RESPONSE

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REGIONAL ACTION PLAN

FOR CAPACITY BUILDING ON MARINE POLLUTION EMERGENCY PREPAREDNESS & RESPONSE IN THE BLACK SEA BASIN

ABOUT THIS REGIONAL ACTION PLAN

The present Regional Action Plan for Capacity Building in Marine Pollution Emergency Preparedness and Response in the Black Sea is the principal strategic output of a process combining a comprehensive assessment of marine pollution threats in the Black Sea Basin, a systematic analysis of preparedness and response training needs across the riparian states, and close collaboration with national and regional stakeholders, whose inputs shaped both the diagnosis and the proposed responses. It translates these findings into a proposed set of interventions aimed at establishing a common framework across all Black Sea coastal countries for the sustained delivery of training in marine pollution preparedness and response, integrating the full range of pollution sources, including emerging, conflict-related, and climate-amplified threats, into a training and management scene fit for current and future conditions. Two strategic goals give direction to all proposed actions: to encourage regional cooperation and advanced training in the monitoring and management of both familiar and emerging pollution sources, with particular attention to conflict-related hazards; and to facilitate training, knowledge exchange, and cooperation among coastal countries with the same specific focus.

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For more information on the RESPONSE project and its activities, you may visit ***www.response-project.com***

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CONTENTS

ABOUT RESPONSE PROJECT

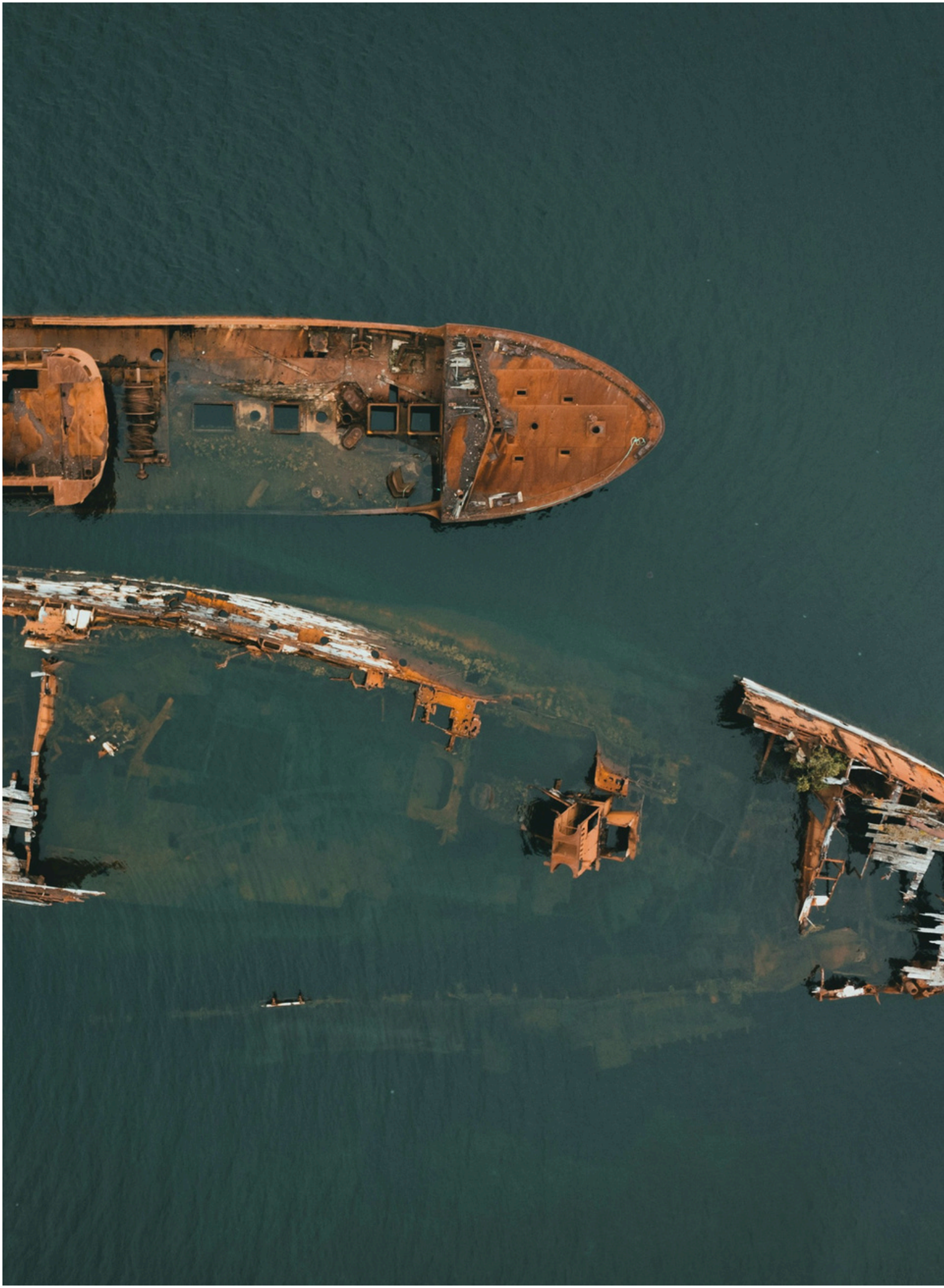
Background and context

The RESPONSE project - Building Response Frameworks under existing and new Marine Pollution Challenges in the Black Sea-, supported by the European Union EMFAF, under Grant Agreement no 101124661 has duration of 36 months, starting from 01.10.2023. The project consortium involves six partners from five different countries: Greece, Bulgaria, Romania, Ukraine and Georgia. Five of the participants are based in countries bordering on the Black Sea, and the lead beneficiary, the Aristotle University of Thessaloniki (AUTH), has a long history of working with the region and with members of the consortium. The partnership includes one university, two research institutes and three environmental NGOs: the Black Sea NGO Network (BSNN) regional NGO network based in Varna, Bulgaria; the National Institute of Marine Research and Development (NIMRD), based in Constanta, Romania, leading research institute for the Black Sea; the State Organization «Institute of Market and Economic & Ecological Research of the NAS of Ukraine» (SO IMEER NASU), Odesa, a public institution, part of the National Academy of Sciences of Ukraine; the Black Sea Branch of Ukrainian Environmental Academy of Sciences (BSBUEAS) is Odesa-based NGO with a team of professional researchers; and the Greens Movement of Georgia / Friends of the Earth (GMG/FoE) – Georgia, an NGO, part of the international environmental network. All three beneficiaries from EU Member States have extensive experience in marine pollution projects under the Horizon 2020 and Horizon Europe programmes.

RESPONSE aims to identify and promote the development and establishment of new-generation advanced training schemes and curricula to support early warning, region-wide mechanisms for monitoring natural and man-made disasters. Various training programs, platforms and curriculum have been implemented to monitor marine pollution and ensure knowledge integration and dissemination. Still, training material, best practices, standards and protocols often differ among platforms and programs, hindering progress towards implementing an integrated, transdisciplinary and multidisciplinary marine pollution training system. Peculiar events, such as armed conflicts, create new environmental and societal challenges that call for international, coordinated responses.

RESPONSE acknowledges the importance of deeper understanding of marine ecosystems and river-delta-sea connections, the need for development of harmonized procedures, standards and methodologies in marine monitoring across the Black Sea countries to support healthy and resilient seas and foster integrated marine governance. The sustainable changes that are required for the establishment of efficient, advanced training schemes that would be integrated with the challenges, goals and specificities of the scientific and social context and make the most of the untapped capacity of stakeholders to promote regional awareness in the field.

In view of the background and context described above, the four overarching objectives of RESPONSE are: 1) IDENTIFY and UNDERSTAND the institutional and societal gaps and needs for effective, integrated, transdisciplinary and multidisciplinary marine pollution training systems; 2) DEVELOP effective training programs by assembling, integrating, and improving the most promising approaches and results into a comprehensive framework that consists of a set of methodological training tools, databases, policy recommendations, and background information; 3) SUPPORT the implementation of the EU and Regional Strategies, by developing operational guidelines for effective application, updating, monitoring and management of training programs on marine pollution; 4) EMPOWER marine pollution training, monitoring and mitigation by involving, inspiring and influencing stakeholders through a broader vision of co-design, co-creation, co-establishment, co-implementation and co-assessment of the training programs.



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INTRODUCTION

The Black Sea (BS) is one of Europe's most ecologically and economically significant marine regions, and also one of its most environmentally pressured. The pollution threats it faces are multiple, interconnected, and growing, shaped by decades of industrial, agricultural, and maritime activity across a vast multi-country catchment, compounded in recent years by the acute environmental consequences of armed conflict, and amplified by the accelerating effects of climate change. The gap between the scale of this challenge and the regional capacity to respond to it has long been apparent. What has been less consistently addressed is the training and institutional infrastructure needed to close it.

This Regional Action Plan (RAP) aims to become a response to that gap. It has been developed through a structured, evidence-based process involving the systematic assessment of the current pollution landscape, the identification of the principal needs and gaps in preparedness and response training across the riparian states, the extensive communication and close collaboration with BS stakeholders, and the translation of those findings into concrete, actionable priorities. Throughout this process, the direct inputs of national experts, institutional representatives, and stakeholders from across the basin have been integral to ensuring that the RAP is grounded in operational reality rather than formal frameworks alone.

The RAP is addressed to the full range of actors engaged in or responsible for marine pollution preparedness and response across the Black Sea Basin (BSB), national authorities, scientific and research institutions, coast guard and civil protection services, port administrations, NGOs, and the international bodies whose expertise and resources the region needs to draw on. It is offered not as a prescriptive blueprint but as a common framework: a shared foundation from which riparian states and regional bodies can work, according to their capacities and priorities, toward a more coordinated, more resilient, and better prepared BS region.

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CHAPTER I

MARINE POLLUTION THREATS IN THE BLACK SEA BASIN

Overview

The BSB is one of Europe's most ecologically and economically significant marine regions, supporting the livelihoods of more than six million people in its coastal zone across six littoral states, Bulgaria, Georgia, Romania, Russia, Türkiye, and Ukraine, and the populations of inland nations whose rivers drain into the basin. The BS has experienced a distressing increase in pollution over the past two decades, emerging as Europe's most polluted sea. The priority transboundary pollution problems identified by regional policy frameworks since the mid-1990s, eutrophication, chemical pollution, changes in marine living resources, and biodiversity loss, have not only persisted but have been compounded by the emergence of plastic pollution, the intensification of maritime traffic, and the acute environmental consequences of the ongoing armed conflict in Ukraine.

The semi-enclosed character of the BS, its pronounced vertical stratification between oxygenated surface waters and anoxic depths, and its vast catchment area spanning, entirely or partially, 22 countries make it exceptionally vulnerable to cumulative pollution. The BS is affected by numerous anthropogenic pressures, such as eutrophication and pollution through coastal and river discharges, fisheries overexploitation, marine traffic, species invasions, and the impacts of climate change. Pollutants introduced anywhere within the 2.3-million-km² watershed eventually reach the sea, underlining the fundamentally transboundary character of the challenge and the consequent need for harmonised, region-wide preparedness and response frameworks.

The pollution threats facing the BSB are multiple, interconnected, and in several cases mutually reinforcing. No single threat can be effectively addressed in isolation. This chapter provides a concise assessment of each principal threat, its current status, and the preparedness and response gaps it generates, forming the evidence base for the priority actions proposed in subsequent chapters of this RAP.

Chemical contaminants

Heavy metals

Heavy metal contamination continues to be detected at concerning levels across water, sediment, and biota throughout the BSB. Heavy metals, including lead, cadmium, and mercury are significant pollutants largely attributed to industrial activities and legacy pollution. These substances enter the marine environment through industrial wastewater discharges, mining operations, agricultural runoff, and urban waste systems, and are further transported via rivers and atmospheric deposition from contaminated inland areas.

Their consequences are long-term and severe. Heavy metals bioaccumulate in marine organisms and biomagnify up the food chain, reaching concentrations in commercially important fish species far above ambient water levels. Contaminated seafood is the primary route of human exposure, with established links to neurological disorders, renal damage, and carcinogenicity. At the ecosystem level, heavy metals degrade benthic habitats, impair the microbial communities essential for nutrient cycling, reduce reproductive success in marine organisms, and erode the genetic diversity of affected populations. Effective preparedness requires harmonised sampling methodologies across the basin and the capacity for rapid exposure assessment following acute contamination events.

Persistent organic pollutants and emerging contaminants

Organochlorine pesticides, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs) remain a category of particular strategic concern because of their persistence in marine sediments, their capacity for long-range atmospheric transport, and their continued detection in BS biota decades after many were banned or regulated. PAHs are prevalent in both nearshore and offshore regions, while organochlorine pesticides and PCBs have been detected across various matrices, with significant

concentrations observed in water and biota samples. PAHs are closely linked to petroleum combustion and shipping activity, and their concentrations are further elevated by the destruction of oil-related infrastructure during armed conflict.

Beyond these established contaminants, pharmaceutical residues, flame retardants, and endocrine-disrupting compounds are now being detected in BS coastal waters with increasing frequency. These emerging pollutants are not yet systematically addressed by regional monitoring programs, representing a growing gap between the evolving contamination reality and the regulatory and response frameworks in place to manage it.

Marine litter and plastic pollution

Marine litter, encompassing macroplastics and microplastics, has become one of the most rapidly growing marine pollution threats in the BSB. Plastic pollution, including microplastics, poses a significant threat to the BS's delicate ecosystem, accumulating due to unsustainable consumption and production patterns, inadequate waste management, and insufficient public awareness. Land-based sources account for the large majority of inputs, with rivers, above all the Danube, acting as primary conduits for plastic debris transported from across the European continent. Marine-based sources including the fishing industry, commercial shipping, and coastal tourism contribute additional and significant loads.

Macroplastics cause direct physical harm to marine fauna through ingestion and entanglement and accumulate on beaches with serious economic consequences for coastal communities dependent on tourism and fisheries. Microplastics, particles below 5 mm in size, are now detected throughout tissues of organisms ranging from plankton to commercially harvested fish species. Their ability to adsorb and concentrate persistent organic pollutants means they function as vectors for the co-transport of chemical contaminants already of concern in the region.

