Maritime Studies (2026) 25:14
https://doi.org/10.1007/s40152-026-00479-8

RESEARCH

All caught up? Entangled in power, politics, and plastics: the case of abandoned, lost, or otherwise discarded fishing gear in the Baltic Sea

Ben Boteler[1,2] · Judith van Leeuwen[1] · Luke Dodd[3] · Tiffany H. Morrison[1,4,5] · Cristian Passarello[2]

Received: 7 October 2025 / Accepted: 24 January 2026

Abstract
Abandoned, Lost, or otherwise Discarded Fishing Gear (ALDFG) contributes to marine plastic pollution, negatively impacting marine habitats and wildlife, and posing risks to human activities (e.g. tourism, maritime transport). To date, research has primarily focused on understanding and classifying types of ALDFG; investigating its impacts on the marine environment; or exploring potential management approaches to address it. Few studies focus on the complex governance of ALDFG, more particularly how power shapes actors' interactions and collaborations across governance levels (e.g. regional and EU) and sectors (e.g. fisheries and waste management) to mitigate ALDFG. Through case analysis of ALDFG in the Baltic Sea as a Collaborative Governance Regime (CGR), we identify several governance challenges resulting from the interface between power and collaboration. First, multi-level governance causes power asymmetries that hinder capacity for joint action amongst actors at the regional level. Second, policy gaps create power vacuums that limit principled engagement from key actors. Finally, shared discourses lead to powerful regional narratives that weaken shared motivation and capacity for joint action between actors to address common challenges. By synthesizing theories of collaborative governance with power and testing this synthesis in the Baltic Sea region, we address both a gap in the literature on CGRs and identify opportunities that improve governance to mitigate ALDFG.

Keywords Baltic Sea · Collaboration · Fishing gear · Governance · Plastic pollution · Power

Introduction

The damaging effect of Abandoned, Lost, or Otherwise Discarded Fishing Gear (ALDFG) has been recognised since the 1960 s and clearly established as an issue of global environmental concern since the 1980 s (Phillips 2017). Since these early years, synthetic plastic fibres began to replace natural materials (e.g. cotton, flax, or hemp) in fishing gear from the 1960 s onwards, and plastics today account for the vast majority of materials used in commercial fishing gear (Ramos et al. 2025). The damaging effects of plastics on the planet and human health have been witnessed since the 1970 s, yet continue to worsen, driven by increasing annual production of global plastics (Landrigan 2025). While estimates of fishing gear entering the ocean do exist (Mayfadyen et al. 2009; Richardson et al. 2022), recent findings identify clear challenges with and misinterpretations of these calculations (Richardson et al. 2021). More recent estimates show that nearly two per cent of all fishing gear, accounting for 2963 km2 of gillnets, 75,049 km2 of purse seine nets, 218 km2 of trawl nets, 739,583 km of longline mainlines, and more than 25 million pots and traps, is lost each year in the ocean (Richardson et al. 2022). Of total plastic pollution in the ocean, 18 per cent is estimated as coming from fishing activities (Lebreton et al. 2018).

ALDFG, and plastic pollution more broadly, negatively impacts marine habitats and wildlife (e.g. mammals, birds) as well as poses significant risks to human activities (e.g.

✉ Ben Boteler
benjamin.boteler@wur.nl

1 Wageningen University, Environmental Policy Group, Wageningen, The Netherlands

2 Research Institute for Sustainability (RIFS) at GFZ Potsdam, Potsdam, Germany

3 HELCOM Baltic Marine Environment Protection Commission, Helsinki, Finland

4 School of Geography, Earth and Atmospheric Sciences, University of Melbourne, Melbourne, VIC, Australia

5 College of Science and Engineering, James Cook University, Townsville QLD, Australia

Published online: 11 February 2026

maritime transport) (Environmental Investigation Agency 2023). For example, pollution is a source of chemicals released from litter into water (Unsbo et al. 2023), while litter can lead to animals misidentifying smaller objects for food or becoming entangled in larger objects, such as fishing nets and lines (Kammann et al. 2023). Beyond environmental impacts, a number of social and economic costs (e.g. lost revenue, health impacts) are associated with ALDFG (Giskes et al. 2022). Various factors contribute to fishing gear becoming ALDFG, such as adverse weather conditions, gear conflicts, cost of gear retrieval, vandalism and theft, as well as illegal and unregulated fishing activities and intentional dumping of gear (Mayfadyen et al. 2009).

Despite increasing awareness of the consequences of marine plastic pollution on the marine environment (Krajnc et al. 2022), the challenge of ALDFG persists, including both newly entering gear but also gear that has been in the sea for decades. This is also the case for the Baltic Sea (Tschernij 2019; Rijkure et al. 2024), even though fishing has been declining since the 'cod-boom' of the 1990 sand exact amounts of ALDFG for the Baltic Sea are not known (Stolte et al. 2022). Early responses to ALDFG are found in the UN Food and Agriculture Organization's (FAO) 1995 Code of Conduct For Responsible Fisheries, which includes provisions to minimise the impact of ALDFG on the marine environment. Today numerous international (e.g. FAO Guidelines), EU (e.g. Single-Use Plastics Directive), and sea-basin level (e.g. HELCOM Revised Regional Action Plan on Marine Litter) instruments exist, which provide a basis for tackling ALDFG.

In addition, actors involved in ALDFG governance in the Baltic Sea include fisheries, regional bodies (especially the Helsinki Commission (HELCOM), ports, national authorities, EU bodies, NGOs as well as those who are less engaged in regional level policy debates such as gear producers. Despite these efforts, an agreed approach on how to best address ALDFG and what action(s) to take within the region remains open. There is consensus that prevention (i.e. no new ALDFG entering the Baltic Sea) is essential, however there is less agreement regarding mitigation of impacts (e.g. use of alternative materials), and gear retrieval. This is partially due to concerns with causing additional environmental impacts combined with safety issues. So while ALDFG has been on the collective 'radar' for decades, the region remains at a crossroads regarding how to best address this challenge with a number of options e.g. prevention, mitigation, and retrieval being debated.

More broadly, the Baltic Sea region is characterised by a high number of actors across governance levels and policy sectors (Gänzle 2018), and some scholars argue that the existing Baltic Sea governance regime is 'ill-equipped' to address complex governance challenges (Boström et al. 2016; Grönholm 2018). Challenges are often addressed through sector-specific regimes within the Baltic Sea region, with institutions failing to take an integrated, cross-sectoral approach to management (Boström et al. 2016; Grönholm 2018). Furthermore, policy making is often guided by short-term projects as opposed to long-term regional policy objectives, hampering efforts by actors to collaborate and coordinate shared governance challenges (Grönholm 2018).

According to Emerson et al. (2012) collaboration, or collaborative governance, is the "processes and structures of public policy decision-making and management "where actors and institutions engage in collective action towards a public purpose. Collaborative governance focuses on decision-making processes to overcome joint problems, where actors work together to develop mutually beneficial outcomes (Gerlak et al. 2013). While collaborative governance is often studied by considering the dynamics of collaboration, power is often excluded from collaborative practice (Purdy 2012). Yet, power is embedded within all governance structures, leading to policy outcomes not being based on equality and fairness, but on more powerful actors receiving more favourable outcomes than less powerful actors (Morrison et al. 2019). Power complicates collaborative governance dynamics, but the connection between power and collaboration is still not well understood.

In order to understand why ALDFG governance within the Baltic Sea region is stalling, this research paper aims to answer the following research question: how do power relations affect the collaborative dynamics within ALDFG governance in the Baltic Sea region? To answer this question the paper will first introduce the theoretical approach applied in this paper, building on and synthesising concepts of collaborative governance and power (in section two). Section three presents the methodological approach to the case study and explains the use of stakeholder interviews and workshops to collect data. The analysis focuses on the intersection of power and collaborative dynamics in ALDFG governance in the Baltic Sea, highlighting both barriers and enablers found at this nexus (section four). Several themes that emerge from the analysis, including the role of multi-level governance, gaps in governance and the creation of power vacuums, and the role of discourse and the power of regional narratives, along with a reflection on opportunities for enhancing governance, are discussed in section five. Finally, section six offers a conclusion and outlook, taking a look at relevant lessons regarding the theories underpinning this paper as well as ideas for future research.

