling upon the fishers' organizations to act: "The organizations should work towards the authorities to achieve free-of-charge delivery of normal waste volumes in Norwegian harbors. Far too often, we experience too much fuss to get access to a container for waste delivery."

In summary, the legal framework regulating waste reception facilities in harbors is largely in place, but the lack of implementation and enforcement of the PRF Directive continues to set a challenge for vessels. Port operators, the Norwegian Maritime Authority, county governors, and municipalities are all responsible for ensuring that port obligations are met by port operators and ships to avoid unintentional marine pollution.

To support fishing activities without littering, fishing industry actors' and port operators' compliance with legislation must be strengthened. To achieve that, it is crucial that both county governors and the Norwegian Maritime Authority fulfill their responsibilities under the PRF and PSC Directives to ensure their effective enforcement in Norway and create adequate conditions in ports to facilitate waste delivery.

Situation on Vessels

The results from the survey strongly indicate that laws and regulations play an important role in preventing plastic waste being thrown overboard. The results indicate lower

[114] Olsen, Nogueira, Normann et al., note 5, 5.
[115] Johnsen, Johannessen, Roland et al., note 55, 10.
[116] Olsen, Nogueira, Normann et al., note 5, 6.
[117] Lena Jørgensen, "Fiskerne har ingen plass å kaste søppel/Fishers has nowhere to deposit waste" October 11 2018, *Frøya nyheter* at: www.froya.no (accessed 11 October 2018).
[118] Jenna R. Jambeck, Roland Geyer, Chris Wilcox, et al., "Marine Pollution. Plastic Waste Input From Land Into the Ocean" (2015) 347 *Science* 768.

compliance with laws and regulations among survey respondents in northwest Russia compared to survey respondents in Norway.

Most survey respondents agreed with the statement "In general, fishers do not dump plastic waste at sea" (Table 11). This may be contrasted with respondents' replies to the question of what they intentionally throw overboard vessels they are working on (Table 6), which demonstrates that nearly 50 percent of the respondents in both Norway and northwest Russia identified a long list of such items. The most commonly discarded items as indicated by respondents in Norway were ropes and wires, followed by household products and strapping bands, and by respondents in northwest Russia, the most common items were strapping bands, followed by household products, ropes, and wires. This corresponds to analyses of plastic waste found during beach cleaning projects in northern Norway and the Svalbard region.[119] A study by the independent research and advisory company SALT, which specializes in marine pollution, marine management, and coastal development, demonstrates a correlation between the nationality of household-related litter that has found its way to beaches in northern Norway and the nationalities of vessels operating in adjacent waters. Beach litter analyses in northern Norway show that Russian and Norwegian household items dominate the waste found, indicating that a large share of stranded household-related litter has been lost or discarded from vessels.[120]

For both countries, items thrown or lost overboard overwhelmingly relate to fishing activities, from fishing operations (ropes, wires) to packing and storing (strapping bands). Arguably, items directly related to fishing operations are more susceptible to being lost in heavy weather, while the acts of discarding household products to a larger extent demonstrate neglect.

Among the study's respondents in Norway, 85 percent indicated, by answering agreefully or somewhat agree, that they do not throw plastic waste overboard (Table 3), while only 51 percent stated that items are never intentionally discarded from the vessel into the sea (Table 6). This is a gap that can be interpreted in several ways. One interpretation is that respondents distinguish between unintentional and intentional discarding of plastic waste. Another interpretation is that respondents blame others on their vessel, or on other vessels, for the illegal action. Among the respondents in northwest Russia, there is a similar gap. These results indicate that compliance with the law is inadequate in both countries. This is highlighted by the respondents in Norway's low agreement with the statement in Table 11 that fishers in general do not dump plastic waste at sea (22 percent somewhat disagree, 9 percent completely disagree), in contrast with the relatively high agreement among respondents in northwest Russia (77 percent agree fully, 10 percent agree somewhat).

Pollution from vessels can potentially give rise to international responsibility of states pursuant to their obligations under the UNCLOS and MARPOL Annex V. If dumping waste into the ocean is due to a lack of facilities or practical solutions, it could, for example, be dealt with by improving infrastructure around waste disposal. A study of attitudes toward waste management in small Nordic communities found that a public mandatory waste management scheme had a significant educational effect.[121] The study

[119] Nashoug, note 16, 12.
[120] Haarr and Falk-Andersson, note 18, 29.
[121] Jan Høst, *Holdninger til avfallshåndtering i nordiske småsamfunn/Attitudes Toward Waste Management in Nordic Small Communities* (Nordic Council of Ministers, Copenhagen, 1999) at: www.norden.org (accessed 8 November 2022).

showed that practical solutions eventually overcame ingrained objections and led to changing behavior toward waste management. In the Nordic countries (Norway, Sweden, Denmark, Finland, and Iceland), there is increasing agreement among authorities, the private industry, and researchers that awareness campaigns and education programs directed at, inter alia, the fishing and aquaculture industries and the public are key both to cleanup activities and to preventing littering in the first place. Awareness making must be repetitive.[122]

Previous research indicates that collecting and storing large pieces of marine litter is more difficult for smaller vessels compared to larger vessels owing to space and capacity.[123] A respondent in Norway who worked on oceangoing vessels nevertheless expressed that "the coastal fleet should have the same requirements for waste management [on board] as us in the oceangoing fleet." Vessels' ability to deliver gear in harbors is related to their storage capacities. But irrespective of storage capacity, respondents in our survey were overwhelmingly of the opinion that practical, predictable waste management facilities are deficient, presenting challenges for the delivery and sorting of fishing gear, waste, and litter.