Despite the scale and urgency of this threat, harmonised basin-wide protocols for the monitoring and assessment of marine litter and microplastics do not yet exist across the BS countries. Addressing this gap — through the establishment of common protocols and the building of consistent technical capacity across the basin — is one of the priorities reflected in the actions proposed under this RAP.

Oil and petroleum hydrocabon pollution

Oil pollution represents both a chronic, diffuse threat arising from routine maritime operations and an acute, episodic threat associated with vessel accidents, pipeline failures, and the destruction of oil infrastructure. The BS is a major transit corridor for oil and gas exports, and the volume of oil transported through its waters has increased substantially over recent decades.

Oil spills create surface slicks that block sunlight and oxygen transfer, smother marine organisms, contaminate food chains at all trophic levels, and cause lasting damage to critical coastal habitats, including seagrass beds, intertidal zones, and wetlands. The socioeconomic consequences extend to fisheries, aquaculture, and tourism, sectors of major importance to coastal communities across all littoral states. While response to acute oil spill events is among the more developed areas of existing contingency planning, preparedness for chronic diffuse petroleum contamination and for the scale of oil pollution arising from conflict-


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related destruction of maritime and coastal infrastructure remains significantly underdeveloped.

Conflict-related pollution

The ongoing war in Ukraine has introduced a qualitatively new and severe dimension to the marine pollution threat landscape of the BSB. The war has accelerated the degradation of the marine environment and is posing new risks that will persist for decades. The environmental consequences of the conflict span multiple pollution types simultaneously, creating compound hazard scenarios of a complexity that existing regional response frameworks were not designed to address.

Oil spills from damaged and sunken vessels have contaminated extensive coastal and offshore areas. Scientists estimate that oil slicks have covered thousands of square kilometres of Ukraine's marine protected areas, impeding oxygen penetration and inflicting severe damage on marine life. The June 2023 destruction of the Kakhovka Dam on the Dnieper River, releasing vast volumes of fresh water contaminated with fertilisers, fuel, lubricants, and sewage, affecting over 7,300 km² of sea area, represents the single most severe acute pollution event in the BS in recent decades. The destruction of coastal industrial infrastructure, including wastewater treatment plants, chemical storage facilities, and port installations, has introduced uncontrolled discharges of heavy metals, hazardous chemicals, fuels, and nutrient-rich wastewater into river systems and the sea.

Sea mines and unexploded ordnance add a further dimension of persistent environmental and navigational risk. Some mines have surfaced in Bulgaria and Romania because of the BS's counterclockwise currents, causing hazards for maritime traffic. Beyond their immediate physical danger, mines contaminate surrounding sediments and waters with explosive residues and heavy metals, and their presence severely restricts scientific access to affected areas, generating critical gaps in the environmental monitoring that is needed precisely when baseline data are most urgently required.

Regional preparedness frameworks must therefore incorporate response scenarios for multi-stressor acute pollution events, for operation under conditions of restricted monitoring access and reduced institutional capacity, and for coordination between civil and military environmental response authorities across national boundaries.

Nutrient pollution and eutrophication

Nutrient enrichment remains one of the most pressing marine pollution challenges in the BSB. Agricultural runoff from the catchments of the Danube, Dnieper, Dniester, and Don rivers, combined with inadequate or absent urban wastewater treatment across much of the basin, delivers large and sustained quantities of nitrogen and phosphorus compounds to the sea. Atmospheric deposition of nitrogen oxides from industrial and transport sources constitutes a further, often underappreciated pathway that remains insufficiently quantified under current regional monitoring arrangements. The Danube alone carries an estimated 80% of the river-borne inorganic nitrogen reaching the sea, yet monitoring of nutrient loads from smaller rivers across the basin remains inadequate and inconsistent between countries.

Despite partial improvements observed during the economic disruptions of the 1990s, eutrophication pressures have intensified with the resumption and expansion of agricultural activity. Eutrophication caused by nutrient pollution continues to be identified by international bodies, including the World Bank and the Global Environment Facility, as one of the most critical threats to the BS ecosystem. Excessive algal blooms deplete dissolved oxygen as they decompose, generating hypoxic and anoxic dead zones that devastate benthic communities, disrupt fish recruitment, and favour the proliferation of gelatinous species. These consequences compound the pressures on commercial marine living resources and amplify the effects of other pollution stressors.

Eutrophication is particularly demanding from a preparedness and response perspective because its drivers are diffuse and cross-jurisdictional, difficult to attribute to specific national sources, and shaped by climate-driven changes in temperature and hydrology that are expected to intensify over the coming decades. Effective response requires harmonised, basin-wide monitoring protocols and early-warning systems that do not yet exist in a fully operational form across the region.

Ballast water and invasive species

Ballast water discharge by commercial vessels continues to introduce non-indigenous species into the BS ecosystem. The ctenophore *Mnemiopsis leidyi*, introduced via ballast water in the 1980s, produced catastrophic disruption of the marine food web and contributed directly to the collapse of anchovy and other commercially important fish populations — an event from which BS fisheries have not fully recovered. Ongoing maritime traffic through the Turkish Straits maintains continuous biological introduction pressure, with dozens of new alien species recorded in the basin over recent decades. Each introduction carries the potential to interact with existing chemical and nutrient pollution stressors in ways that are difficult to predict and potentially irreversible, making early detection and rapid response essential components of a comprehensive preparedness framework.

Radioactive contamination

The BSB carries a radioactive contamination legacy rooted primarily in the 1986 Chernobyl nuclear disaster, which deposited long-lived caesium-137 and strontium-90 across the region. These isotopes continue to accumulate in sediments and persist through the marine food web. Their significance has been dramatically elevated by the ongoing armed conflict in Ukraine, which has placed the Zaporizhzhia nuclear power plant, Europe's largest, under conditions of military occupation and repeated security threat, creating a persistent risk of large-scale radioactive release into the marine environment for which no adequate regional response framework currently exists.

Radioactive substances cause direct cellular toxicity in marine organisms, disrupt food chains through bioaccumulation, and can reduce biodiversity over decadal to centennial timescales. The long half-lives of the principal isotopes of concern mean that the consequences of any significant new release would persist for generations. Preparedness frameworks must therefore include dedicated protocols for early detection, response personnel protection, environmental impact assessment, and coordinated communication with coastal communities and public health authorities.

Climate changes as a threat multiplier

Climate change does not constitute a source of marine pollution in itself, but it acts as a powerful and growing amplifier of every threat described in this chapter. Rising sea surface temperatures intensify water column stratification, reducing deep-water oxygenation and exacerbating the hypoxic conditions generated by eutrophication. Changing precipitation patterns alter the timing and intensity of riverine nutrient and contaminant inputs. More frequent and intense storm events enhance coastal erosion and the resuspension of contaminated sediments. Warming waters favour the proliferation of harmful algal bloom species and extend the geographic range of invasive organisms. Climate change is intensifying the impacts of pollution in the BS, leading to rising temperatures and heightened risks of waterborne diseases, threatening both ecosystems and communities.

These interactions mean that preparedness and response frameworks calibrated to historical conditions will become progressively inadequate as climate-driven change accelerates. Training programs developed under this RAP must incorporate climate-adaptive elements that equip stakeholders to anticipate evolving risk profiles, and not merely to react to the pollution scenarios of the past.

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CHAPTER II

IDENTIFIED NEEDS FOR TRAINING FRAMEWORKS IN THE BLACK SEA

The BSB faces a compounding set of pollution threats, eutrophication, heavy metals, persistent organic pollutants, emerging contaminants, marine litter, oil pollution, radioactive contamination, conflict-related pollution, invasive species, and climate-amplified hazards, that are transboundary in character and demand a coordinated, multi-hazard approach to preparedness and response. This chapter identifies the principal gaps between current training capacity and the demands of the evolving pollution landscape, addressing both the institutional conditions required to sustain an effective regional framework and the specific substantive and operational gaps in training content, methodology, and reach that such a framework must systematically address.

A functioning regional training framework presupposes a regional institutional foundation that does not yet exist. Training efforts across the basin are almost entirely project-driven, meaning that curricula, tools, networks, and standards developed through one funding cycle are rarely maintained or updated beyond its conclusion. Responsibilities are distributed across multiple national authorities without a common framework defining shared standards or coordination obligations, and regional bodies such as the Black Sea Commission (BSC) provide a political platform but have limited operational training coordination capacity. The result is a fragmented landscape in which good practices rarely diffuse across borders, joint exercises are organised ad hoc, and training quality and coverage vary widely. Addressing this requires a dedicated regional coordination entity or mechanism, whether anchored within an existing regional body or established as an independent structure, with a clear mandate, sustainable funding independent of project cycles, and the operational capacity to coordinate curriculum development, maintain shared tools and repositories, and facilitate a sustained regional exercise programme. This institutional need is the enabling condition for all other needs identified here.

At the level of training content, one of the most persistent gaps is the near-exclusive orientation of emergency response curricula and contingency plans toward oil spill response, while the actual pollution landscape involves simultaneous and interacting threats spanning nutrients, heavy metals, POPs, radioactive substances, plastics, and conflict-derived contaminants. The investigation into the grounding of the Vera Su vessel on the Bulgarian coast found that no legal or procedural framework regulated institutional action for accidents involving pollutants other than oil, a structural gap that remains unaddressed across the region. Training must therefore extend to compound pollution scenarios, cover the full range of legally relevant pollutant categories, and equip multi-agency response structures with clear coordination hierarchies that do not leave gaps when the incident does not fit the oil spill template.

Closely related is the need for training frameworks that are genuinely responsive to the evolving pollution landscape rather than calibrated to a fixed baseline. The threats facing the BS do not remain constant, and training content that is not regularly reviewed and updated against current conditions progressively loses operational relevance. This applies across all pollution categories: the science of emerging and poorly regulated contaminants, PFAS, pharmaceutical residues, microplastics, endocrine-disrupting compounds, continues to evolve, and training in the analytical methods and regulatory frameworks governing them must keep pace. The radiological risk profile of the basin can shift rapidly, as the persistent security threat to the Zaporizhzhia nuclear power plant demonstrates; where no training provision yet exists for such a scenario, its absence cannot be allowed to persist. Climate change deserves particular attention in this context, as it systematically alters the behaviour, distribution, and impact of every pollutant already present, intensifying hypoxia, modifying riverine contaminant inputs, favouring harmful algal blooms, and extending the range of invasive species, meaning that a training framework that does not account for climate-pollution interactions

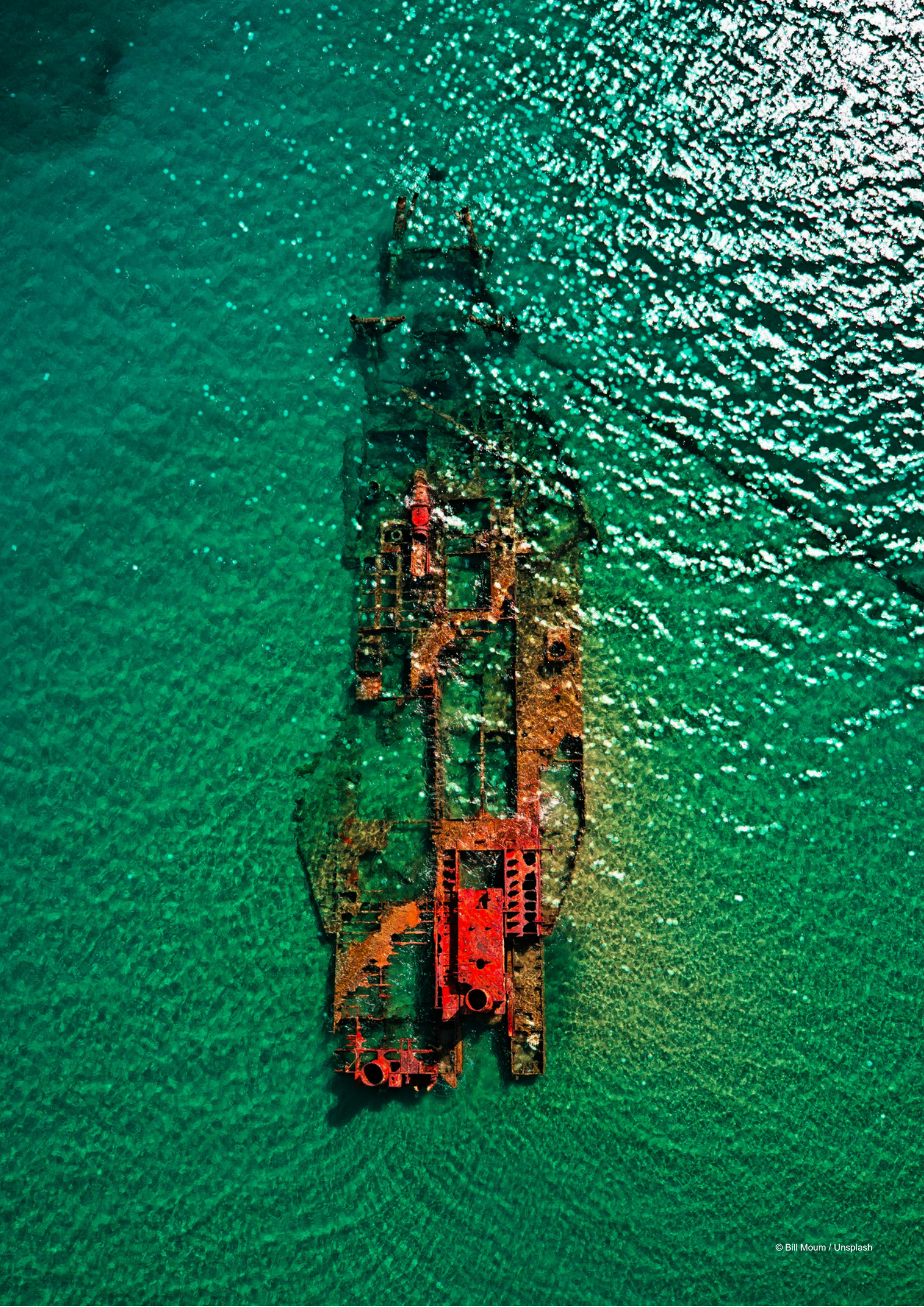
will produce responders calibrated to a risk profile that is progressively diverging from reality.