Theoretical approach

Understanding collaborative dynamics in collaborative governance

Collaborative governance is, broadly speaking, a mode of governance which brings together diverse stakeholders around a joint problem to engage in 'consensus-based decision making' (Ansell and Gash 2008). Ansell and Gash (2008) reviewed 137 cases of collaborative governance across a number of sectors. Based on this review, they provide a model to study collaborative governance built upon four main variables: starting conditions, institutional design, leadership, and collaborative process. Building on these variables, Emerson et al. (2012) propose an integrative framework for studying collaborative governance. The framework includes three types of collaboration dynamics, namely: principled engagement, shared motivation, and capacity for joint action (see Table 1).

These three types of dynamics work together in an "interactive and iterative way to produce collaborative actions" which could not be attained with one organisation acting alone (Emerson et al. 2012). Collaboration takes place within the Collaborative Governance Regime (CGR), which refers to 'a system of public decision making in which cross-boundary collaboration represents the prevailing behaviour and activity' (Emerson and Nabatchi 2015, p. 10 cited in Nohrstedt 2016). The CGR is in turn embedded in the system context, i.e. a multi-layered context of political, legal, socio-economic, environmental, and other influences (Emerson et al. 2012). System contextual conditions drive and affect the CGR, while the actions and collaborations within the CGR can lead to changes in the system (Avoyan et al. 2017).

The power gap in collaborative governance regimes

Emerson et al. (2012) point out that power, including the combined power of participants, can both enable or disable action within collective governance. In other words, power is a key factor affecting the likelihood of collaborative action (Purdy 2012). However, power can be difficult to identify and study, as it is often unobservable (Lukes 2006).

Table 1 Collaboration dynamics based on Emerson et al. (2012)

Collaboration dynamics	Description
Principled engagement	Actors work across their respective institutional, sectoral, or jurisdictional boundaries to solve problems, resolve conflicts, or create value. Together they discover, define, deliberate and determine joint action.
Shared motivation	A self-reinforcing cycle between actors consisting of four elements: mutual trust, understanding, internal legitimacy, and commitment.
Capacity for joint action	Engaging in cooperative activities to enhance the capacity of both self and others to achieve a common purpose. Such action is based on procedural and institutional arrangements, leadership, knowledge and other resources.

Numerous studies and typologies for power exist. Purdy (2012) focuses on 'processes' and 'arenas' for classifying and assessing power within collaborative governance, in particular to identify the sources and the dynamics of power as well as how relational power changes over time. Haugaard (2003) proposes that (social) power stems from the reproduction of social order or from coercion, while social order is more important in modern societies. Morrison et al. (2019) identify three main types of power focusing on centres of authority within polycentric governance systems: designing rules and incentives; pragmatic interpretation and implementation of rules; and framing problems, setting norms, and influencing discourses. McIlwain et al. (2023) conducted a review of power in water governance and highlight the importance of power for influencing governance structures, stakeholder relationships, and governance processes and outcomes.

What is common across these typologies is the acknowledgement that power stems from social interactions, and the order which this creates. Considering this, we adopt the approach of Barnett and Duvall (2005) who argue that power comes in and through social relations, affecting the capacities of actors to achieve their goals. This approach is useful because it provides a framework for power embedded in the social relations of actors through societal, structures and discourses, and is not controlled by any actor or actors. Their framework for understanding power is based on two dimensions: "(1) the kinds of social relations through which actors' capacities are affected (and effected); and, (2) the specificity of those social relations". Based on these two dimensions, they offer a taxonomy of four types of power: compulsory, institutional, structural, and productive (see Fig. 1).

Compulsory power exists in the direct control of one actor over the conditions of existence and/or the actions of another. *Institutional power* exists in actors' indirect control over the conditions of action of socially distant others. *Structural power* operates as the constitutive relations of a direct and specific – hence, mutually constituting - kind. *Productive power* works through diffuse constitutive relations to produce the situated social capacities of actors. Applying this structure to the idea of power helps to identify power dynamics at play within the CGR, otherwise not recognised or understood. It should be noted that these four types of power are not exclusive, nor static. It is possible to identify power which fits into multiple categories (e.g. capital (structural) influences institutions (institutional), and that these interactions can shape and lead to new forms of power.

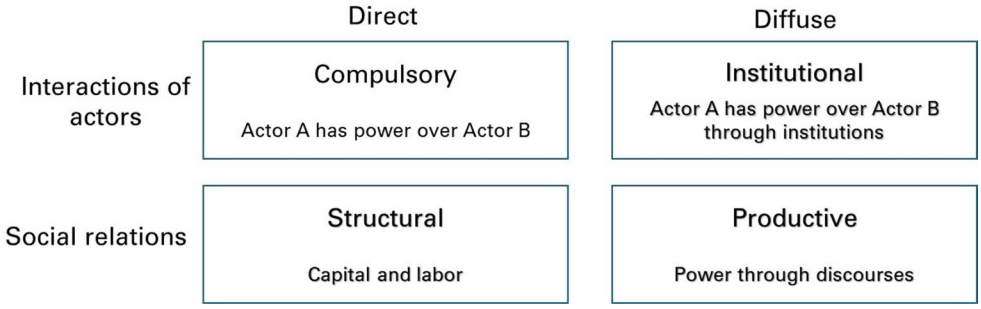

Fig. 1 Taxonomy of power based on Barnett and Duvall (2005)

Based on the taxonomy from Barnett and Duvall (2005) a number of examples can be useful to consider across the four types of power (see Table 2).

Case study methodology

The research design used in this study is that of a case study, with the aim of conducting an analysis of both 'the context and processes which illuminate the theoretical issues being studied' (Harley, 2004). The case study focuses on power related to the collaborative dynamics in ALDFG governance in the Baltic Sea region. While the definition of the Baltic Sea's borders varies, this study applied the HELCOM[1] definition, which excludes the Norwegian region of Skagerrak. The nine coastal Baltic Sea countries are therefore Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Russia, Poland, and Sweden. The EU is the tenth and final Contracting Party to the Helsinki Convention (HELCOM, n.d.). In addition, while both recreational and commercial fishing activities contribute to ALDFG in the Baltic Sea region, this paper focuses on commercial fishing.

Inspired by Batory and Svensson (2019), who argue that it matters whether collaborative governance itself is defined in more narrow or diffuse ways, we consider five dimensions (participation, agency, inclusiveness, scope and normative assumptions) in defining the CGR around ALDFG governance in the Baltic Sea. The study focuses on the collaboration between state and non-state actors within the Regional Sea Convention of the Helsinki Convention (HELCOM), within which the HELCOM (Revised) Regional Action Plan on Marine Litter was initiated in 2020 and adopted in 2021. While both international and national level actors have a role in ALDFG governance, they are not included in the CGR studied here, as their role is limited. The time frame of the study is five years (2020 to 2025), which reflects the time since the (Revised) Regional Action Plan on Marine Litter was initiated and implemented. Agents driving

Table 2 Examples of power based on Barnett and Duvall (2005)

Power	Examples
Compulsory power	• Actors can use their control over capital (e.g. financial resources) to shape policies (e.g. through lobbying). • Actors can use normative resources to compel targeted actors (e.g. states) to alter their policies through a strategy of shaming. • Actors can use symbolic gestures (e.g. high-level meetings) to influence the actions of other actors (e.g. states). • Less powerful actors can use legal norms (e.g. court proceedings) to restrain the actions of the more powerful. • Actors can use their expert, moral, delegated, and rational legal-authority as a resource to compel actors (e.g. states) to change their behaviour.
Institutional power	• Actors shape the agenda-setting process through institutional arrangements, and can prioritise or eliminate issues, including those that are points of conflict. • Institutional rules establish who can participate in policy processes, potentially creating unequal leverage in who can influence outcomes.
Structural power	• Rules, procedures, and norms can constrain the action of actors with fixed preferences. • Access to resources (e.g. capital, labour) creates asymmetric privileges that affect the interests of actors.
Productive power	• The social processes and systems of knowledge through which meaning is produced, fixed, lived, experienced, and transformed influence actors and their activities. • Discursive processes and practices which produce social identities and capacities influence actors and their activities.