In addition, there are gaps in laws and other measures regulating marine pollution and dumping. This article has demonstrated that the obligations under UNCLOS and MARPOL Annex V vary in specificity. The general obligations on states in UNCLOS to prevent marine pollution are made more specific through MARPOL Annex V, which sets out detailed obligations on individual actors, such as waste management plans and waste recordkeeping. However, many vessels are not covered by Annex V of MARPOL, so that the problem could lie in the gap in international law, and that may be the main challenge for future management of marine plastic pollution. The exemptions for smaller fishing vessels in international standards mean that a large share of the respondents in Norway are not targeted to the same extent as oceangoing fishing vessels. Respondents in northwest Russia, on the other hand, are targeted since they operate on overall larger oceangoing vessels. Furthermore, despite international awareness campaigns having positive impacts, problems of compliance persist, and states have limited leeway to control behavior of individual actors. This aggregates a lack of sufficient domestic implementation of the international regulatory framework, by either a lack of targeted regulation or inadequate enforcement, as well as a failure to provide relevant waste management infrastructure guidelines and appropriate waste disposal facilities in ports.

Conclusions

This article has mapped the legal framework for regulating marine waste from fishing industry actors from Norway and northwest Russia operating in the Barents Sea. Through a survey addressing fishing industry actors in both countries operating in the

[122] Gjermund Langedal, Bård Aarbakke, Finn Larsen, et al., *Clean Nordic Oceans Main Report—A Network to Reduce Marine Litter and Ghost Fishing* (Nordisk Ministerråd, 2020) at: https://www.norden.org/en/publication/clean-nordic-oceans-main-report-network-reduce-marine-litter-and-ghost-fishing (accessed 3 June 2021); Clean Nordic Ocean. CNO Final Conference—The Nordic Challenge and Solutions at: www.cnogear.org (accessed 10 December 2019).

[123] Olsen, Nogueira, Normann, et al., note 5, 5.

Barents Sea, we have presented findings that seek to bridge the information gap between law, compliance, and practice on fishing vessels and in harbors.

Our review has demonstrated that there are no legal rules or regulations that specifically target waste management on fishing vessels and in fishing harbors in the Barents Sea area or in the Arctic. The current situation comprises a legal patchwork of rules, with waste management on fishing vessels and in harbors regulated through a combination of rules and regulations at the international, regional, national, and subnational levels. The need for harmonization of the different regulations and initiatives is being addressed at the international level, mainly through resolution 5/14, whereby UNEA-5.2 requested the UNEP Executive Director to convene an intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution. Input from industry actors is demanded and recognized in this process.

Many of the environmental law obligations are obligations of conduct, not result. This means that states must exercise due diligence in taking measures and assuming responsibility in developing the framework for individual actors, by developing regulatory frameworks and infrastructure in ports and onboard vessels. For the rules to have legitimacy and impact however, necessary enforcement measures need to be adopted. This is mutually dependent on sufficient implementation, which is also a part of due diligence. This has limits, as it is difficult to expect states to be able to fully control fishing industry actors' conduct and practices.

Our survey results indicate deficiencies in the waste management facilities on vessels, particularly coastal vessels, and in harbors, and a lack of compliance by vessels. Reasons for the lack of compliance may relate to the available infrastructure, as compliance to a large extent depends on the infrastructure in place.[124] Insufficient facilities in harbors may hinder fishing industry actors' abilities to comply with waste management regulations, forcing them to discard waste before reaching the shore.

We believe that both knowledge of the applicable legal framework and willingness to comply with that framework are currently insufficient, but with increasing international attention on marine plastic pollution, a larger share of relevant, crucial actors are being informed about the importance of not polluting the ocean during fishing operations. Our study suggests that the main measure to combat marine plastic pollution from fishing activities is to establish adequate waste management in all harbors. Our findings support the EFTA Court evaluation of Norway, which highlighted the need for progress on formal plans for adequate and mandatory waste management facilities in fishing harbors. Our study supports the need to refine and strengthen the impact of legislation relating to adequate waste reception facilities in harbors, the implementation of regulations, and the need to strengthen the enforcement of legislation relating to waste reception facilities.

Onboard vessels, the reasons for intentionally discarding plastic waste appear to be more complex. Although adhering to the law is reported to be a reason for not throwing plastic waste overboard, the existence of laws nevertheless appears to be insufficient in preventing littering. Lack of space onboard may be a problem on Russian vessels, according to the survey results. This may seem somewhat puzzling, as the vessels of

[124] Høst, note 121.

respondents in northwest Russia were mainly oceangoing vessels of more than 28 meters, and hence, there arguably should be space for storing and managing waste. This question should be addressed through further research.

Our study had limitations. One was the low number of respondents. Another was that even though respondents in northwest Russia were assured that they would be kept anonymous, there was a basis for their concerns about confidentiality, since they were contacted by e-mail or phone. This may explain why the option of answering "neither agree nor disagree" in the survey was chosen more often by the respondents in northwest Russia than by the respondents in Norway. This is a limitation on the validity of the results. Nevertheless, to our knowledge, this survey is the first attempt to understand the factors influencing marine plastic pollution in the Barents Sea region, based on first-hand input from fishing industry actors with day-to-day experience of waste management, in the context of the legal framework. It is our hope that future research in this direction will bring us closer to finding a solution to and appropriate measures for the marine plastic pollution problem.

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