The conflict-related pollution dimension requires the most immediate and substantive response. The armed conflict in Ukraine has introduced a category of marine pollution hazard that no existing regional framework was designed to address: the simultaneous destruction of oil infrastructure, industrial facilities, wastewater treatment systems, and critical hydraulic infrastructure generates compound contamination scenarios whose scale, pace, and geographic extent defy conventional response protocols. The destruction of the Kakhovka Dam in June 2023 is the most severe acute pollution incident in the BS in recent decades, and sea mines drifting to Bulgarian and Romanian shores have added a further hazard dimension with no precedent in existing plans. Training must therefore address the identification and initial response to conflict-generated pollution events, civil-military coordination across national boundaries under conditions of restricted access, the use of remote sensing and satellite tools as operational substitutes for in-situ monitoring, and the legal and liability dimensions of conflict-derived pollution under international law.

Across all of these content areas, the effective use of modern digital tools remains a critical and underdeveloped capacity. Earth observation platforms, AI-assisted decision support systems, numerical dispersion modelling, and early warning systems are widely recognised as essential but systematically underutilised. Tools already available to the region often remain underused due to insufficient training, and the absence of dedicated decision support systems is identified across multiple countries as a direct cause of incomplete decision-making during incidents. Building competence in these tools, alongside FAIR data management practices and the use of shared regional data portals, is a prerequisite for the kind of real-time, cross-border coordination that transboundary pollution events demand.

That coordination also depends on overcoming the institutional fragmentation within which training currently occurs. Maritime administrations, environmental agencies, civil protection units, scientific institutions, and NGOs each possess knowledge and capabilities that are essential to an effective response, yet they rarely train together and their roles during incidents are inadequately defined. Post-incident investigations have consistently identified absent or unclear inter-institutional hierarchies as a direct operational failure. Joint exercises, cross-sector training programmes, and structured knowledge exchange between scientific monitoring institutions and operational response authorities are necessary to translate individual institutional capacity into effective collective action across national boundaries.

Finally, two further gaps deserve explicit recognition. Coastal communities are among the populations most directly affected by marine pollution, through contaminated seafood, beach and fisheries closures, and conflict-generated hazards, yet they remain largely absent from preparedness and response frameworks. The potential of citizen science to supplement institutional monitoring, to provide early incident notification, and to extend the geographic coverage of surveillance networks is largely untapped and warrants dedicated training investment. Equally, marine pollution events regularly produce wildlife emergencies, cetacean mortality, seabird strandings, that require specialised response competencies distinct from human-safety and clean-up operations. No dedicated training provision exists for this across the riparian states, and no protocols currently integrate wildlife response into institutional emergency plans.



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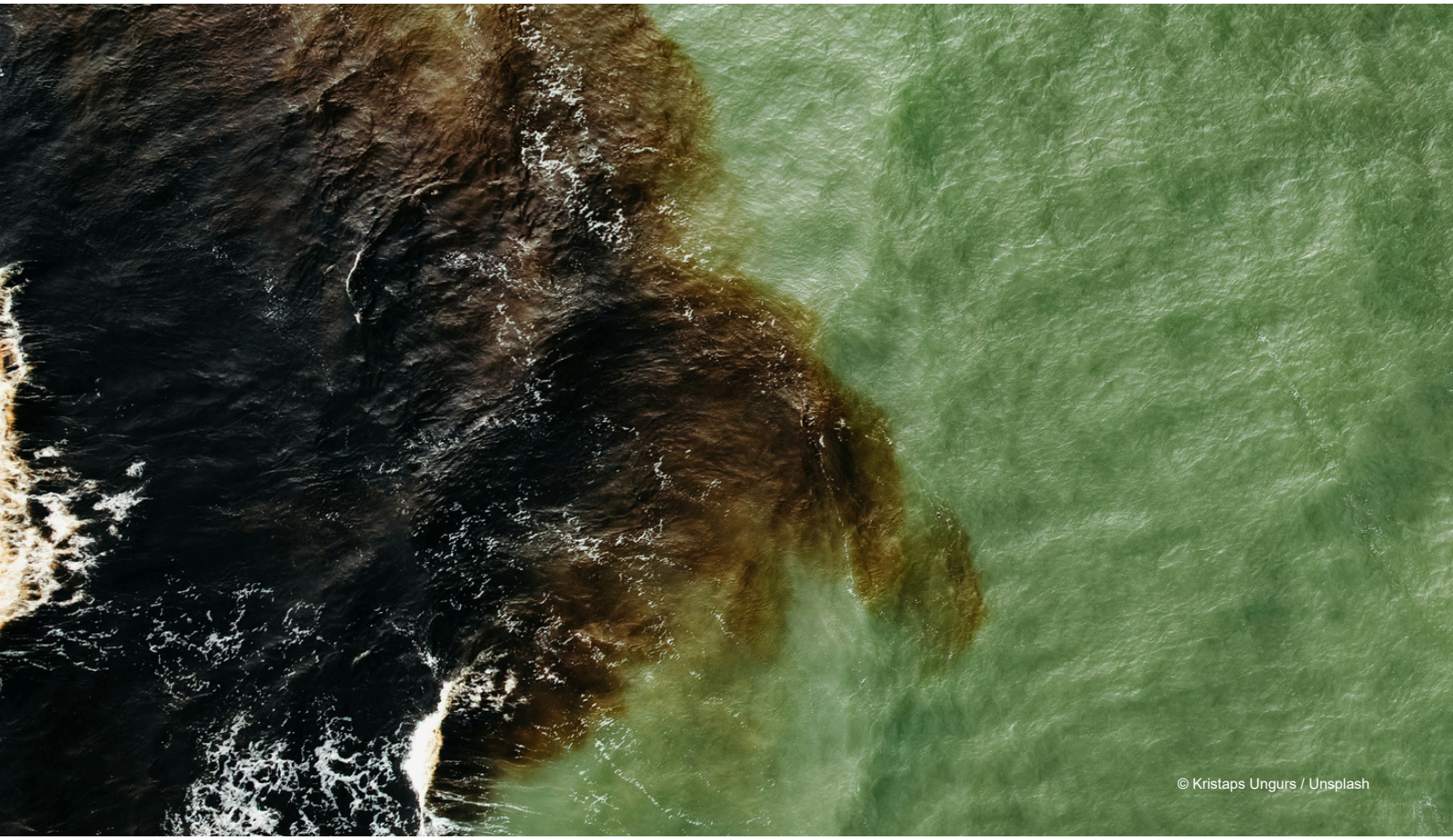
CHAPTER III

OBJECTIVES OF THIS REGIONAL ACTION PLAN

Building on the threat assessment and the identified training needs set out in the preceding chapters, this RAP pursues a clear and focused objective: to establish a common conceptual and operational framework across all BS coastal countries for the development and sustained delivery of training in marine pollution preparedness and response. In doing so, it aims to ensure that all riparian states have functional contingency planning and coordination mechanisms, to support the institutional developments needed to sustain long-term joint training activities beyond individual project cycles, and to integrate the full range of marine pollution sources, including emerging, conflict-related, and climate-amplified threats, into a monitoring, management, and training scene that is fit for current and future conditions.

Two strategic goals give direction to all actions proposed under the RAP. The first is to encourage regional cooperation and advanced training in the monitoring and management of both familiar and emerging marine pollution sources, with particular attention to the novel and severe challenges posed by pollution arising from armed conflicts. The second is to facilitate training, knowledge exchange, and cooperation among coastal countries, again with a specific focus on marine pollution incidents resulting from armed conflicts, a category of hazard that has moved from hypothetical to operational reality in the BSB and for which coordinated regional capacity remains critically underdeveloped.

Together, these goals position the RAP as both a training instrument and a regional cooperation framework. It seeks to create the conditions for a permanent regional platform through which information and expertise, operational, technical, scientific, legal, and financial, can be exchanged on a sustained basis, fostering dialogue and coordinated action at national, regional, and global levels. The RAP translates these ambitions into specific, assignable actions with defined responsibilities, timelines, and measurable targets, while remaining a living document designed to evolve alongside the pollution landscape and the capacities of the states it serves.



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CHAPTER IV

METHODOLOGY FOR THE DEVELOPMENT OF THIS RAP

The present RAP was developed through a structured, evidence-based process designed to ensure that its strategic objectives and priority actions are grounded in a rigorous understanding of the current situation across the BSB and are directly responsive to the needs and capacities of the institutions and communities they are intended to serve.

The process began with a comprehensive baseline analysis covering the full range of factors that define the current state of marine pollution preparedness and response in the region. This encompassed the identification and characterisation of marine pollution types and sources present in the BSB, the linkages between them, and their ecological, human health, and socioeconomic impacts. It also included a systematic review of the existing preparedness and response frameworks, operational, institutional, and legal, at the national, regional, European, and international levels, examining governance structures, the mandates and capacities of relevant organisations and institutions, and the landscape of stakeholders engaged in or responsible for monitoring, management, and emergency response. This phase drew on published scientific literature, policy and regulatory documents, and the direct inputs of national experts and institutional representatives from across the basin, ensuring that the baseline reflected both the formal frameworks in place and the operational realities behind them.

On the basis of this analysis, the principal needs, requirements, gaps, and good practices were identified, spanning institutional governance, training content and methodology, regulatory harmonisation, operational coordination, and technological capacity. This diagnostic phase was deliberately broad, recognising that marine pollution preparedness is a cross-sectoral challenge that cannot be addressed through a single institutional lens, and that the gaps most in need of action are often those that fall between existing mandates rather than within them.

The identified needs and gaps informed the Strategic Goals of the RAP, which define its overarching objectives and provide a basis for measuring success. These goals were formulated to reflect both the immediate operational priorities of the region and the longer-term ambition of building a self-sustaining regional framework for training, coordination, and knowledge exchange in marine pollution preparedness and response.

The Strategic Goals were subsequently translated into specific priority actions, each aligned with identified needs and requirements and with national, regional, and European policy goals. For each action, the RAP identifies the entities and stakeholders whose involvement is required, a proposed timeline for implementation, and indicators of success and measurable targets against which progress can be tracked. This structure is intended to give the RAP practical effect: each action represents a commitment that can be assigned, resourced, monitored, and evaluated.

Stakeholder feedback was systematically integrated throughout the RAP development process. A regional consultation workshop was organised to present the initial structure of the RAP to key institutional stakeholders, gather their feedback on priorities and feasibility, and ensure that the resulting framework would have the operational buy-in and institutional support needed to generate real impact. Details of the regional consultation process and its outcomes can be found in Section the RESPONSE regional consultation workshop and the Appendix.

The RAP is conceived as a living framework that can evolve in response to changing pollution risks, institutional developments, and regional capacities. It is also explicitly designed for integration into broader regional policy processes, and particular effort has been made to align its objectives and actions with any future update of the Strategic Action Plan for the Environmental Protection and Rehabilitation of the BS, ensuring that the regional training and coordination framework it proposes both contributes to and is reinforced by the broader agenda of BS environmental governance.

THE RESPONSE REGIONAL CONSULTATION WORKSHOP ON THE REGIONAL ACTION PLAN FOR CAPACITY BUILDING IN MARINE POLLUTION EMERGENCY PREPAREDNESS AND RESPONSE

A World Café workshop was organised as part of the RESPONSE regional consultation workshop to gather participants' views and provide input to the RAP for Capacity Building in Marine Pollution Emergency Preparedness and Response. The workshop was followed by an interactive discussion on the conditions, challenges, and actions necessary to achieve the objectives of the RESPONSE project.

The RESPONSE World Café workshop

The World Café method is a participatory engagement and dialogue approach that enables groups of people to explore issues of shared interest through a series of structured conversations. Developed as a collaborative process for knowledge sharing and collective learning, it is based on the principle that meaningful discussions can generate insights, strengthen mutual understanding, and support the development of shared solutions. Rather than relying on traditional presentations or interviews, the method creates an informal, café-style environment in which participants engage in small-group discussions around specifically designed questions.

A key feature of the World Café is the rotation of participants between discussion tables. During successive rounds of conversation, participants move from one table to another while a designated table host remains in place to facilitate the discussion and provide continuity. This process allows ideas, experiences, and perspectives to circulate across groups, facilitating the sharing of perspectives and enabling participants to build upon previous discussions. The method is particularly valuable for exploring complex topics that benefit from multiple perspectives and collective reflection.

The World Café approach has been widely used in research, policy development, organisational learning, stakeholder consultation, and community engagement. Its strengths include fostering inclusive participation, encouraging dialogue among diverse stakeholders, identifying common priorities, and generating collective insights within a relatively short period of time. The method is especially suitable when the objective is not only to gather individual opinions but also to facilitate shared understanding and collaborative thinking around challenges, opportunities, and future actions.

Within the World Café organised within the RESPONSE regional consultation workshop, participants were divided into three groups and engaged in discussions at three thematic tables, each facilitated by a host. Through a rotation process, all groups reviewed and discussed the same set of topics, while hosts remained at their tables to summarise previous discussions and record key observations, comments, and recommendations.

The discussions focused on the activities proposed under the RAP's five thematic categories: (1) institutionalisation, policy and regulation; (2) training processes and capacity building; (3) operational preparedness and exercises; (4) digitalisation and knowledge management; and (5) raising awareness. Participants assessed the proposed activities according to three criteria: implementation timeframe (short-, medium-, or long-term), level of priority (low, medium, or high), and feasibility (easy to implement, difficult, or very difficult). Participants were also invited to provide comments, identify implementation challenges, suggest additional activities, and propose improvements.