[1] The Helsinki Convention, also known as the Convention on the Protection of the Marine Environment of the Baltic Sea Area, aims to protect the Baltic Sea from human-made environmental challenges. It also covers the inland waters and the sea bed of HELCOM's Contracting Parties (HELCOM, n.d.).

this process are a combination of the HELCOM Secretariat and the HELCOM Contracting Parties (i.e. Member States).

To understand the governance of ALDFG in the Baltic Sea region, we undertook semi-structured interviews with 14 stakeholders from the Baltic Sea region, coming from government bodies (e.g. national ministries, agencies) (labelled as Government 1–5), the private sector (labelled as Private 1 and 2), regional authorities (labelled as Regional 1 and 2), civil society (i.e. NGOs) (labelled as NGO 1–4) and research institutions (labelled as Research 1). Interviews took place between August and October 2024. This sample of participants was selected based on their relevance to the planned research. Prior to the interviews, participants were provided with a written introduction to the case study and an outline of the questions to be discussed. The interviews built upon an initial desk-based study to collect broad information for characterising the issue area. The participants provided written consent, agreeing to the interviews and remaining anonymous.

Using a spreadsheet, the findings from the interviews were collated and synthesised to enable a thematic analysis of the qualitative data and identify emerging themes based on the concepts of the theoretical framework (i.e. collaboration dynamics and types of power). To validate the thematic analysis, the preliminary results were summarised and shared with interviewees and additional regional stakeholders to collect their written feedback and suggestions. In addition, in May 2025, summarised results were presented and discussed with two regular HELCOM Working Groups meetings to discuss potential management options to address ALDFG. The desk-based study, combined with the interview results, written feedback, and workshop participation allowed for triangulation of the qualitative data collected. In addition, close collaboration with the 'end-user' (HELCOM Secretariat) helped to ensure that findings throughout the research process remained grounded in relevant regional discussions.

Results: Power and collaboration in ALDFG governance in the Baltic Sea

The collaborative governance regime of ALDFG in the Baltic Sea

The CGR of ALDFG in the Baltic Sea is shaped by a multi-layered, legal system context consisting of a number of policies (see Table 3). A number of EU policies touch upon ALDFG in various ways, such as focusing on the health of marine ecosystems (e.g. Marine Strategy Framework Directive (Directive 2008/56/EC), addressing plastic pollution (Single-Use Plastics Directive (Directive 2019/904), fishing activities (e.g. Common Fisheries Policy (European Parliament 2024), EU Marine Action Plan (European Commission 2023), Fisheries Control Regulation (Regulation (EU) 2023/2842), or waste management (e.g. Port Reception Facilities Directive (Directive 2019/883) and Waste Framework Directive (Directive 2008/98/EC). In addition, several 'high-level' EU strategies such as the Zero Pollution Action Plan (European Commission 2021) and the Circular Economy Action Plan (European Commission 2020) provide a strategic vision for addressing pollution and waste within the EU.

At the Baltic Sea level, these EU ambitions have been translated into regional goals and actions to address ALDFG and are captured in the HELCOM Revised Regional Action Plan on Marine Litter (HELCOM 2021a). At the international level, the FAO Code of Conduct of Responsible Fisheries (FAO, 1995) and the future Global Plastics Treaty, although still being negotiated, also play a role. These policies provide the 'rules of the game' which set the conditions for actors to collaborate within the CGR. Although no specific policy targeting ALDFG exists, together these policies provide a basis for addressing ALDFG within the EU and the Baltic Sea region and provide the context for collaborative processes between relevant actors.

Based on the review of policies addressing ALDFG in the Baltic Sea region, the primary actors relevant to the CGR are identified, and span the EU and regional (Baltic Sea) governance levels (see Fig. 2). At the EU level, the European Commission, and particularly the Directorate-General Maritime Affairs and Fisheries (DG MARE) and the Directorate-General for Environment (DG ENV) are key actors. DG MARE is responsible for developing and monitoring the Common Fisheries Policy and other EU fisheries policies, while DG ENV develops and implements policies focusing on the conservation and protection of ecosystems, such as the MSFD. At the regional level, HELCOM, including its Working Groups, is a central actor leading and coordinating ALDFG action through its Regional Action Plan on Marine Litter.

A number of other (sectoral) actors also participate in the CGR, spanning both the regional and EU governance levels (see Fig. 2). The fisheries sector is the primary driver of ALDFG. The sector is diverse, considering differences between national fleets, use of gear types, species targeted, etc. The Baltic Sea Advisory Council (BSAC) acts as a forum to bring together regional fishers and other stakeholders in providing advice to the EU on fishing-related topics. Fishing gear producers, importers, and sellers, are a heterogeneous group scattered across the globe, including within the EU and third countries. The value chain for fishing gear, and therefore the actors involved, is complex, ranging from companies who produce the raw materials for the products (i.e. plastic, metal), manufacturers of fishing gear, and importers, distributors and sellers. Ports are responsible for the collection and handling of ALDFG into appropriate waste and recycling streams. Baltic Sea ports range in size but also the sectors they support (e.g. shipping, ferries, fishing, and tourism). The