Following the group discussions, the table hosts presented summaries of the main findings to the plenary session. The subsequent discussion focused on priorities for implementation, enabling conditions, potential obstacles and risks, and actions required to achieve the RAP objectives. The

World Café process generated valuable stakeholder input, helping to identify priority actions, implementation considerations, and policy-relevant recommendations that will contribute to the refinement of the RAP and support future policy development within the RESPONSE project.

Summary of World Café findings and recommendations

The comments, suggestions, and observations provided by participants during the World Café discussions were highly relevant and offered valuable insights for the development and implementation of the RAP. Their contributions offered valuable stakeholder perspectives on the proposed activities, implementation priorities, feasibility considerations, and potential challenges. The main points and conclusions emerging from the discussions can be summarized as follows:

The World Café discussions revealed broad agreement among participants regarding the importance of strengthening regional capacity for marine pollution preparedness and response in the BS region. Across all thematic categories, stakeholders consistently assigned high priority to the proposed actions, while also recognizing that many of them would require medium- to long-term implementation efforts due to institutional, political, technical, and financial challenges.

A recurring theme throughout the discussions was the need for stronger institutional arrangements and governance mechanisms at both national and regional levels. Participants emphasized that successful implementation of the RAP will require active engagement of national governments, regional organisations, and decision-makers. The establishment of a permanent regional coordinating body, supported by formal agreements and sustainable funding mechanisms, was considered essential for ensuring continuity and long-term commitment.

Stakeholders highlighted the importance of developing a coherent regional framework for training coordination, capacity building, and knowledge exchange. While the design of training programmes, workshops, and guidance materials was generally regarded as feasible, integrating these initiatives into national institutional, legislative, and regulatory systems was perceived as considerably more challenging. Participants stressed that harmonised training standards, long-term institutional support, and collaboration among BS countries are necessary to achieve sustainable capacity development.

Operational preparedness and response exercises were identified as key elements for improving regional readiness. Participants underlined the importance of maintaining regular training exercises, strengthening networks of specialists, and harmonising national contingency planning approaches. Particular attention was drawn to emerging threats, including pollution incidents linked to armed conflicts and new categories of pollutants. Building on existing successful practices and ensuring adequate financial support were considered critical factors for success.

Digitalisation and knowledge management emerged as areas with significant potential for strengthening regional cooperation. Participants strongly supported the establishment of a Regional Training Repository, digital knowledge-sharing tools, and a regional e-platform for incident reporting, surveillance, and decision support. However, they emphasized that these initiatives should build upon existing systems, avoid duplication of efforts, ensure interoperability, and be supported by clear governance arrangements and long-term maintenance plans.

In relation to public awareness and community engagement, participants recognised the need for coordinated regional communication efforts aimed at fostering a culture of prevention and preparedness. They highlighted the importance of sustained, long-term awareness-raising activities tailored to different target audiences and delivered through a variety of communication channels.

Across all thematic areas, several common enabling factors emerged. These included the need for sustainable funding, strong political commitment, clearly defined institutional

roles and responsibilities, effective regional coordination, stakeholder engagement, and long-term governance mechanisms. At the same time, participants identified a number of barriers, including institutional fragmentation, limited resources, complex political processes, and challenges associated with integrating regional initiatives into national frameworks.

Overall, the World Café discussions demonstrated strong stakeholder support for the objectives of the RAP while providing valuable insights into implementation priorities, enabling conditions, and potential obstacles. These findings offer an important foundation for refining the RAP and informing future policy recommendations aimed at strengthening marine pollution preparedness and response across the BS region.

Interactive discussion with stakeholders - Summary

Following the World Café discussions the stakeholders were engaged in an interactive discussion about the conditions and actions necessary to achieve the RESPONSE project objectives applying the related EU policy documents - the CMA for the BS and the MSFD both calling for the sustainable use and recovery of marine resources towards achieving a Good Environmental Status (GES) for the BS - as the means to support healthy and resilient seas and foster integrated marine governance.

The path to achieve those objectives relies on our capacity to support advanced training schemes on marine pollution preparedness and response and on our ability to measure, map, and monitor the status, the functioning, and the threats to the marine ecosystems at relevant temporal and spatial scales.

The questions for consultation focused on the following topics: the challenges and barriers to develop and apply advanced training schemes; and the steps needed to successfully support advanced innovative training schemes on marine pollution preparedness and response and ensure their uptake.

The discussion highlighted a range of challenges affecting the implementation and long-term maintenance of advanced training schemes for marine pollution preparedness and response in the Black Sea region. Participants identified insufficient expert and human capacity, institutional weaknesses, limited training infrastructure and equipment, and financial constraints as major obstacles. Frequent changes in government priorities, legislative instability, and limited application of environmental democracy, particularly in transboundary contexts, were also considered important challenges.

The most significant barrier to regional cooperation and cross-border implementation of training activities was identified as the ongoing geopolitical tensions and armed conflict in the region. Participants noted that restrictions on cooperation, data exchange, mobility, and communication, together with the limited functioning of regional cooperation mechanisms, have reduced opportunities for joint action. Conflicting economic, social, and environmental priorities, as well as declining public engagement with environmental issues, were also seen as barriers to effective regional collaboration.

Participants unanimously stressed the importance of stronger involvement of national governments, policy makers, maritime administrations, and civil protection authorities. Marine pollution preparedness and emergency response should be elevated on national and regional policy agendas, supported by stronger institutional coordination and sustained political commitment. Enhanced cooperation among Black Sea countries was considered essential, particularly through joint monitoring initiatives, regular data exchange, continuous communication among competent authorities, and the organisation of joint exercises. Existing examples of cooperation and resource-sharing were identified as useful models for future regional collaboration.

The discussions also emphasized the need for training curricula to evolve in response to emerging marine pollution threats. Particular attention should be given to pollution arising from armed conflicts, hydrocarbon pollution, hazardous substances, persistent chemicals, and pollution hotspots. Participants

highlighted the growing importance of Earth Observation, satellite monitoring, digital tools, and community-based monitoring approaches, including citizen and volunteer participation. Raising public awareness and strengthening community engagement were regarded as integral components of future training programmes.

To ensure successful integration of advanced training schemes into national systems, participants recommended closer involvement of universities and research institutions in curriculum development, training delivery, and capacity-building activities. Adequate funding mechanisms, institutional support, and incentives for participation were considered essential prerequisites. While participants recognised the potential contribution of NGOs, experts, and private-sector actors, they generally viewed national governments as the primary actors responsible for establishing and sustaining training frameworks.

The long-term sustainability of advanced training schemes was regarded as one of the most challenging objectives. Participants stressed that sustainable financing, stronger institutional coordination, and clear governance arrangements would be necessary to maintain training programmes beyond project lifetimes and to support continuous evaluation, updating, and improvement.

Success was broadly defined as the establishment of an effective, accessible, and sustainable system that supports preparedness, decision-making, and emergency response across the BS region. Key indicators of success include strong stakeholder participation, widespread awareness and use of training tools, effective integration into institutional practice, transparency of information, and the ability of authorities to provide timely warnings, guidance, and support during marine pollution incidents. Participants also emphasized that success should ultimately be reflected in improved preparedness, stronger regional cooperation, and enhanced capacity to respond to both existing and emerging marine pollution threats.

The stakeholder feedback generated through the World Café and subsequent discussions played a key role in revising and strengthening the proposed Priority Actions of the RAP. The final version of the RAP incorporates these insights, ensuring that it reflects regional needs, stakeholder priorities, and the operational realities of capacity building for marine pollution preparedness and response in the BS region.

For further details on the World Café discussions, including participants' assessments, comments, recommendations, and the findings of the subsequent interactive discussion session, please refer to the Appendix.

A glimpse of the RESPONSE World Café workshop

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CHAPTER V

PRIORITY ACTIONS

The following chapter sets out the priority actions proposed under this RAP for building and sustaining a regional framework for marine pollution preparedness and response training across the BSB.

The actions are organised into five thematic categories:

- institutionalisation, policy, and regulation;
- training process and capacity building;
- operational preparedness and exercises;
- digitalisation and knowledge management;
- raising awareness.

Together, these categories reflect the understanding that effective regional preparedness cannot be achieved through training content alone, it requires the institutional foundations to sustain it, the operational mechanisms to test it, the digital tools to support it, and the public engagement to embed it.

Each action is presented with a clear objective and description, a set of anticipated outputs, proposed indicators of success, and guidance on the timeframe and level of priority for implementation.

This structure is intended to make the actions directly usable by national authorities, regional bodies, and other stakeholders as a basis for planning, funding applications, and inter-institutional agreements.

The actions are proposed rather than prescriptive. They represent a framework of recommended interventions grounded in the needs and gaps identified in the preceding chapters, but their adoption, sequencing, and scope of application remain at the discretion of the relevant national and regional actors. While a number of the actions are designed to be mutually reinforcing, and will deliver greatest impact when pursued in combination, each has been formulated to be sufficiently self-contained to be implemented independently, adapted to specific national contexts, or phased according to available resources and institutional readiness. The aim is to offer a flexible but coherent menu of actions from which riparian states and regional bodies can draw, according to their priorities and capacities, in the shared pursuit of a more prepared and resilient BS region.

Category 1: Institutionalization, policy, and regulation

1.1 Support institutional developments for sustainable & long-term joint response training activities

Objective

To establish and strengthen the institutional foundations required to sustain long-term, coordinated joint training activities for marine pollution preparedness and response across the BSB, by building governance structures, formalising inter-institutional arrangements, and ensuring adequate and durable funding mechanisms.

Description

This action addresses one of the most critical gaps identified across the BSB: the absence of stable, formally recognised institutional structures capable of sustaining joint training activities beyond the lifecycle of individual projects. While significant training initiatives have been undertaken through project-based cooperation, their long-term impact is frequently limited by the lack of institutional anchoring, predictable funding, and clearly assigned responsibilities for continuity.

Therefore, the action focuses on building the institutional conditions necessary to transition from project-driven training efforts to a self-sustaining regional framework. This includes: defining and formalising the mandates of relevant national and regional institutions in relation to joint training; establishing or designating a coordinating body or mechanism at the regional level (building on the institutional architecture proposed under Priority Action 1.2); developing formal inter-institutional agreements between relevant regional bodies to provide a legal and operational basis for ongoing cooperation; and identifying and securing sustainable funding pathways, including through integration into national budgets, regional programmes, and EU funding instruments.

Particular attention will be given to embedding training responsibilities into the institutional mandates of key national authorities, including environment ministries, coast guard services, transport authorities, and civil protection agencies, so that joint regional training activities are recognised as a core function rather than an ad hoc commitment. Where appropriate, existing regional governance structures such as the BSC will be leveraged to provide an overarching institutional home for these arrangements, ensuring political legitimacy and continuity across changes in national administrations or project funding cycles.

Time required to implement	Priority
Mid-term (>5-10 years) to Long-term (>10 years)	High

Feasibility

Yellow (quite difficult) to Red (difficult)

Anticipated outputs	Proposed indicators of success
Formalised institutional mandates for joint training	Number of institutions with training embedded in mandates
Signed inter-institutional agreements	Percentage of training activities funded through stable, non-project sources
Integration of training into national policies and budgets	Inclusion of training in national budgets and regional programmes
Identified and secured long-term funding sources	Number of formal agreements signed

Involved stakeholders

- National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response
- Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response
- Black Sea Commission (BSC)
- Black Sea Economic Cooperation (BSEC)
- BS Memorandum on Port State control
- International Commission for the Protection of the Danube River (ICPDR)
- UNEP/MAP (Barcelona Convention)
- European Maritime Safety Agency (EMSA)
- European Environment Agency (EEA)

1.2 Build a coherent institutional architecture for training coordination

Objective

To establish a coherent institutional architecture dedicated to the coordination, development, and long-term maintenance of a regional training framework for marine pollution preparedness and response, by clarifying roles, strengthening inter-institutional cooperation, and exploring formal governance models at the BSB level.

Description

This action aims to map and clarify the roles, responsibilities, and cooperation flows between the key institutional actors involved in marine pollution preparedness and response training across the BSB, including national authorities (environment, transport, coast guard, civil protection, and port authorities), EU agencies (EMSA, EEA), the BSC, and relevant regional initiatives. Based on this mapping, the action will develop concrete proposals for strengthening multi-level governance and inter-institutional coordination for training at the regional level.

A central output of this action is the design of an institutional entity/mechanism responsible for the coordination, development, and long-term maintenance of the regional training framework. This entity or mechanism could take the form of a dedicated regional initiative, drawing on examples of good practice from comparable regional seas, such as MedPAN in the Mediterranean, as models for its governance and operational design. The most appropriate model will be assessed and agreed upon through a participatory process involving all relevant stakeholders and riparian states.

The entity should be equipped to fulfil core functions including: coordinating training curricula development and update; maintaining digital tools as the regional Hub for Marine Pollution Preparedness and Response (Action 3.1), the Regional Training Repository (Action 4.2) and the Regional E-Platform and smartphone application for incident reporting, surveillance & decision support (Action 4.3); facilitating the regional exercise programme; supporting through training the contingency plan harmonisation; building and maintaining strategic networks; fostering international knowledge exchange; and increasing public awareness and engagement. Its establishment will be supported by appropriate governance structures, funding mechanisms, and formal inter-institutional agreements and processes described in Action 1.1.

Time required to implement	Priority
Mid-term	High

Feasibility

Yellow to Red

Anticipated outputs	Proposed indicators of success
Governance model options for a regional training coordination entity/mechanism Agreed institutional architecture and mandate Formal cooperation agreements between key institutions Operational framework for managing training tools, platforms, and programmes Roadmap for long-term sustainability (funding, staffing, governance)	Formal establishment of the coordination entity with defined mandate Number of signed inter-institutional agreements Operational regional training platforms and tools maintained Number of coordinated training sessions and exercises per year Measurable improvement in regional response readiness (e.g. joint exercise evaluations)

Involved stakeholders

- National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response
- Training institutions & research centers
- NGOs and civil society organizations
- Private sector (shipping, oil industry, port operators)
- Black Sea Commission (BSC)
- Black Sea Economic Cooperation (BSEC)
- BS Memorandum on Port State control
- International Commission for the Protection of the Danube River (ICPDR)
- UNEP/MAP (Barcelona Convention)
- European Maritime Safety Agency (EMSA)
- European Environment Agency (EEA)

1.3 Strengthening regional regulatory frameworks

Objective

To strengthen regional regulatory frameworks for marine pollution monitoring and response by supporting capacity building through structured training frameworks, while ensuring alignment with international standards.

Description

Currently, in BSB the laws for monitoring and reporting pollution differ significantly from country to country, often falling short of international or EU standards. This action aims to address that gap by delivering targeted training and capacity building activities that support national authorities in strengthening, updating, and harmonising their regulatory frameworks.

Training will focus on building the knowledge and competencies needed to understand, apply, and where necessary adapt national regulatory instruments in line with key international frameworks, including the Bucharest Convention and its Protocols, MARPOL and relevant EU Marine Strategy Framework Directive (MSFD) requirements. Particular attention will be given to regulatory gaps related to emerging pollution types, including hazardous and noxious substances (HNS), conflict-related pollution, and novel contaminants, which are insufficiently addressed in many existing national frameworks.

The action will also support the development of harmonised regional standards and procedures for marine pollution monitoring and reporting, building on the common methodological baseline promoted across the RAP. Training will equip national regulatory authorities, environmental agencies, and relevant institutions with the tools and knowledge needed to translate international commitments into operational national legislation and enforceable regulatory instruments.

Structured training workshops, delivered both in-person and through the Regional Training Repository (Action 4.2), will be the primary delivery mechanism, complemented by peer-to-peer learning exchanges between riparian states and engagement with international regulatory bodies and experts. The action will also promote the integration of training framework outputs into formal regulatory and legislative processes, supporting their recognition as reference standards at the national level.

Long-term sustainability will be pursued by embedding regulatory capacity building into institutional mandates and by fostering ongoing dialogue between training providers, regulatory authorities, and policymakers across the BSB.

Time required to implement	Priority
Mid-term	High

Feasibility

Yellow to Red

Anticipated outputs	Proposed indicators of success
Training modules on international regulatory frameworks and compliance	Number of officials trained on international regulatory frameworks
Capacity-building workshops and peer-learning exchanges	Increased compliance with frameworks such as MARPOL and MSFD
Reference toolkit for regulatory authorities (methods, procedures, best practices)	Number of peer-learning exchanges and cross-country collaborations
	Evidence of integration of training outputs into national regulatory processes

Involved stakeholders

- National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response
- Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response
- Local authorities - coastal municipalities
- Research institutions & Universities
- Training centers
- International bodies (e.g. International Maritime Organization)
- Black Sea Commission (BSC)
- European Maritime Safety Agency (EMSA)
- European Environment Agency (EEA)

Category 2: Training process & capacity building

2.1 Increase & strengthen capacity at the BSB level

Objective

To equip relevant organizations, institutions, and individuals across the BSB with skills, knowledge, and resources required for effective marine pollution preparedness and response.

Description

Knowledge and expertise in marine pollution preparedness and response are unevenly distributed across the BSB. Bridging this gap through targeted and effective skills transfer is therefore a fundamental step toward achieving the goals and objectives of this RAP. Training efforts must be diverse, continuously updated, and tailored to the specific needs of different stakeholders, addressing challenges at both the national and institutional levels. This includes equipping relevant actors with the knowledge and skills required to design and deliver effective training schemes and frameworks, as well as providing them with the tools to adopt and integrate innovative methods in monitoring, early warning, modelling, simulation, and marine pollution incident management and response.

At the same time, the training frameworks should pursue a dual purpose. On one hand, they will be designed to be flexible and responsive, adapted to the distinct needs, requirements, and capacities of different target groups, recognizing that these may vary considerably between countries. While some may require very specific capacity-building interventions, others may be well-positioned to play an active role in regional knowledge exchange, offering sub-regional training opportunities and sharing best practices.

On the other hand, the frameworks should also seek to promote a degree of harmonisation and unification of training standards across the BSB, an operational necessity, not merely a technical aspiration. Marine pollution incidents frequently cross national boundaries, affecting multiple countries over extended periods, making a common baseline of competencies, shared methodological standards, and the coordinated use of innovative tools (e.g. EO technologies), essential for effective joint preparedness and response. By combining contextual adaptability with regional convergence, the training frameworks aim to make meaningful cross-border cooperation both possible and sustainable.

Ultimately, this strategy should aim to translate the newly developed training frameworks into systematised legislative, regulatory, and management actions that generate direct and lasting capacity-building benefits across the region.

Time required to implement	Priority
Mid-term to Long-term	Medium to High

Feasibility
Yellow to Red

Anticipated outputs	Proposed indicators of success
Comprehensive regional training framework with adaptable modules Capacity-building programmes for diverse stakeholder groups Harmonised baseline competencies and training standards across BSB Strengthened regional knowledge-sharing and sub-regional training hubs	Number of individuals and institutions trained across BSB Establishment of regional and sub-regional training hubs Adoption of common training standards and competency frameworks Increased use of innovative tools in monitoring and response Number of cross-border training activities and exchanges Measurable improvement in preparedness and response performance (e.g. exercises, real incidents)

Involved stakeholders	
National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response Local authorities - coastal municipalities, other smaller local authorities Research institutions & Universities	Training centers Ports & coastal infrastructure NGOs & technical experts Private sector (shipping, offshore industry, technology providers) Black Sea Commission (BSC) European Maritime Safety Agency (EMSA) European Environment Agency (EEA)

2.2 Strategic networks & international knowledge exchange

Objective

To strengthen regional and international expertise exchange in contingency planning and coordination, through active networks that integrate cutting-edge technologies and good practices into national training frameworks, ensuring regional preparedness keeps pace with global maritime security developments.

Description

This action focuses on connecting the BS region with the broader global maritime community, facilitating the exchange of knowledge, good practices, and lessons learned with international organisations, networks, and institutions working in the field of marine pollution response and maritime security. Through active international engagement, it supports the integration of cutting-edge technologies and innovative methodologies into national and regional frameworks, ensuring that BS preparedness evolves in step with global developments.

Key mechanisms for advancing this exchange include high-level networking workshops, joint publications, participation in international fora, and the establishment of formal partnerships with relevant international bodies, including EMSA, IMO, and other regional sea conventions. These activities will also serve to raise the profile of the BS region within the global marine pollution response community and to attract external expertise and resources in support of regional capacity building.

A structured remote advisory mechanism, utilising video conferencing and digital communication platforms, will support first responders and national authorities during actual marine pollution events, providing real-time expert guidance and bridging the gap between training and operational response. This mechanism will complement the online training and knowledge-sharing infrastructure developed under Action 4.2 Regional Training Repository & Knowledge Bank, which serves as the primary platform for training materials, curricula, and the blended learning programme.

Long-term sustainability of this network will be pursued through the formalisation of partnerships via officials or unofficial agreements and the integration of knowledge exchange activities into the institutional mandates of participating organisations, ensuring continuity beyond individual project cycles.

Time required to implement	Priority
Mid-term to Long-term	Medium to High

Feasibility

Yellow to Red

Anticipated outputs	Proposed indicators of success
Established a regional and international expert network Formal partnerships with key international organisations Regular knowledge exchange events (workshops, fora, joint publications) Operational remote advisory mechanism for real-time incident support Integration of global best practices and technologies into regional frameworks Increased visibility of BSB in global marine pollution response community	Frequency of knowledge exchange activities (events, publications) Participation of BSB stakeholders in international fora

Involved stakeholders

- National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response
- Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response
- Research institutions & Universities
- NGOs & private sector stakeholders
- Black Sea Commission (BSC)
- BS Memorandum on Port State control
- European Maritime Safety Agency (EMSA)
- European Environment Agency (EEA)
- International Commission for the Protection of the Danube River (ICPDR)
- International bodies (e.g. International Maritime Organization)
- UNEP/MAP (Barcelona Convention)
- Other regional sea conventions and international networks
- Technical experts

Category 3: Operational preparedness & exercises

3.1 Regional network of specialists & exercise calendar

Objective

To establish a regional network of specialists dedicated to joint training, exercises, pilot operations, and direct response, supported by a structured regional calendar of strategic, tactical, and operational exercises addressing transboundary marine pollution scenarios, including wildlife in distress and conflict-related incidents, through the coordinated use of innovative tools, simulations, and drills.

Description

This action focuses on the establishment and maintenance of a Regional Network of Specialists, a living roster of qualified experts drawn from Black Sea riparian states and representing the relevant institutions and organisations involved in marine pollution preparedness and response. The network should encompass expertise across key disciplines, including marine monitoring, pollution response, wildlife assessment and assistance, climate change adaptation, legal and regulatory frameworks, digital tools and technologies, equipment, and operational response management.

The Regional Network of Specialists is designed to function as a regional Hub (Hub for Marine Pollution Preparedness and Response), ensuring that the appropriate expertise is available when needed for advisory support, capacity building, technical assistance, and the coordination of cross-border response efforts. Particular attention should be given to maintaining up-to-date records of specialists' profiles, areas of expertise, institutional affiliations, and availability for deployment and training activities.

A key function of the Regional Network of Specialists will be the development and maintenance of a Regional Exercise Calendar, providing a structured and forward-looking schedule of joint simulation exercises, tabletop drills, and field-based response scenarios organised in collaboration with relevant national and regional entities. The network will coordinate the design, implementation, evaluation, and periodic review of these exercises, ensuring that lessons learned and after-action reviews are systematically incorporated into training programmes, operational procedures, and guidance materials, thereby supporting the continuous improvement of regional preparedness and response capacities.

Time required to implement	Priority
Mid-term to Long-term	Medium to High

Feasibility

Yellow to Red

Anticipated outputs	Proposed indicators of success
Operational Regional Network of Specialists (expert roster/database)	Number of registered and active specialists in the regional network
Functional regional Hub for Marine Pollution Preparedness and Response	Establishment and regular update of the exercise calendar
Structured Regional Exercise Calendar (strategic, tactical, operational levels)	Number and diversity of joint exercises conducted annually
Regular joint exercises (simulations, tabletop, field drills)	Participation rate of BSB countries in exercises
After-action review mechanism feeding into continuous improvement	Documented improvements from after-action reviews applied to plans and training
	Enhanced cross-border coordination during exercises and real incidents

Involved stakeholders

- National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response
- Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response
- Research institutions & Universities
- Wildlife rescue & environmental NGOs
- Black Sea Commission (BSC)
- Private sector (response contractors, offshore operators)
- European Maritime Safety Agency (EMSA)
- International Commission for the Protection of the Danube River (ICPDR)
- Military/naval authorities (for conflict-related scenarios)

3.2 Institutionalizing a regional training & exercise framework

Objective

To consolidate and institutionalise a permanent, multi-annual regional training and exercise framework across all BSB countries, synchronising technical, operational, and decision-making training through a structured exercise programme, built on the established Bravo Delta exercise series and aligned with the BSC and EMSA mechanisms.

Description

This action aims to establish and maintain a structured, multi-annual regional training and exercise framework based on common standards, harmonised guidelines, and shared operational procedures, while taking into account the specific capacities, needs, and institutional contexts of the BSB countries. The framework should build upon existing and well-established exercise formats using them as core mechanisms for testing, validating, and continuously improving regional response protocols and coordination arrangements.

Regular exercises are essential for strengthening regional preparedness and ensuring that operational frameworks, procedures, and coordination mechanisms remain effective and fit for purpose. They provide opportunities to identify gaps, improve interoperability among response actors, and ensure that national teams are capable of responding in a coordinated manner to marine pollution incidents. To reflect the evolving risk landscape of the BS region, exercises should be based on realistic and diverse scenarios, including transboundary pollution events and, in particular, incidents involving wildlife in distress and pollution arising from armed conflicts. These scenario types present unique operational, legal, logistical, and humanitarian challenges and should therefore be systematically incorporated into the framework to ensure that response teams are adequately prepared to address them.

Implementation of the framework should be supported through a formally agreed multi-annual exercise calendar (Action 3.1), with responsibilities distributed across BSB countries and progress reviewed on a regular basis through an appropriate regional coordination mechanism, such as the BSC. Strong alignment with the activities of the BSC and the EMSA should be maintained through close cooperation, joint exercises, and the use of shared protocols and methodologies. In addition, official agreements between participating states could provide the institutional basis for transforming the framework into a long-term regional commitment.

To ensure continuous improvement, lessons learned and after-action reviews from all exercises should be systematically captured, shared, and incorporated into the refinement of training curricula, operational plans, guidance materials, and response procedures, thereby strengthening the overall effectiveness and sustainability of regional preparedness and response capacities.

Time required to implement	
Mid-term to Long-term	Medium to High

Feasibility
Green (realistic) to Yellow

Anticipated outputs	Proposed indicators of success
Institutionalised multi-annual regional training and exercise framework	Number of exercises conducted under the multi-annual programme
Harmonised standards, procedures, and training curricula	Regular updates and adherence to the regional exercise calendar
Systematic inclusion of wildlife and conflict-related scenarios	Number of formal agreements signed between participating states
After-action review system linked to continuous improvement	Integration of lessons learned into training and operational plans
Formal agreements supporting long-term commitment	Demonstrated improvement in coordinated regional response capacity

Involved stakeholders	
National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response	Research institutions & Universities
Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response	Training centers
Local authorities - coastal municipalities, other smaller local authorities	Wildlife response organisations & NGOs
Associations of coastal & marine economic sectors	Ports and coastal infrastructure
	Black Sea Commission (BSC)
	European Maritime Safety Agency (EMSA)
	Experts

3.3 Harmonization & expansion of national contingency plans

Objective

To support BS countries through targeted training in developing, updating, and harmonising their national contingency plans, while expanding their scope to address hazardous and noxious substances (HNS), emerging pollution types, and conflict-related environmental emergencies.

Description

This action delivers targeted training to support national authorities across the BSB in developing, strengthening, updating, and harmonising their national contingency plans (NCPs). Training will cover alignment with international recognized procedures and operational mechanisms, including for example the Pollution Reporting System (POLREP), coordination structures, and roles of national competent authorities, as well as the expansion of NCPs beyond oil pollution to incorporate HNS response, emerging pollution types (emerging contaminants and radioactive contamination), conflict-related environmental incidents, and adaptation to climate change, which currently fall outside the scope of most existing plans.