Table 3 Main policies (rules) addressing ALDFG in the Baltic Sea region

Policy	Description	Governance level
1995 The Code of Conduct for Responsible Fisheries	Encourages sustainable practices and gear selectivity to minimise ALDFG (FAO, 1995).	International
2008 Marine Strategy Framework Directive (MSFD)	Includes marine litter (Descriptor 10: marine litter does not cause harm) as one of its 11 descriptors of Good Environmental Status (GES). The MSFD is one of the primary tools employed by the EU to protect and conserve European seas and coasts (Directive 2008/56/EC).	EU
2008 EU Waste Framework Directive	Although not ALDFG-specific, it establishes the foundation of EU waste management and lays down preferences for managing and disposinnnng of waste (Directive 2008/98/EC).	EU
2008 The Common Fisheries Policy (CFP)	Establishes reporting requirements (e.g. position, type of gear, vessel, etc.) for ALDFG in the EU, while the EU Parliament has called for improved reporting of lost fishing gear, new tools for identifying and tracking lost fishing gear, more funding as well as more support to Member States through an EU action plan (European Parliament 2024).	EU
2019 Single-Use Plastic (SUP) Directive	Introduces the Extended Producer Responsibility (EPR) scheme for fishing and aquaculture gear used in both commercial and recreational settings. This scheme requires producers (manufacturers, sellers, and importers), to engage in the responsible management of plastic items and seeks to hold them accountable for the environmental impacts of their products throughout the product lifecycle (Directive 2019/904).	EU
2019 The revised Port Reception Facilities Directive	Aims to reduce waste discharge from ships at sea by enhancing port facilities and mandating waste delivery from all vessels regardless of their flags. It also mandates EU Member States to collect and report data on the volume and type of passively fished waste, including ALDFG. Critically, it introduces a cost recovery system to discourage the discharge of waste at sea by including the right to deliver any reasonable amount of MARPOL Annex V waste (including ALDFG) and all passively fished waste at no additional charge (Directive 2019/883).	EU
2019 The Technical Measures Regulation	While not directly addressing ALDFG, can influence gear choices by regulating gear types per fishing method. The regulation, although focused on sustainability, could support ALDFG prevention by promoting alternative gear types, provided economic feasibility is considered (Regulation (EU) 2019/1241).	EU
2020 Circular Economy Action Plan	Supports the EU's goal of achieving a Zero Pollution Ambition for a Toxic-free Environment and supports efforts to minimise waste through the reuse and recycling of products (European Commission 2020).	EU
2021 Zero Pollution Action Plan	Aims to significantly reduce pollution in the EU by 2050 and includes the targets of 50 per cent reduction in plastic litter at sea, 30 per cent reduction in microplastic released into the environment, and 50 per cent reduction of residual municipal waste by 2030 (European Commission 2021).	EU
2021 HELCOM Revised Regional Action Plan on Marine Litter	Introduces 10 targeted actions on ALDFG including guidelines for gear marking and design innovations, mapping and removal of ghost nets, public engagement in reporting lost gear, and the promotion of sustainability education among fishers (HELCOM 2021a). At the regional level, the Regional Action Plan reflects the broader Baltic Sea Action Plan (HELCOM 2021b). Regional Action Plans (recommendations from HELCOM) are the 'strongest' instrument within the HELCOM framework. The Revised Regional Action Plan supersedes HELCOM Recommendations 29−2 (adopted in March 2008) which draws attention to ALDFG amongst other types of marine litter and 36−1 (adopted in March 2015) which includes five actions for ALDFG.	Baltic Sea (regional)
2023 EU Marine Action Plan	Aims to protect and restore marine ecosystems for sustainable and resilient fisheries and promotes low impact gear and improved gear selectivity, directly targeting the reduction of ALDFG to protect marine ecosystems (European Commission 2023).	EU
2023 EU Fisheries Control Regulation	Establishes measures to monitor EU fishing activities requiring vessels to carry gear retrieval equipment and record information in their electronic logbooks (Regulation (EU) 2023/2842).	EU
Under negotiation Global Plastics Treaty	Emphasises the need for international cooperation to address plastic pollution. At present, there is no dedicated Article on fishing gear it remains under negotiation and is unclear whether such a focus will be included in the final treaty.	International

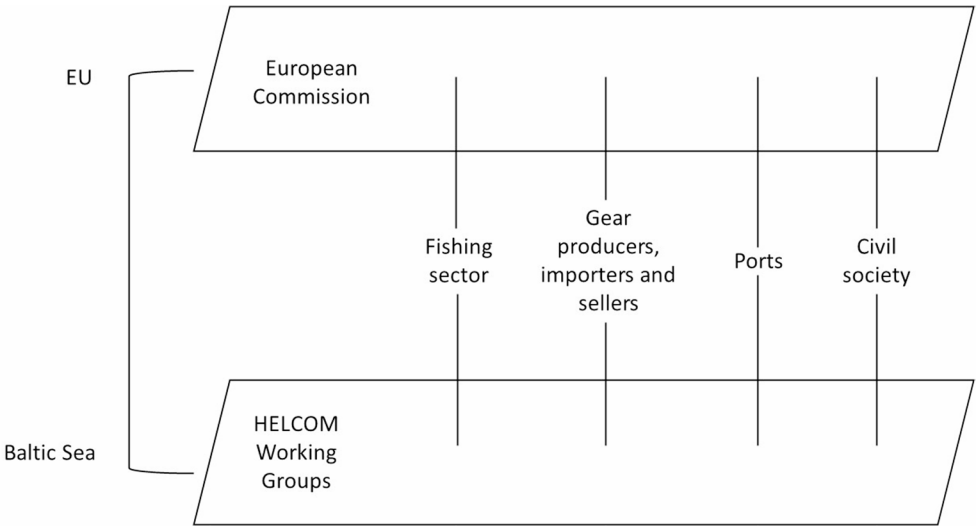

Fig. 2 Main sectoral actors involved in the multi-layered (EU and Baltic Sea) collaborative governance regime (CGR) addressing ALDFG in the Baltic Sea region

Baltic Ports Organisation (BPO) acts as a platform for members (ca. 50 ports) to contribute to the development of ports in the region regarding economic, social, and environmental aspects. NGOs and civil society organisations help to drive the Baltic Sea region to address ALDFG through campaigns and targeted policy engagement. NGOs are a diverse and variable group, ranging from global (Global Ghost Gear Initiative), to local (KIMO) to multi-level WWF (Germany, Sweden, Baltic, global). In addition, research and science play an advisory role, and a number of academic institutions and private organisations are working on different aspects of ALDFG in the region.

Collaboration

Collaboration centres around principled engagement, shared motivation, and capacity for joint action (Emerson et al. 2012) and are explored in this section. The interviews show that there is a variety of collaboration within the CGR and that actors, particularly those working on environmental issues, perceive collaboration to be 'working well'. This perception can be attributed to several observations. There is a shared understanding of the environmental impacts of ALDFG, including a level of trust amongst some key actors, and several platforms which provide actors a means to participate, namely HELCOM and BSAC. At the same time, some tensions and lack of trust between some actor groups exists and ALDFG governance in the Baltic Sea region is progressing slowly.

Principled engagement

Principled engagement entails actors working across institutional, sectoral, or jurisdictional divides to take joint action on common problems and support governance advancements (Emerson et al. 2012). Actors create value within the CGR, developing a shared purpose as well as a shared course of action to achieve that purpose (Emerson et al. 2012). Within the CGR of ALDFG governance in the Baltic Sea, there is a strong political hierarchy in the sense that EU law drives the political agenda. Member States and regional bodies (i.e. HELCOM, BSAC) are subsequently tasked with advising, coordinating, and/or implementing their efforts within the region (Regional 1 and 2; Government 1–5 2024). At the regional level, some actors point to ongoing collaboration not only between Member States and regional bodies, but also with additional actors such as industry actors, NGOs, and research organisations as a positive approach to address ALDFG (Regional 1 and 2; Government 1–5; Private 1 and 2 2024). On the other hand, others indicate that while collaboration does exist, it is often rather siloed within specific sectors or issues (e.g. fisheries, waste, environment) (Government 1; Research 1 2024). Moreover, there is no clear 'leader' within the region who brings together actors across all sectors or topics, although some Member States (e.g. Sweden, Germany) are seen as highly active on ALDFG (Government 2; Government 3; NGO 3; Research 1 2024).

There is a clear economic incentive for fishers to avoid gear loss, not just in terms of replacement but also in lost productivity (All interviews 2024). Because fishing gear is expensive, fishers have an incentive to care for it, meaning that when gear is lost, it is typically due to entanglement with rocks or shipwrecks, making retrieval difficult (All interviews 2024). This discourse is shared amongst actors and helps to establish shared interests (i.e. discovery of shared concerns) as well as establishing expectations (i.e. definition of a common purpose) within the CGR. This is important as fishers, are viewed within the CGR as somewhat willing to engage in ALDFG governance.

At the same time, some actors are concerned that fishers fail to report or underreport lost gear out of fear for future regulations, demonstrating mistrust of the sector (Research 1; Private 1 2024). Not only is principled engagement weakened if actors perceive fishers to be untrustworthy, it also limits knowledge

about the amount and location of ALDFG in the Baltic Sea, impeding shared motivation and capacity for joint action. Indeed, another common discourse is a concern about the lack of knowledge and understanding regarding the scope and impact of ALDFG, e.g., not knowing how many animals are caught in lost gear or how long gear remains in some locations (Research 1; Government 2; Government 3; Regional 1 and 2 2024). This discourse is shared by all actors, including the fisheries sector. While there is agreement, the lack of understanding the full scope of the challenge potentially impedes actors from defining a common course of action to address ALDFG (i.e. definition according to Emerson et al. 2012).