Training will promote common methodologies, standardised formats, and harmonised procedures across riparian states, contributing to regional convergence in contingency planning. Where national plans are absent or significantly outdated, the action could also provide direct technical support during their development or revision.

Time required to implement	Priority
Mid-term to Long-term	Medium to High

Feasibility

Green (realistic) to Yellow

Anticipated outputs	Proposed indicators of success
Training modules on contingency planning, POLREP, and coordination mechanisms Standardised templates and common methodologies for NCP development Technical support provided for plan development/revision	Number of NCPs updated or newly developed Inclusion of HNS, emerging pollutants, and conflict-related scenarios in NCPs Adoption of common formats and procedures across BSB countries Level of cross-border compatibility between national plans Evidence of improved response coordination during exercises and real incidents

Involved stakeholders

- National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response
- Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response
- Black Sea Commission (BSC)
- Research institutions & Universities
- Training centers
- European Maritime Safety Agency (EMSA)
- International Maritime Organization
- Legal & technical experts in contingency planning

Category 4: Digitalization & knowledge management

4.1 Regional training roadmap for digital & innovative tools

Objective

To develop a regional training roadmap for the systematic adoption and integration of innovative digital tools, including EO, AI, numerical modelling, and early warning systems, into marine pollution preparedness and response training curricula, supported by clear protocols for interoperability and data exchange across the BSB.

Description

This action will develop a structured, region-wide training roadmap defining a clear pathway for the progressive integration of innovative digital tools into national and regional marine pollution preparedness and response training curricula. Priority tools include EO and Copernicus Marine Environment Monitoring Service (CMEMS) data for real-time pollution tracking; AI-assisted tools for incident prediction and decision support; numerical modelling systems for pollution dispersion forecasting; and integrated early warning platforms for timely alert and notification.

A core principle of the roadmap is its adaptability to the diverse profiles of BSB countries. Recognising that the level of familiarity with and adoption of digital tools varies significantly across the region, depending on each country's organisational capacity, available equipment, and specialised personnel, the roadmap will be tailored to the specific needs, capacities, and stakeholder profiles of each participating country. Training pathways will be differentiated accordingly, ensuring that all riparian states can engage meaningfully and progress at an appropriate pace, while collectively working toward a common baseline of digital competency in marine pollution response.

The roadmap will also establish clear protocols for interoperability and data exchange, ensuring that digital tools used by different national authorities are compatible and that information can be shared rapidly and reliably across borders during transboundary pollution incidents. These protocols will be embedded into training content, equipping responders with the knowledge to operate effectively within regional data-sharing frameworks.

The roadmap will be developed through a participatory process engaging national authorities, research institutions, technology providers, and operational responders, and will be maintained as a living document subject to regular review and update as technologies and regional needs evolve.

Time required to implement	Priority
Mid-term to Long-term	Medium to High

Feasibility

Green to Yellow

Anticipated outputs	Proposed indicators of success
Regional training roadmap for digital and innovative tools Integration of EO, AI, modelling, and early warning systems into training curricula Differentiated training pathways based on national capacities Guidance materials and technical standards for digital tool adoption	Number of training programmes integrating digital tools Adoption of the roadmap by BSB countries Increased use of EO, AI, and modelling in preparedness and response Level of participation across countries with varying capacities Regular updates of the roadmap reflecting technological advances Improved response effectiveness through digital tool application

Involved stakeholders	
National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response Black Sea Commission (BSC)	Research institutions & Universities Training centers European Maritime Safety Agency (EMSA) European Environment Agency (EEA) Copernicus Marine Environment Monitoring Service (CMEMS)

4.2 Regional Training Repository & knowledge bank

Objective

To establish a Regional Training Repository serving as a shared knowledge bank, providing all BSB countries with open access to a common baseline of standards, guidelines, training materials, and innovative practices in marine pollution preparedness and response, while allowing for adaptation to national and institutional needs.

Description

This action aims to establish a centralised, open-access Regional Training Repository functioning as the primary knowledge bank for marine pollution preparedness and response training across the BSB. The Repository will consolidate and make available a comprehensive collection of training materials, curricula, standards, guidelines, and innovative practices, drawing on contributions from all riparian states as well as international partners and organisations, and will be maintained as a living resource, regularly updated to reflect evolving knowledge, technologies, and regional needs.

A core feature of the Repository should be its flexibility. While providing a common baseline accessible to all BSB countries, materials will be structured to allow adaptation to the specific national and institutional contexts, capacities, and stakeholder profiles of each country. This dual function, harmonisation and adaptability, ensures that the Repository supports both regional convergence and locally relevant implementation.

The Repository will also serve as the primary platform for an online training programme, offering a diverse range of learning formats, including presentations, video tutorials, webinars, and interactive modules, to complement in-person training and expand the reach of capacity building across the region regardless of geographic or resource constraints. A blended learning model combining remote and in-person components will be promoted as the recommended approach, addressing both theoretical knowledge and practical skills. The establishment of an accreditation system, through which participating universities or recognised teaching entities issue certifications of attendance and completion, will further enhance the programme's credibility and institutional recognition.

A dedicated Train-the-Trainer (ToT) programme will be developed and hosted through the Repository, equipping national facilitators with the skills needed to cascade training independently and sustainably across institutions. Core training subjects covered will include marine pollution incident response and management, wildlife assessment and assistance, data collection, impact documentation, and post-incident evaluation.

The Repository will be developed and governed through a participatory process involving all BSB countries, ensuring shared ownership and long-term commitment to its maintenance and expansion beyond the project lifecycle.

Time required to implement	Priority
Mid-term	Medium to High

Feasibility

Green to Yellow

Anticipated outputs	Proposed indicators of success
Operational Regional Training Repository (open-access knowledge bank)	Number of training materials and modules available in the Repository
Consolidated training materials, standards, and guidelines	Number of registered users across BSB countries
Online training programme (webinars, videos, interactive modules)	Participation in online and blended training programmes
Blended learning framework (online + in-person)	Number of certified trainers and issued accreditations
Train-the-Trainer (ToT) programme and certified trainers	Frequency of content updates and new contributions
Accreditation system for training completion	Level of usage and integration into national training systems
Regularly updated “living” knowledge platform	

Involved stakeholders

- National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response
- Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response
- Black Sea Commission (BSC)
- Research institutions & Universities
- Training centers
- European Maritime Safety Agency (EMSA)
- European Environment Agency (EEA)
- NGOs

4.3 Regional e-Platform & Smartphone Application for incident reporting, surveillance & decision support

Objective

To develop a regional digital platform and companion smartphone application that enhances the rapid identification, reporting, and coordinated response to marine pollution incidents, supporting both specialised authorities and the general public within a unified regional framework.

Description

This action addresses the need for a modern, accessible, and operationally effective digital tool for the real-time reporting, surveillance, and management of marine pollution incidents across the BSB. Together with the Regional Training Repository (Action 4.2), this platform is envisioned as a component of the regional Hub for Marine Pollution Preparedness and Response outlined in Action 3.1.

The platform will function as a unified incident reporting and decision support system, enabling both specialised personnel and the general public to report marine pollution incidents directly. Submitted reports will be routed through a tiered evaluation and verification process, with different levels of assessment applied depending on the source and nature of the report. Based on verified incidents, the platform will automatically generate alerts, advisory messages, and response guidelines, differentiated according to the user's credentials, role, and level of expertise. For example, operational responders may receive detailed technical protocols, while members of the public may receive accessible guidance on how to assist, such as instructions for supporting wildlife in distress, or safety warnings advising them to keep clear.

The platform will be directly linked to the Regional Network of Specialists (Action 3.1), enabling rapid mobilisation of the appropriate expertise in response to verified incidents and minimising response times, particularly in time-critical situations such as wildlife emergencies or fast-spreading pollution events.

The integration of AI capabilities will be actively explored to enhance the platform's analytical power, including automated incident detection and classification, pattern recognition across reporting data, pollution trajectory prediction, and intelligent prioritisation of alerts and response actions. Combined with EO data and real-time environmental monitoring feeds (if in place), this has the potential to create a highly effective regional surveillance and decision support tool.

The platform will be designed as a smartphone application as well as a web-based interface, ensuring it is simple, intuitive, and immediately accessible at all times and from any location. User experience and accessibility will be central design principles, ensuring the tool is practical for both field responders and the wider public across all riparian states and in multiple languages.

Finally, a governance framework will be developed to define the roles, responsibilities, and institutional arrangements for the platform's operation, management, and long-term maintenance. Priority will be

given to assigning governance responsibilities to organisations directly involved in marine pollution incident management and response, ensuring operational relevance and institutional commitment to the platform's sustainability.

Time required to implement	Priority
Mid-term to Long-term	Medium to High

Feasibility

Yellow

Anticipated outputs	Proposed indicators of success
Operational regional E-platform and smartphone application Integration with Regional Network of Specialists (Action 3.1) Governance framework for platform management and maintenance	Platform and app successfully deployed and operational across BSB Number of registered users (authorities + public) Number and quality of incident reports submitted and verified

Involved stakeholders

- National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response
- Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response
- Research institutions & Universities
- Black Sea Commission (BSC)
- Training centers
- European Maritime Safety Agency (EMSA)
- European Environment Agency (EEA)
- NGOs & wildlife response organisations
- Technology providers (AI, EO, software developers)
- General public (as users/reporters)

Category 5: Raising awareness

5.1 Increase public awareness & community engagement

Objective

To develop an integrated strategy to educate and inform citizens about marine pollution and the value of proactive preparedness and prompt response to incidents.

Description

This action aims to develop a comprehensive strategy and a coordinated series of measures to produce varied, targeted, and accurate public awareness resources for the general public across all BS countries. These resources will cover the different types of marine pollution in the BS, the nature and impacts of marine pollution incidents, including those arising from armed conflicts, and the concrete ways in which citizens and different stakeholders can contribute to both preparedness and response operations, as well as to the mitigation of environmental effects. A coherent cross-border message on marine environmental protection will underpin all materials, developed and promoted in coordination with regional stakeholders such as the BSC to ensure consistency and regional ownership of the communication effort.

The action targets a broad range of stakeholder categories in each BS country, including national environmental, transport, and maritime authorities, coast guard services, port authorities, local governments, regional and EU organisations (e.g., the BSC, EMSA, EEA), mariners and their trade associations, fishers and their trade associations, NGOs and civil society organisations, research institutes and universities, schools and educational institutions, coastal communities, and media organisations. With particular emphasis on coastal communities and maritime stakeholders, the action aims to foster a shared "culture of prevention" and rapid response to marine pollution emergencies across the region. Outreach will draw on a diverse mix of communication channels and formats, for example, mass media (newspapers, radio, and television), the internet and social media, public lectures and symposia, workshops, field exercises and simulations, and education programmes for teachers and students of all ages. Dissemination of information in both written and spoken form is envisaged, and the development of dedicated smartphone applications, or the adaptation of existing ones, should also be explored.

Time required to implement	Priority
Short-term to mid-term	Medium to High

Feasibility

Green to Yellow

Anticipated outputs	Proposed indicators of success
Regional public awareness strategy and communication plan Multilingual awareness materials (digital and print) Coordinated cross-border campaigns Educational programmes and training resources for schools	Number of campaigns and materials produced/disseminated Level of public engagement (event participation, online reach, app downloads) Active participation of stakeholders in preparedness/response initiatives

Involved stakeholders	
National authorities (environment, transport, coast guard, civil protection, port authorities), particularly decision-makers involved in marine pollution response	Associations of coastal & marine economic sectors
Administrations/Agencies responsible for the state of the marine environment & training for marine pollution response	Environmental NGOs working on BS issues
Local authorities - coastal municipalities, other smaller local authorities	Black Sea Commission (BSC)
	European Environment Agency (EEA)
	Common Maritime Agenda (CMA) for the BS
	EU regional projects

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CONCLUSIONS

The BSB faces a marine pollution challenge of exceptional complexity, transboundary in reach, compounding in character, and accelerating in several of its most severe dimensions. The threat assessment, the analysis of training needs, and the priority actions set out in this RAP together make the case that the gap between this challenge and the regional capacity to address it is real, significant, and in some areas, particularly conflict-related pollution, critically urgent. They also make the case that closing this gap is achievable, provided that the right institutional foundations are put in place and that the commitment to regional cooperation is sustained beyond the lifecycle of individual projects.

The priority actions set out in this RAP are structured accordingly, each with a defined purpose, identified stakeholders, and measurable targets, and are intended, in combination, to support a gradual transition from the current fragmented, project-dependent training landscape toward a more coherent and durable regional framework. The five categories of action, institutionalisation and governance, capacity building, operational preparedness, digitalisation, and public awareness, are mutually reinforcing. Progress in one area strengthens the others, and the cumulative effect of sustained implementation across all five is substantially greater than the sum of the individual parts.

Several points of emphasis deserve to be carried forward from this RAP into its implementation.

The institutional question is foundational. Every other action depends, in some measure, on the existence of a permanent regional coordination mechanism with a clear mandate and stable resources. Without it, even the best-designed training programmes, digital tools, and exercise frameworks will remain vulnerable to the discontinuities of project funding cycles. Establishing that mechanism, in whatever

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form best suits the governance realities of the BS region, is the first and most consequential step toward a durable regional preparedness framework.

The conflict dimension demands sustained attention. The environmental consequences of the war in Ukraine have already exceeded anything that existing regional frameworks were designed to address, and their full extent will continue to unfold for years. Building the training capacity to respond to conflict-generated pollution, and embedding that capacity in institutional structures that can maintain it, is both an immediate operational necessity and a long-term commitment that this RAP explicitly requires.

Marine pollution threats do not remain static, and neither can the frameworks designed to address them. The pollution landscape of the BS will continue to evolve, driven by geopolitical events, technological change, scientific discovery, and the deepening effects of climate change, and the capacity to update training content and operational protocols in response is as important as their initial design. This is why regular curriculum review, after-action learning, and continuous engagement with the evolving state of knowledge are built into the priority actions as standing commitments rather than periodic additions, and why the mechanisms for continuous improvement proposed across the RAP should be treated as integral to its implementation rather than secondary to it.

Finally, the regional dimension of this challenge is not merely geographic. It reflects a shared vulnerability and a shared interest. Marine pollution does not respect national boundaries, and neither can the response to it. The BS coastal states have a common stake in the health of the sea they share, and this RAP is, at its core, an invitation to act on that shared interest in a coordinated, sustained, and ambitious way. The framework it proposes is a beginning. Its value will be determined by the commitment, institutional, financial, and political, that the riparian states and their partners bring to its implementation.

Appendix

Details on the RESPONSE regional consultation workshop

A World Café workshop was organised as part of the RESPONSE regional consultation workshop to gather participants' views and provide input to the RAP for Capacity Building in Marine Pollution Emergency Preparedness and Response. The workshop was followed by an interactive discussion on the conditions, challenges, and actions necessary to achieve the objectives of the RESPONSE project.

The World Café workshop - The method

The World Café method is a participatory approach designed to facilitate meaningful conversations among groups of people around questions that matter to them. Rather than relying on a traditional interview, presentation, or focus group format, the method creates a relaxed, café-like environment in which participants engage in several rounds of small-group dialogue. Participants usually sit at small tables, discuss a question or theme, record key ideas on paper, and then move between tables so that ideas, perspectives, and insights can circulate across the wider group. This process is often described as a form of cross-pollination, as participants carry ideas from one conversation into the next, gradually building a shared understanding of the topic.

The scope of the World Café method is broad. It can be used in research, education, community engagement, organizational development, service improvement, and stakeholder consultation. In research contexts, it can generate qualitative data about participants' experiences, views, priorities, and concerns. In practice-based or organizational settings, it can support co-production, collective reflection, learning, and the development of shared priorities for action. The method is particularly useful when the aim is to explore a topic from multiple perspectives, involve a relatively large number of participants, encourage dialogue across different stakeholder groups, and identify common themes, concerns, or possibilities for change.

A key advantage of the World Café method is that it supports inclusive and democratic participation. By using small-group conversations, it can make it easier for participants to contribute than in a large plenary discussion, while the movement between tables helps ensure that ideas do not remain confined to one group. The informal café-style setting is intended to create a safe and welcoming atmosphere, which can support openness, creativity, active listening, and reflection. The method is also efficient when researchers or facilitators want to engage many participants within a limited period of time, as it can gather a wide range of perspectives more quickly than individual interviews. In addition, because participants record ideas during the discussions, the method can reduce the need for transcription while still producing useful material for thematic analysis, service development, or action planning.

Thus, the World Café method is valuable when the purpose is not simply to collect individual opinions but to create a collaborative space where participants can think together, listen to diverse perspectives, and generate collective insights. Its strength lies in combining structure with openness: the facilitator provides the purpose, questions, and process, while participants shape the content of the conversation through their own experiences and priorities. For this reason, the method is especially appropriate for complex, relational, or practice-based topics where understanding is likely to emerge through dialogue rather than through one-way data collection.

The RESPONSE World Café workshop

The RESPONSE World Café was held in order to hold a structured discussion at the RESPONSE regional consultation workshop, aiming to provide critical input to the RAP for Capacity Building on Marine Pollution Emergency Preparedness and Response.

The participants were divided into 3 groups to hold the discussions at 3 tables with rotations. Each table had a host.

The following were discussed: The RAP has five thematic categories: 1) institutionalisation, policy, and regulation; 2) training process and capacity building; 3) operational preparedness and exercises; 4) digitalisation and knowledge management; 5) raising awareness. Each thematic category has Priority Actions.

The World Café discussed the Activities under each Priority Action. The groups of participants rotate from one table to another while the hosts stay at the tables, with each group having reviewed all Activities at the end.

Work on the assessment

The host provides a brief introduction to the thematic categories and activities in the set. The participants read, comment, and assess:

A: Timeframe of the activities – short-term, medium-term, long-term
Choose and mark the timing of interventions (short-term = 1-5 years, mid-term = >5-10 years, and long-term = >10 years.
B: Level of priority for implementation of activities – the perceived relative importance of individual activities – low, medium, or high
C: Feasibility of the activities – e. g., how practical, realistic, and achievable each of them is (to be marked with stickers in colour code – green, yellow, red).

Notes, comments, new ideas, and activities are recorded by the host. The host summarized the assessment and comments, ranking, and ideas, and provides a review to the whole workshop. Topics for further general discussion emerged from the assessment.

The general discussion after the group work at the 3 tables can focus on the conditions necessary for the implementation of activities, the obstacles/barriers preventing their implementation, and actions to be taken in order to achieve the RAP objectives and other policy/strategic objectives. Problems, obstacles, and barriers/risks are also expected to emerge from the comments. Those will be helpful for the policy paper expected from us later in the project period.

Recommendations based on conclusions and suggestions of participants in the World Café

Thematic Category 1: Institutionalization, policy, and regulation
Priority Action 1.1 Support institutional developments for sustainable and long-term joint response training activities

Timeframe of activities Medium to Long;

Priority: High (almost unanimously)

Feasibility: Red – difficult to implement prevailing; Yellow – quite difficult, found in occasional comments.

General comments: The activities under Priority Action 1.1 are very important but very difficult to implement. The decision makers on national and regional level must be closely involved in the process.

The term “coordinating body or mechanism” was discussed and the prevailing opinion was that “a

coordinating body" is perceived as a stable institutional arrangement and therefore preferable to the term "coordinating mechanism".

The BSC is not functioning actively, according to some participants, and a couple of suggestions are related to its functioning.

Recommendations: 1. Specify the form of the entity described as "coordinating body or mechanism at the regional level" to better support the institutional development of the training and capacity building activities on regional level. The participants in the discussion preferred the term "coordinating body" as it implies a permanent body with institutional backing and regular support for the capacity building process.
2. Encourage active involvement of the BSC in the establishment and support to the regional joint response training activities
3. Promote the idea of including a formal interinstitutional agreement /Memorandum of Understanding as Annex to the Black Sea Convention (Bucharest Convention).
4. Encourage the identification of sustainable funding sources and pathways for support of the design and institutionalization of the process.

Thematic Category 1: Institutionalization, policy, and regulation
Priority Action 1.2 Build a coherent institutional architecture for training coordination

Timeframe of activities: Medium, almost unanimously; Short for mapping the roles of actors.

Priority: High, almost unanimously

Feasibility: Red and Yellow – very difficult or quite difficult to implement;

General comments: The participants share the opinion that building a coherent regional institutional architecture for training coordination is a high priority but remains a challenge and is likely to take some time.

There are some comments reminding that the establishment of regional entity, models for governance, formal agreement, roadmap for long term involvement are complex international processes and require both time and strengthening of the institutional capacity of the Black Sea countries.

The participants believe that the development of a roadmap for the regional entity and its components – the Regional Hub for Marine Pollution Preparedness and Response, the Regional Training Repository and the Regional e-Platform - would take some time to establish and would be facing both institutional and financial challenges.

Recommendations: 1. Put pressure on the regional actors and national governments to put preparedness and emergency response to marine pollution on their priority lists for the Black Sea.
2. Support and encourage the identification of good practices in training coordination and multi-level governance on preparedness and emergency response in the Black Sea region.
3. Encourage awareness raising and understanding on all levels of the serious problems with preparedness and emergency response to marine pollution in the Black Sea countries.
4. Promote the use of open science on all levels to not only make scientific research, data, and dissemination accessible to all levels of society, especially to responsible maritime administrations and emergency response teams in the Black Sea countries, but also incorporate its key pillars into the RAP Hub, Repository and E-Platform and encourage public use and support.

Thematic Category 1: Institutionalization, policy, and regulation
Priority Action 1.3 Strengthening regional regulatory frameworks

Timeframe of activities Medium, except one activity; Short for the production of the toolkit for regulatory authorities a mapping the roles of actors.

Priority: High, unanimously

Feasibility: Yellow and Green – from quite difficult to realistic – those assessments predominate, when referring to the design of modules, the holding capacity-building workshops and peer-to-peer exchange and the production of reference toolkit for regulatory authorities.

Red – very difficult – is the assessment for incorporating the designed modules into the national training frameworks of the Black Sea countries.

General comments: The participants share the view that the design of the training modules, the holding of capacity-building workshops and peer-to-peer exchanges and the production of the reference toolkit for regulatory authorities are activities they are familiar with and can implement. They however raised the issue who/what institution would organize and finance them. Incorporating the designed modules into the national training frameworks of the Black Sea countries is expected to create problems.

The physical location for the Regional Training Repository, probably a server with support and management staff, was also discussed. There have been recommendations to have it located in an EU member country.

Funding sources and pathways have been pointed out again as important issues for the RAP process design and implementation.

Recommendations: 1. Engage the regional Black Sea governments in a coordinated campaign for the ratification of the 2010 HNS (Hazardous and Noxious Substances) Protocol expected to enter into force as early as late 2027. Ratification from the riparian states is needed to support effectively the process of addressing HNS pollution sources.

Thematic Category 2: Training process & capacity building
Priority Action 2.1 Increase & strengthen capacity at the BSB level

Timeframe of activities: Medium to Long

Priority: High to Medium

Feasibility: Yellow and Green (from quite difficult to realistic) predominate, when referring to the design of modules, the holding capacity-building workshops and peer-to-peer exchange and the production of reference toolkit for regulatory authorities. Red (very difficult) is the assessment for incorporating the designed modules into the national training frameworks of the Black Sea countries.

General comments: The participants have supported the idea of designing and implementing an effective and comprehensive training framework on regional scale. Some details from the logical steps leading to the accomplishment of the priority action. The integration of the harmonized baseline competences and training standards into the training has been regarded as a very difficult process.
There has been some enthusiasm about the tools for regional knowledge-sharing and sub-regional training hubs. The RESPONSE project Digital Toolkit has been regarded as a model for future knowledge-sharing tools and hubs.
The integration of the newly developed training frameworks into systematized legislative, regulatory and management actions was estimated to be very difficult. The measure has been identified as one of vital importance for the success of all institutional arrangements of the RAP and its implementation.

Recommendations: 1. Engage the national governments of the Black Sea littoral countries and the relevant regional bodies, where appropriate, in the integration of the newly developed training frameworks into systematized legislative, regulatory and management actions to generate effective capacity building.

Thematic Category 2: Training process & capacity building
Priority Action 2.2 Strategic networks & international knowledge exchange

Timeframe of activities: Medium to Long

Priority: High to Medium

Feasibility: Yellow to red (from quite difficult to difficult)

General comments: Stakeholders acknowledged this as a challenging, large-scale undertaking. A key point raised was the importance of actively involving and consulting government bodies alongside a range of organisations — including NGOs — though achieving this, particularly at a regional level, presents considerable coordination challenges. The need for consistent and sustainable funding was also highlighted as a critical concern.

It was noted that good practices and supporting structures already exist within the BSB that could serve as a foundation for implementing the proposed actions. However, for these to contribute meaningfully to long-term outcomes, they must be clearly documented, consistently applied, and developed with sustainability in mind.

Recommendations: Build on and leverage the structures and initiatives already established within the BSB, while strengthening stakeholder engagement and fostering a culture of voluntarism to support broader and more sustained participation.

Thematic Category 3: Operational preparedness & exercises
Priority Action 3.1 Regional network of specialists & exercise calendar

Timeframe of activities: Medium to Long

Priority: High to Medium

Feasibility: Yellow to red (from quite difficult to difficult)

General comments: Stakeholders emphasized that the systematic organisation of exercises is essential for achieving and continuously improving response capabilities. It was noted that coverage should extend beyond conventional pollution scenarios to include persistent and emerging threats — particularly those arising from military conflicts and new categories of pollutants, which present increasingly complex challenges.

Securing stable and consistent funding was identified as a significant concern. Equally critical is the need to clearly define the roles and responsibilities of all parties involved in the coordination, organisation, and implementation of exercises, as well as ensuring adherence to the agreed exercise programme. This is further complicated by the fact that these are inherently political decisions, requiring the engagement and commitment of central governments across the BS countries.

Recommendations: Build upon solutions and structures that have already demonstrated their effectiveness. Clearly define the roles and responsibilities of each entity involved in the exercise programme. Prioritise the securing of dedicated funding and ensure consistency in the planning and implementation of exercises over time.

Thematic Category 3: Operational preparedness & exercises
Priority Action 3.2 Institutionalizing a regional training & exercise framework

Timeframe of activities: Medium to Long

Priority: High to Medium

Feasibility: Green to Yellow (from realistic to quite difficult)

General comments: Stakeholders underlined the importance of institutionalising the regional training and exercise framework as a means of ensuring its long-term sustainability. A key priority is keeping exercises

current and adaptive — regularly updated to reflect emerging challenges in marine pollution response, as well as incorporating new solutions, innovative tools, and evolving methodologies.

The involvement of government bodies and relevant entities was considered essential, though achieving this in practice remains a notable challenge. Clear definition of roles and responsibilities — particularly with regard to the development, maintenance, and updating of training content — was identified as a prerequisite for effective and accountable governance of the framework. Efforts should also be made to formalise relationships between participating entities, whether through official agreements or informal arrangements, with the aim of building a committed and engaged regional network. Securing adequate and reliable funding was highlighted as a fundamental enabler across all of the above.

Recommendations: Engage relevant entities in a manner that actively supports the long-term sustainability of the regional training and exercise framework. Securing consistent funding is essential, as is the clear definition of roles and responsibilities among all parties involved in the framework's governance and implementation.

Thematic Category 3: Operational preparedness & exercises
Priority Action 3.3 Harmonization and expansion of national contingency plans

Timeframe of activities: Medium to Long

Priority: High to Medium

Feasibility: Green to Yellow (from realistic to quite difficult)

General comments: Stakeholders stressed the importance of building upon existing approaches and structures that have already proven effective. A key priority is the expansion of national contingency plans to encompass emerging types of marine pollution and address new and complex challenges — most notably, marine pollution incidents arising from armed conflicts.