It is also suggested that lost gear, especially gill nets that are entangled with shipwrecks, are sometimes intentionally left at sea. This is because it can be dangerous and challenging, and thus costly, to retrieve them. Another reason is the belief that these gill nets can provide new habitats for fish (Research 1 2024). At the same time, it is politically attractive for politicians to demonstrate commitments to sustainability causes and 'clean up the Baltic' (NGO 2; NGO 3 2024). These views indicate how actors both agree, and differ, in what they regard as primary challenges in addressing ALDFG.

Shared motivation

Shared motivation is the social capital within a CGR and is the result of principled engagement and a step toward joint action (Emerson et al. 2012). A shared discourse focuses on the need for conservation and reduction of ecological impacts of ALDFG, namely destruction or degradation of marine habitats and species. ALDFG is particularly insidious because it can persist over time, entangling fish, marine mammals, and birds, leading to their injury or death. Thus, there is a mutual understanding amongst actors that ALDFG impacts marine ecosystems, leading to internal validation amongst actors (i.e. legitimacy). However, there is a limited understanding of the challenge of ALDFG in terms of amount and continued release in the Baltic Sea, as well different views on how to define ALDFG. While fishers are required to report lost gear, their willingness to do so, and thus also the accuracy of data, is questioned. Moreover, interviewees highlight the challenge of accessing this data, held by states, describing it as a 'black box' (Research 1; NGO 1; Government 3 2024).

Thus while there is a sense of urgency amongst 'environmentally focused' actors (i.e. NGOs, environmental ministries) to participate in the CGR, this motivation is lacking from the fisheries sector due to concerns about future rules. In this regard, motivation by the fisheries sector to participate may also stem from a desire to maintain their 'social license' or standing within the CGR as opposed to actually addressing the issue. Financial considerations related to compliance with regulations aimed at preventing gear loss (e.g. lost space on vessels due to damaged gear) were highlighted by a few participants (Regional 1 and 2 2024; NGO 4 2024). This perspective was present among (some) actors and might be interpreted as a sign of distrust between actors or a weak commitment amongst some actors.

Capacity for joint action

The objective of collaboration is to facilitate joint action to address shared challenges and enhance individual actor capacities towards a common purpose (Emerson et al. 2012). Regional mechanisms provide opportunities to bring actors from different governance levels together. HELCOM and its Working and Expert Groups are key platforms for HELCOM member states to collaborate on the issue of ALDFG. Similarly, BSAC offers a forum for commercial fishers, fisher organisations, processors, anglers, and NGOs to collaborate and amplify recommendations throughout the region as well as to the EU (Regional 1 and 2 2024). Both organisations have an 'open door' policy, allowing for observers from civil society and research to participate (following established rules) in meetings (Regional 1 and 2 2024). In addition, both organisations collaborate at the Secretariat level (e.g. sharing recommendations for comments), through formal participation in working groups and yearly meetings, and 'informally' as many individuals participate in both organisations. However, while there is exchange, and a potential for joint action, between these two organisations (and sectors), they do not collaborate through shared activities (e.g. coordinated work programmes).

Within the CGR, different actors, i.e. producers, importers and sellers, fishers, ports and waste management as well as policy-makers (Member States and EU) and regional coordination (HELCOM, BSAC, BPO), have different competencies, capacities, and responsibilities. Moreover, economic concerns, which are heavily influenced by personal, organisational, or sectoral perspectives, influence discussions concerning joint action and the selection of management approaches. As a result, relatively few actors emphasised more than one management approach during interviews. However, it is not clear if this is the result of actors specialising based on their competencies or a lack of consensus about the best path forward. Approaches discussed include import and other market controls to limit poor quality (and cheap) gear from being deployed, clean-up of historically lost gear, addressing regulatory inefficiencies placed on various industry actors, improving data quality and availability, and full implementation of the EPR scheme.

'Return on investment' for ALDFG management actions was a common point of concern primarily for the various industry sectors relevant to ALDFG (Private 1; Regional 1 and 2 2024). Key to this discussion is (generally) two diverging views, namely whether ALDFG is primarily a historical problem requiring retrieval, or (also) an ongoing problem requiring coordinated efforts to mitigate continued loses of ALDFG. Along these

lines, there is a narrative shared amongst some actors regarding the level of importance of ALDFG in the region, because the fishing industry in the Baltic Sea region has declined (due to reduced fishing opportunities and poor stock conditions). These actors question whether it is essential to address ALDFG or if it overburdens an already struggling industry (Private 1; Regional 1 and 2 2024). If the level of concern about the issue does not exceed the associated costs with managing it for some actors, a sense of shared motivation amongst actors is hindered.

Power

Challenges in collaboration alone do not explain the gridlock within the CGR. In order to look deeper into the collaborative dynamics of the CGR, this section analyses the influence of power across Barnett and Duvall's (2005) typology of power (i.e. compulsory, institutional, structural, productive).

Compulsory power

Compulsory power refers to the direct control of one actor over another (Barnett and Duvall 2005). The EU (and Member States) have compulsory power over the fishers and ports to implement ALDFG policies. However, they do not have equal power over gear producers, importers and sellers, due to the diversity and complexity of the actors involved along the value chain, especially when considering that gear, or components to make gear, are primarily produced outside of the EU (Private 2 2024). Without the principled engagement of gear producers, importers, and sellers, however, Extended Producer Responsibility schemes remain difficult, or impossible, at the regional level. This leads to stalled progress or inaction toward this management option.

At the regional level, HELCOM facilitates actors to take joint action on EU policies. However, legal authority lies at the European (and Member State) level, established through existing policies (see Table 3). This contributes to a number of management options remaining on the table, potentially weakening capacity for joint action due to a lack of a singular vision or strategy.

Considering compulsory power, the fisheries sector, along with gear producers, importers and sellers, are able to influence discourses within the CGR rooted in their access to capital. Their power influences collaborative dynamics, potentially diminishing capacity for joint action. However, while fishers are engaging within the CGR, producers, importers and sellers are noticeably less engaged within the CGR. Countering this, NGOs and civil society are increasing awareness about ALDFG in the region and proposing opportunities to address ALDFG, highlighted for example through WWF's Mission GhostNetZero initiative (Research 1; NGO 1; NG0 3 2024). The targeted awareness raising by WWF is a means for them to draw attention to the need for action, and exert power over industry and policy actors to increase their engagement and address ALDFG. Shared motivation is further weakened by limited knowledge regarding the amount and location of ALDFG in the Baltic Sea region. NGO efforts to e.g. develop knowledge can also foster the capacity for joint action amongst actors.

Bringing together these power and collaboration dynamics, it is possible to identify power as both an enabler (+) and barrier (-) to collaboration (see Table 4).

Institutional power

Institutional power stems from the indirect control of socially distant others (Barnett and Duvall 2005). HELCOM's mandate is to coordinate a regional policy agenda towards joint action. This coordinating role, as opposed to authoritative, means that while HELCOM does not have legal authority e.g. to enforce EU policies, it aims to bring actors to the table by fostering a shared motivation to address common challenges and leverage joint action. As part of this, HELCOM Working Groups (i.e. representatives from national ministries) play a leading role in agenda setting, including selecting issues to pursue, prioritise, or eliminate (Government 1–5 2024).

HELCOM rules also establish which actors can participate in WG meetings. HELCOM is considered to be highly inclusive, thus enabling a wide range of actors within the CGR (in this case through Working Group meetings) to participate and collaborate on issues related to ALDFG (Regional 1 and 2; Government 1–5; NGO 2 2024). This spurs collaboration and underpins principled engagement and shared motivation across actor groups. Despite this inclusivity, some actors, namely the gear producers, importers, and sellers as well as the ports community, are less present in regional dialogue surrounding ALDFG (Research 1; Regional 1 and 2 2024). The noticeable lack of gear producers, importers, and sellers participating weakens the regional capacity for joint action.

A strong driving force behind this mandate and the shared motivation for collaboration is the EU's legal authority that requires States and the fishing sector to collaborate and engage. However, while gear retrieval is important when considering historical ALDFG in the Baltic Sea, there is currently no policy mandating clean-up activities (Research 1 2024), meaning that, actors, such as the EU and its Member States, lack the legal or persuasive capacity to initiate activities for retrieval.

Structural power

Structural power is established through actor relations (Barnett and Duvall 2005). In regard to structural power there is clear (legal) power held by the EU and national ministries (HELCOM contracting parties), which have a significant

Table 4 Power and collaboration in ALDFG governance in the Baltic Sea

Collaboration dynamics Types of power	Actor engagement	Shared motivation	Capacity for joint action
Compulsory power	(-) Actors, namely, gear producers, importers, and sellers, are not actively engaged in regional level discussions. (+) NGOs are exerting power through awareness raising and engagement strategies. (+) The EU compels actors to take action through its legal authority.	(-) Limited knowledge and data on the amount and location of ALDFG in the Baltic Sea limit actors' shared motivation.	(-) The lack of agreement on appropriate management measures to address ALDFG weakens capacity for joint action. (+) NGOs offer tools to overcome challenges related to knowledge, helping to spur capacity for joint action.
Institutional power	(-) HELCOM, the regional 'coordinator', lacks authority to require States to address ALDFG. (+) The EU acts as driver for Member States and the fishing sector to take action on ALDFG.	(+) HELCOM and its Working Groups ensure ALDFG remains on the regional policy agenda, where collaborative actions are formulated.	(-) The noticeable lack of gear producers, importers, and sellers participating in regional dialogue weakens the capacity for joint action. (-) The lack of an EU or regional policy or guidelines on retrieval of ALDFG impedes joint action.
Structural power	(-) The potential loss of revenue by industry (fisheries, gear, producers, importers and sellers) impedes actors from fully engaging. (+) EU, but also HELCOM, have a strong influence on the rules and norms which shape the participation of actors.		(-) Fisheries lack access to, or capacity (e.g. time, know how) to access, potentially available resources through available funding mechanisms.
Productive power		(-) Discourses on the potential financial burden of regulating ALDFG signals mistrust between actors. (+) Regional discourses highlighting the environmental impact of ALDFG act as a driver for shared motivation.	(-) Regional narratives regarding the 'decline' of the fishing industry potentially hinder joint action, as actors do not want to hinder an already struggling sector. (-) Gear producers, sellers, and importers are largely absent from discourses weakening capacity for joint action.

influence on the development of institutional arrangements (i.e. rules of the game) through their role in establishing and enforcing policies. Moreover, those actor groups with more access to resources (i.e. capital) and capacity within the CGR, namely national ministries and corporations (i.e. gear producers, importers, and sellers) hold comparatively more structural power. Conversely, the fisheries sector lacks capacity, e.g. in terms of time, know how, to access resources, such as funding mechanisms and innovation initiatives (Research 1; Private 1 2024). This reduces their capacity to engage in collaborative actions and joint action. After all, the economic dimensions, recognised through prevalent discourses, indicate that the perceived potential loss of revenue by industry (fisheries, gear, producers, importers and sellers) impedes actors from fully engaging within the CGR.

Productive power

Productive power is produced through diffuse social relationships (Barnett and Duvall 2005). Productive power can be difficult to disentangle as it is rooted in discourses, social processes, and knowledge systems within a CGR. Nevertheless, when looking at ALDFG in the Baltic Sea region, it becomes clear that the fishers hold power through discourses, as multiple actors recognise the sector's collaborative role and the need to work with fishers to address the challenge. Key to this narrative is a common understanding of the environmental impacts of ALDFG amongst actors, thereby facilitating a shared motivation to address the issue. Discourses on the potential financial burden of regulating ALDFG also signals potential mistrust between actors

influencing shared motivation. Other narratives recognised in the region are the 'decline' of the fishing industry hindering capacity for joint action, as actors do not want to burden an already struggling sector. As the gear producers, sellers, and importers remain largely absent from discourses on ALDFG in the Baltic Sea region, they access productive power by remaining absent from the debate and somewhat 'off the radar', weakening capacity for joint action.

Discussion

While much attention is given to regional ocean governance, most research focuses on how institutions are organised (e.g. Mahon and Fanning 2019; Mahon and Fanning 2021), with little focus on how multi-level governance shapes power and collaboration. This study asked 'how do power relations affect the collaborative dynamics within ALDFG governance in the Baltic Sea region?'. By analysing how collaboration dynamics and power intersect, several themes impacting the performance of Baltic Sea ALDFG governance emerge. The analysis shows that the lacking capacity for joint action can be explained by the institutional setting and structural conditions of multi-level governance (van Noort et al. 2025). It also shows how discourses shape collaboration through hindering and enabling principled engagement and shared motivation.

Power (compulsory, institutional) traditionally lies with state institutions which largely determine the contents and organisation of governance arrangements, by establishing the rules of the game dominant discourses and allocating power resources to other actors (Arts and van Tatenhove 2004). The analysis shows that the legal system context of the CGR, mainly at the EU level and coordinated at the regional level, impacts principled engagement from actors, impeding shared motivation and capacity for joint action in both negative and positive ways. On the one hand, ALDFG governance in the Baltic Sea region is shaped by regulatory frameworks and institutions from local, national, regional (Baltic Sea), and supranational (EU) levels. The EU and HELCOM overlap in membership and many of their priorities for action regarding ALDFG align, reinforcing one another across governance levels. In addition, the number of actors and networks within the Baltic Sea region suggests that the number of possible interactions (i.e. collaborations), is enormous (Boström et al. 2016).

On the other hand, reviewing the policies (see Table 3) for establishing the rules for governing ALDFG in the Baltic Sea, however, shows a lack of clear system context regulations on reducing and retrieving ALDFG pollution. Moreover, while a CGR around ALDFG governance exists for the Baltic Sea, the CGR is unable to fill these system context gaps through for example establishing a policy on retrieval of fishing gear. Such a policy (e.g. guidelines or best practices) was highlighted by interview participants as an appropriate mechanism to address ALDFG due to historical fishing activities.

Discourses turned out to be an important means of productive power within the CGR, both hindering and enabling shared motivation and capacity for joint action amongst actors. Actors highlight the environmental and social impacts of ALDFG in the Baltic Sea and the need to take regional action. NGOs have a particular important role in pointing to the environmental effects of ALDFG in the Baltic Sea and independently develop tools to locate lost gear. This, in turn, facilitates shared motivation amongst actors. However, capacity for joint action is weakened by a powerful regional (socioeconomic) narrative surrounding the economic vulnerable fisheries sector. This discourse lacks attention for viable alternatives for managing the sector and addressing ALDFG in a cost-effective manner. This demonstrates the importance of diffuse and indirect sources of power on collaboration dynamics, which influence capacity for joint action within CGRs. Moreover, the overlap of productive and structural power, produced across social processes, shapes how actors perceive their interests. This also shows how discourses are not merely discussions amongst actors, but sites of social relations of power, because they integrate 'understandings about life' and shape how actors imagine and pursue strategies (Barnett and Duvall 2005).

In addition, the lack of formalised legal power (compulsory, institutional) of HELCOM impacts capacity for joint action at the regional level. Instead, HELCOM builds on the EU's supranational legal authority, which it leverages, along with its own institutional mandate, to coordinate actors to take joint action. While HELCOM's role is primarily centered on coordination, it must persuade actors to take joint action, while being hindered by e.g. differing time scales and approaches across policies, the plurality of values, diversity of mandates, and limited knowledge spread across actors, at different governance levels and within different sectors. HELCOM seeks to overcome this challenge through its Working Groups, which generate shared motivation through exchange and agenda setting. However, it should be noted that HELCOM Working Groups are made up largely by environmental ministries of its Contracting Parties and that other national ministries (e.g. fisheries) are often not, or less, involved in regional debates coordinated by HELCOM. Thus, while collaboration within these specific areas is coordinated by key actors (e.g. through BSAC and HELCOM) there is little comprehensive coordination in terms of e.g. joint action across them. Thus there is a lack of institutional power to set the norms, rules and content between actors which span this divide.

On top of that, the noticeable absence of key actors such as gear producers is also a gap in governance. While identified as relevant to the policy framework (see Table 3), in particular for the implementation of EPR schemes, their participation in regional dialogues to address ALDFG remains limited. Considering Barnett and Duvall (2005), they exert power by remaining absent from social relations, i.e. not directly participating in the CGR. This lack of principled engagement further weakens the institutional power within the region and hinders capacity for joint action amongst regional actors to develop meaningful initiatives through EPR schemes (e.g. deposit schemes) and/or contribute to costs of retrieval.

Taking a case study lens and identifying collaborative governance challenges also helps point towards opportunities to improve governance to better address ALDFG within the Baltic Sea region. While several EU level policies provide the legal backdrop to spur joint action within the CGR, implementation is lagging and actors remain in limbo about which management options to pursue. Based on the analysis, a number of opportunities to improve collaborative governance of ALDFG emerged, including:

- Developing a mechanism or working agreement across sectors (e.g. fisheries, waste, ports, and environment) to establish a joint work programme, create shared initiatives, and collaborate on activities including knowledge and information exchange. Such a mechanism could select a general coordinator to facilitate action and build on established ties, such as between HELCOM and BSAC.
- Establishing stronger links with producers, importers, and sellers and bring this diverse group of actors into regional discussions on ALDFG. Their increased participation would strengthen regional action and boost capacity for joint action and enable new types of initiatives (e.g. marking).
- Improving data and knowledge gaps by establishing a regional platform for locations and amounts of ALDFG, building on existing initiatives such as WWF's Ghost Gear Initiative. Collaboration between sectors, as well as across governance levels, could also underpin new approaches for monitoring and data collection.
- Boosting fishers capacity to participate in regional initiatives on ALDFG, by supporting their access to EU and regional funding mechanisms or creating new mechanisms to fund actions that address ALDFG.
- Creating a (voluntary) regional strategy based on guidelines, pilots and best practices for retrieval of ALDFG. Such a strategy could act as a first step towards more formal policy initiatives, at the regional or EU level.

Conclusion

Our study demonstrates that collaboration dynamics act as crucial barriers to coordinated action to address ALDFG in the Baltic Sea region. At the root of these barriers are power dynamics, which are often hidden, but play out across the CGR. By synthesising theories of collaborative governance and power and applying these to the case of ALDFG in the Baltic Sea region, we show that it is not only possible, but highly insightful to explain governance dynamics that impede the performance of plastic pollution governance such as for ALDFG. While it is difficult to separate power and collaboration dynamics, it is necessary to identify root causes of governance challenges, break existing gridlock within governance processes, and develop new management approaches to address plastic pollution and other global sustainability challenges. There is great interest amongst researchers to understand the role of collaboration dynamics on governance processes, and increasing efforts to integrate understanding of power into collaborative governance theories. However, few studies take the next step and explore the intersection of collaboration and power through a case study to identify the impact of these two dimensions on governance processes and outcomes. Understanding power and its intersection with collaboration might also enable deeper learning by actors, allowing new opportunities for change to emerge. Thus, further studies to explore the role of reflexivity within governance, focusing on the role of power, are needed.

Acknowledgements The authors thank Shannon Mclaughlin (Wageningen University and Research) and participants at the MARE Conference 2025 for comments and discussion on a draft version of this paper. We acknowledge Frederike Neumann, RIFS Student Assistant (2024), for assistance with literature collection. We are grateful to all interview participants for their contributions. This work was supported by European Union's Horizon Europe research and innovation programme HORIZON-CL6-2022-GOVERNANCE-01-03 under grant agreement No 101086297.

Declarations

Conflict of interest The authors declare that there are no financial or non-financial conflicts of interest related to the content of this manuscript. Any views presented are the authors' alone and do not necessarily reflect those of the Helsinki Commission or the Contracting Parties to the Helsinki Convention.

References

Ansell, C., and A. Gash. 2008. Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory* 18(4):543–571. https://doi.org/10.1093/jopart/mum032

Arts, B., and J. V. Tatenhove. 2004. Policy and power: A conceptual framework between the 'old' and 'new' policy idioms. *Policy Sciences* 37(3–4):339–356. https://doi.org/10.1007/s11077-005-0156-9

Avoyan, E., J.V. Tatenhove, and H. Toonen. 2017. The performance of the Black Sea Commission as a collaborative governance regime. *Marine Policy* 81: 285–292. https://doi.org/10.1016/j.marpol.2017.04.006.

Barnett, M., and R. Duvall. 2005. Power in international politics. *International Organization* 59(01). https://doi.org/10.1017/S0020818305050010

Batory, A., and S. Svensson. 2019. The fuzzy concept of collaborative governance: A systematic review of the state of the art. *Central European Journal of Public Policy* 13 (2): 28–39. https://doi.org/10.2478/cejpp-2019-0008.

Boström, M., S. Grönholm, and B. Hassler. 2016. The Ecosystem Approach to Management in Baltic Sea Governance: Towards Increased Reflexivity? In *Environmental Governance of the Baltic Sea*, ed. M. Gilek, M. Karlsson, S. Linke, and K. Smolarz, 149–172. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-27006-7_7.

Directive. 2008. /98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Text with EEA relevance).

Directive 2008/56/EC of the European Parliament and of the Council. of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) (Text with EEA relevance).

Directive 2019/904 of the European Parliament and of the Council of. 5 June 2019 on the reduction of the impact of certain plastic products on the environment (Text with EEA relevance).

Directive 2019/883 of the European Parliament and of the Council of 17. April 2019 on Port reception facilities for the delivery of waste from ships, amending directive 2010/65/EU and repealing directive 2000/59/EC (Text with EEA relevance).

Emerson, K., and T. Nabatchi. 2015. *Collaborative governance regimes*. Public management and change series Washington, D.C: Georgetown University Press.

Emerson, K., T. Nabatchi, and S. Balogh. 2012. An integrative framework for collaborative governance. *Journal of Public Administration Research and Theory* 22(1):1–29. https://doi.org/10.1093/jopart/mur011

Environmental, Investigation Agency. 2023 Untangled. : The Plastics Treaty's Critical Role in Tackling Fishing Gear. https://eia-international.org/wp-content/uploads/2023-Fishing-gear-policy-briefing.pdf

European Parliament. 2024. EU Fisheries Management | Fact Sheets on the European Union. https://www.europarl.europa.eu/factsheets/en/sheet/115/eu-fisheries-management

European Commission. 2023. EU Action Plan: Protecting and Restoring Marine Ecosystems for Sustainable and Resilient Fisheries. COM(2023) 102 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023DC0102

European Commission. 2020. A New Circular Economy Action Plan: For a Cleaner and More Competitive Europe. COM(2020) 98 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0098

European Commission. 2021. EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'. COM(2021) 400 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0400&qid=1623311742827

Food and Agriculture Organization of the United Nations (FAO). 1995. *Code of Conduct for Responsible Fisheries*. p.41.

Gänzle, S. 2018. Experimental union' and Baltic Sea cooperation: The case of The European union's strategy for The Baltic Sea region (EUSBSR). *Regional Studies Regional Science* 5 (1): 339–352. https://doi.org/10.1080/21681376.2018.1532315.

Gerlak, A.K., T. Heikkila, and M. Lubell. 2013. The Promise and Performance of Collaborative Governance. In *The Oxford Handbook of U.S. Environmental Policy*, 1st edition, ed. M.E. Kraft and S. Kamieniecki, 413–434. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199744671.013.0019.

Giskes, I., J. Baziuk, H. Pragnell-Raash, and A. Perez Roda. 2022. Report on good practices to prevent and reduce marine plastic litter from fishing activities. *FAO and IMO*. https://doi.org/10.4060/cb8665en

Grönholm, S. 2018. A tangled web: Baltic Sea region governance through networks. *Marine Policy* 98: 201–210. https://doi.org/10.1016/j.marpol.2018.09.013.

Haugaard, M. 2003. Reflections on seven ways of creating power. *European Journal of Social Theory* 6(1):87–113. https://doi.org/10.1177/1368431003006001562

Harley, J. 2004. Case study research. In *Essential guide to qualitative methods in organizational research*, ed. C. Cassell, and G. Symon. 323–333. Sage.

HELCOM. n. d. The Helsinki Convention. https://helcom.fi/about-us/convention/

HELCOM. 2021a. Revised Regional Action Plan on Marine Litter. https://helcom.fi/wp-content/uploads/2021/10/HELCOM-Recommendation-42-43-3.pdf

HELCOM. 2021b. Baltic Sea Action Plan – Update. https://helcom.fi/wp-content/uploads/2021/10/Baltic-Sea-Action-Plan-2021-update.pdf

Kammann, U., P. Nogueira, E. Wilhelm, I. Int-Veen, M.-O. Aust, and K. Wysujack. 2023. Abandoned, lost or otherwise discarded fishing gear (ALDFG) as part of marine litter at the seafloor of the Baltic Sea – Characterization, quantification, polymer composition and possible impact. *Marine Pollution Bulletin*. https://doi.org/10.1016/j.marpolbul.2023.115348.

Kranjnc, D., D. Kovačič, E. Žunec, K. Brglez, and R. Kovačič Lukman. 2022. Youth awareness and attitudes towards a circular economy to achieve the Green Deal goals. *Sustainability* 14 (19): 12050.

Landrigan, P.J., S. Dunlop, M. Treskova, H. Raps, C. Symeonides, et al. 2025. The Lancet countdown on health and plastics. *Lancet* 406 (10507): 1044–1062. https://doi.org/10.1016/S0140-6736(25)01447-3.

Lebreton, L., B. Slat, F. Ferrari, B. Sainte-Rose, J. Aitken, R. Marthouse, S. Hajbane, S. Cunsolo, A. Schwarz, A. Levivier, K. Noble, P. Debeljak, H. Maral, R. Schoeneich-Argent, R. Brambini, and J. Reisser. 2018. Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic. *Scientific Reports* 8 (1): 4666. https://doi.org/10.1038/s41598-018-22939-w.

Lukes, S. 2006. *Power: a radical view*. 2. ed. Houndmills: Palgrave Macmillan.

Mahon, R., and L. Fanning. 2019. Regional ocean governance: Integrating and coordinating mechanisms for polycentric systems. *Marine Policy* 107: 103589. https://doi.org/10.1016/j.marpol.2019.103589.

Mahon, R., and L. Fanning. 2021. Scoping science-policy arenas for regional ocean governance in the Wider Caribbean Region. *Frontiers in Marine Science* 8: 685122. https://doi.org/10.3389/fmars.2021.685122.

Mayfadyen, G., T. Huntington, and R. Cappell. 2009. Abandoned, Lost or Otherwise Discarded Fishing Gear. *UNEP Regional Seas Reports and Studies* No.185; FAO Fisheries and Aquaculture Technical Paper, No. 523. Rome, UNEP/FAO. 2009. 115p.

McIlwain, L., J. Holzer, J. Baird, and C. Baldwin. 2023. Power research in adaptive water governance and beyond: A review. *Ecology and Society* 28 (2): art22. https://doi.org/10.5751/ES-14072-280222.

Morrison, T.H., W.N. Adger, K. Brown, M.C. Lemos, D. Huitema, J. Phelps, L. Evans, P. Cohen, A.M. Song, R. Turner, T. Quinn, and T.P. Hughes. 2019. The black box of power in polycentric environmental governance. *Global Environmental Change* 57: 101934. https://doi.org/10.1016/j.gloenvcha.2019.101934.

Nohrstedt, D. 2016. Collaborative governance regimes. *Public Administration* 94(4):1157–1159. https://doi.org/10.1111/padm.12278

Phillips, C. 2017. Ghostly encounters: Dealing with ghost gear in the Gulf of Carpentaria. *Geoforum* 78: 33–42. https://doi.org/10.1016/j.geoforum.2016.11.010.

Purdy, J.M. 2012. A framework for assessing power in collaborative governance processes. *Public Administration Review* 72 (3): 409–417. https://doi.org/10.1111/j.1540-6210.2011.02525.x.

Ramos, S., F. Espincho, S.M. Rodrigues, R. Pereira, D. Silva, L. Rivoira, R. Perdigão, and C.M.R. Almeida. 2025. An integrated approach to assessing the potential of plastic fishing gear to release microplastics. *Water* 17 (10): 1439. https://doi.org/10.3390/w17101439.

Regulation, (EU). 2023. /2842 of the European Parliament and of the Council of 22 November 2023 amending Council Regulation (EC) No 1224/2009, and amending Council Regulations (EC) No 1967/2006 and (EC) No 1005/2008 and Regulations (EU) 2016/1139, (EU) 2017/2403 and (EU) 2019/473 of the European Parliament and of the Council as regards fisheries control (2023).

Regulation, and EU) 2019/1241 of the European Parliament and of the Council of 20. 2019. (June 2019 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures, amending Council Regulations (EC) No 1967/2006, (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022 of the European Parliament and of the Council, and repealing Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005, 198 OJ L &#167.

Richardson, K., B.D. Hardesty, J.Z. Vince, and C. Wilcox. 2021. Global causes, drivers, and prevention measures for lost fishing gear. *Frontiers in Marine Science*. https://doi.org/10.3389/fmars.2021.690447.

Richardson, K., B.D. Hardesty, J. Vince, and C. Wilcox. 2022. Global estimates of fishing gear lost to the ocean each year. *Science Advances* 8 (41): eabq0135. https://doi.org/10.1126/sciadv.abq0135.

Rijkure, A., K. Cerbule, and J. Megnis. 2024. Abandoned, lost, or otherwise discarded fishing gear in coastal fisheries: A case study in the Baltic Sea coastal waters of Latvia. *Marine Policy* 165: 106187. https://doi.org/10.1016/j.marpol.2024.106187.

Stolte, A., G. Dederer, J. Lamp, C. Fenn, M. Lee, W. Frank, C. Howe, M. Günther, H. Vesper, and S. Werner. 2022. The quest for ghost gear in the German Baltic Sea: A team effort between WWF, divers, fisherfolk, and public authorities. *Frontiers in Marine Science* 9: 981840. https://doi.org/10.3389/fmars.2022.981840.

Tschernij, V. 2019. *WP3 Report Strategies for preventing gear loss in the Baltic Sea.* https://static1.squarespace.com/static/58525fe86a4963931b99a5d1/t/5dd3d6be73af0e4699feb79f/1574164204022/2+Strategies+for+preventing+gear+loss.pdf

Unsbo, H., M. Bolternstern, and M. Olshammar. 2023. *Quantification and environmental pollution aaspects of lost fishing gear in the Baltic Countries*. 79. Nordisk Ministerrå. https://doi.org/10.6027/temanord2022-568

van Noort, C., J. Van Leeuwen, H. Toonen, J. Van Tatenhove, P. Haapasaari, W. Flannery, K.N. Nielsen, B. Boteler, C. Passarello, S.C.S. Dyremose, K. Rathcke, and R. Varjopuro. 2025. A multi-layered collaborative marine governance model: Evaluating change and innovation of marine governance arrangements. *Environmental Policy and Governance*: eet.70002. https://doi.org/10.1002/eet.70002.