Given the political nature of contingency planning at the national level, government involvement was considered indispensable. The harmonisation of national contingency plans through standardised protocols, templates, and common methodologies was identified as a significant step forward, not only in strengthening national preparedness but also in facilitating the development of a cohesive regional contingency plan. It was further emphasised that these plans must be reviewed, assessed, and updated on a regular basis to remain relevant and effective in the face of evolving threats.

Recommendations Leverage existing structures and successfully applied practices as the foundation for further development. Build incrementally upon what works, ensuring that national contingency plans are progressively expanded, harmonised, and kept up to date to meet both current and emerging challenges.

Thematic Category 4: Digitalization & knowledge management
Priority Action 4.1 Regional training roadmap for digital & innovative tools

The main activities that may be implemented in the short time period include: 1) development of a structured, region-wide training roadmap defining a clear pathway for the progressive integration of innovative digital tools into national and regional marine pollution preparedness and response training programmes, and 2) integration of advanced tools such as Earth Observation (EO) and Copernicus Marine Environment Monitoring Service (CMEMS) data for real-time pollution tracking, supported by AI-assisted tools for incident prediction, decision support, numerical modelling and early warning systems. These measures were classified by stakeholders as having high priority and high implementation feasibility (green colour).

The medium-term actions include: 3) establishing differentiated training pathways based on national capacities across the Black Sea countries. This measure was generally characterized by medium priority

and medium implementation preparedness (yellow colour), reflecting the need to account for varying national capacities and institutional conditions.

The long-term aspects include: 4) establishing clear protocols for interoperability and data exchange, ensuring that digital tools used by different national authorities are compatible and that information can be exchanged effectively across borders during transboundary pollution incidents. This measure was recognized by participants as having high priority but medium implementation readiness (green–yellow colours) due to the institutional and technical coordination required.

The key suggestions reflected by the participants emphasize the importance of ensuring compatibility with already existing tools and systems and avoiding duplication of mechanisms already in place. The participants have confirmed the very high level of topicality of common roadmap and other cooperative digital solutions for networking. Participants also highlighted that implementation of approaches should remain flexible and account for differences in institutional capacities among Black Sea countries, while strengthening long-term regional coordination and information exchange mechanisms.

Thematic Category 4: Digitalization & knowledge management
Priority Action 4.2 Regional Training Repository & knowledge bank

The main activities that may be implemented in the short time period include: 1) Establish a centralized, open-access Regional Training Repository functioning as the primary knowledge bank for marine pollution preparedness and response training across the BSB - to serve as the primary platform for an online training programme, offering a diverse range of learning formats, 2) Consolidate and make available in the Repository a comprehensive collection of training materials, curricula, standards, guidelines, and innovative practices, drawing on contributions from all riparian states as well as international partners and organisations, and maintained as a living resource, regularly updated to reflect evolving knowledge, technologies, and regional needs, and 3) Ensure flexibility for the Repository by providing a common baseline accessible to all BSB countries, while materials are structured to allow adaptation to the specific national and institutional contexts, capacities, and stakeholder profiles of each country. These activities were consistently identified by stakeholders as measures with high priority and high implementation feasibility (green colour), reflecting strong support for rapidly establishing a shared regional knowledge infrastructure.

The medium-term actions include: 4) Ensure that the Repository will serve as the primary platform for an online training programme, offering a diverse range of learning formats including presentations, video tutorials, webinars, and interactive modules, to complement in-person training and expand the reach of capacity building across the region regardless of geographic or resource constraints, and 5) Ensure that the Repository will use a blended learning model combining remote and in-person components to be promoted as the recommended approach, addressing both theoretical knowledge and practical skills. These measures were generally characterized by medium to high priority and medium implementation readiness (yellow–green colours), mainly due to technical requirements and the need for harmonised implementation mechanisms.

The long-term aspects include: 6) Ensure the establishment of an accreditation system, through which participating universities or recognised teaching entities issue certifications of attendance and completion, strengthening the programme's credibility and institutional recognition, 7) Develop a dedicated Train-the-Trainer (ToT) programme to be hosted through the Repository, equipping national facilitators with the skills needed to cascade training independently and sustainably across institutions. Core training subjects cover oil include marine pollution incident response and management, wildlife assessment and assistance, data collection, impact documentation, and post-incident evaluation, and 8) Develop and govern the Repository through a participatory process involving all BSB countries, ensuring shared ownership and

long-term commitment to its maintenance and expansion beyond the project lifecycle. These activities were recognized as having high strategic importance, but stakeholders generally assessed them as medium implementation feasibility (yellow colour) because of the institutional arrangements, governance mechanisms and long-term commitments required.

The key suggestions reflected by the participants emphasized the need to ensure sustainability of the Repository beyond the project lifecycle, strengthen institutional ownership and accreditation mechanisms, and maintain the platform as a continuously updated and participatory regional knowledge-sharing system. The participants also proposed to use not only the Repository as a tool for consolidated representation and access to the study materials, knowledges and case-studies but also use popular study platforms (such as Google-classes, Moodle etc.).

Thematic Category 4: Digitalization & knowledge management
Priority Action 4.3 Regional e-Platform & Smartphone Application for Incident reporting, surveillance & decision support

Participants agreed that, technically speaking, the regional E-platform can operate within a short timeframe, but its full operational capability necessitates additional activities requiring time. The main activities that may be implemented in the medium time period include: 1) Design and establish operational regional E-platform as a tool for the real-time reporting, surveillance, and management of marine pollution incidents - designed as a smartphone application as well as a web-based interface, 2) Integrate the E-platform with the Regional Training Repository (Action 4.2) to become a component of the regional Hub for Marine Pollution Preparedness and Response outlined in Action 3.1, and 3) Link the E-platform (& App) directly to the Regional Network of Specialists (Action 3.1), enabling rapid mobilization of the appropriate expertise in response to verified incidents and minimizing response times. These measures were mostly assessed by stakeholders as medium-term interventions, with medium to high priority and generally high or moderate feasibility for implementation (green to yellow colours). The long-term actions include: 4) Enhance the analytical capabilities of the E-platform (& App) through the integration of cutting-edge AI technologies and real-time environmental monitoring feeds, improving automated incident detection, intelligent alert prioritisation, and response coordination, and strengthening the platform as an effective regional surveillance and decision-support tool, and 5) Develop a governance framework to define the roles, responsibilities, and institutional arrangements for the E-platform's operation, management, and long-term maintenance with focus on assigning governance responsibilities to organizations directly involved in marine pollution incident management and response. These measures were generally recognized as medium to high priority, but their implementation readiness was assessed more cautiously, mainly as yellow, with some green assessments, due to technical complexity, institutional coordination and long-term governance requirements.

The key suggestions reflected by the participants emphasize that similar applications and platforms already exist or are being developed under different projects, so the E-platform should avoid duplication and ensure interoperability with existing tools. Participants also stressed the need for a clear governance model, long-term maintenance arrangements and practical integration with the Regional Training Repository and the Regional Network of Specialists.

Thematic Category 5: Raising awareness
Priority Action 5.1 Increase public awareness & community engagement

The medium-term actions include: 1) Develop an integrated regional public awareness strategy and communication plan to educate and inform citizens about marine pollution and the value of proactive preparedness and prompt response to incidents, 2) Design a coordinated series of measures to produce varied, targeted, and accurate public awareness multilingual resources/materials for the public across all

BSB countries, and 3) Develop coherent cross-border communication messages on marine pollution preparedness and prompt response to underpin all materials, developed and promoted in coordination with regional stakeholders such as the BSC, to ensure consistency and regional ownership of the communication effort. These measures were generally assessed by stakeholders as having high priority and medium implementation feasibility (yellow–green colours), reflecting broad agreement regarding their importance while recognizing the need for coordination among countries and institutions.

The long-term actions include: 4) Foster a shared "culture of prevention" and rapid response to marine pollution emergencies across the region through coordinated cross-border campaigns and targeted influence on the public, 5) Ensure outreach based on a diverse mix of communication channels and formats (e.g. mass media, internet and social media, public lectures and symposiums, workshops, field exercises and simulations, and education programmes for teachers and students of all ages), and 6) Ensure wide dissemination of information in both written and spoken form and through the development of dedicated smartphone applications, or the adaptation of existing ones. These activities were generally recognized as medium to high priority, while implementation feasibility was assessed predominantly as yellow, reflecting the long-term behavioural, organisational and communication efforts required for sustainable implementation.

The key suggestions reflected by the participants emphasized the importance of ensuring long-term and continuous communication rather than one-time campaigns. Participants also stressed the need to adapt communication approaches to different target audiences and highlighted that development of a regional culture of prevention should be regarded as a long-term process requiring continuous engagement and coordinated regional action.

This summarizing represents general vision expressed by the Participants. There have been studies of assessments that are either extremely high or abnormally low, but they were omitted only in case when there was no appropriate explanation for the difference in opinions among the participants' community.

Interactive discussion with stakeholders

The stakeholders were engaged in an interactive discussion about the conditions and actions necessary to achieve the RESPONSE project objectives applying the related EU policy documents - the CMA for the BS and the MSFD both calling for the sustainable use and recovery of marine resources towards achieving a Good Environmental Status (GES) for the BS - as the means to support healthy and resilient seas and foster integrated marine governance.

The path to achieve those objectives relies on our capacity to support advanced training schemes on marine pollution preparedness and response and on our ability to measure, map and monitor the status, the functioning and the threats to the marine ecosystems at relevant temporal and spatial scales.
The questions for consultation focused on the following topics: the challenges and barriers to develop and apply advanced training schemes; and the steps needed to successfully support advanced innovative training schemes on marine pollution preparedness and response and ensure their uptake.

The discussions were held in two group sessions, each followed by wrap-up summary delivered by the two moderators. The main outcomes of the discussions are presented below:

Challenges and Barriers

1. Which are the main challenges to apply advanced tailored training schemes and update them on a regular basis over a long period? (difficulties, circumstances, attitudes)

The participants in the discussion identified some challenges that may hinder the application of the advanced tailored training schemes and their update over a long period of time. Those include insufficient

expert and human capacity, deficiencies in the institutional structures and training arrangements that hinder the advanced training process, deficiencies in equipment (including software) for monitoring and training, financial constraints for preparedness, emergency response and advanced training activities.

In addition, there are deficiencies in the application of environmental democracy in the Black Sea region especially in trans-border perspective. Legislative volatility in some of the countries and swift government changes pose some challenges as well.

2.What are the main barriers (e.g. legal, political, administrative, financial, or any other) that currently prevent the application of advanced tailored training schemes across borders in the Black Sea basin countries?

Several main barriers currently prevent the application of advanced tailored training schemes across borders in the Black Sea basin countries.

The main barrier is the ongoing war conflict (described previously as a challenge) and the martial law restrictions on activities and data exchange and the suspension of proper functioning of the BSC, because of the political tensions and hostilities. Constraints on the regional dialogue and communication between countries, the limitations to commercial shipping, the economic and political sanctions create barriers before the application of advanced regional training schemes.

Conflicting economic, social and environmental interests also pose barriers, the participants noted.

Additionally, the lack of dialogue between some of the countries affects negatively the public interest in the environmental issues of the Black Sea and reduces the public support to environmental measures, preparedness and response to marine pollution on regional scale.

Roadmap /Steps to success

3. Which stakeholders (e.g. administrations, authorities, local governments, operators and companies, scientists, academia, NGOs, etc.) should play a stronger role in marine environmental pollution response at National and Regional scale? And how?

The participants in the group were unanimous that high level policy makers and relevant administrations should play a stronger role in the sense that they should put marine pollution preparedness and emergency response for the Black Sea on the priority list of national governments and regional bodies.

4. How can cooperation among Black Sea countries be strengthened to propose and apply operating models for key authorities/organizations in charge of marine pollution across national borders?

The transboundary nature of marine pollution was recognized as the most important factor providing strong motives to the regional governments to cooperate and coordinate the operating modes of their key authorities and organisations/institutions in charge of marine pollution monitoring and response. Some measures proposed comprise joint monitoring initiatives, regular data exchange, and continuous communication between national authorities.

The group commented on cooperation between institutions for exchange of good practices depending on the scope of the pollution event. For minor events local administrations, port authorities and private companies are usually involved. For major pollution events national operation command centers and naval forces are involved, and sometimes entities like EMSA provide support. Patterns of partnerships and cooperation in the use of resources can be used as models of good practices, the group noted.

The group also stressed on the need to end hostilities and address political conflicts to achieve effective cooperation. Joint exercises are believed to be a successful form of cooperation development and can be included in the training curricula.

5. How should the advanced training curricula be adapted to address new/emerging pollution challenges and issues in the BS Region (e.g. pollution from persistent chemicals, pollution from armed conflicts, coastal events, maritime traffic, offshore infrastructure, or floods)?

Including emerging pollution types such as war time pollution in the regular monitoring activities e. g. those under MSFD with some adaptations of the 11 existing Descriptors, was considered of great importance by the group. Hotspots identification and monitoring and potential risks associated with them were also noted for including in the advanced training curricula. Several other types of pollution were highlighted for inclusion in the advanced training curricula and regular monitoring programmes regionally: hydrocarbon pollution from various sources and monitoring, persistent chemicals pollution and monitoring, especially in seafood etc..

Community awareness was identified as an important element of the new curricula to be adapted to address new/emerging pollution challenges and issues in the Black Sea Region. The importance of advanced training on open EO and satellite monitoring for volunteers was emphasized to service the monitoring of incidents and war time pollution, especially useful in port areas in Ukraine.

6. How can the advanced and new training schemes and curricula be incorporated in national/institutional training programmes on preparedness and emergency response? (e.g. monitoring, planning, patrols, technology use, community involvement)? And regional programmes?

The working group recommended that national universities should be engaged in both the design and incorporation of the new training schemes in the national/institutional training programmes on preparedness and emergency response to marine pollution. The mechanism for allocating additional funding for the new training programmes, additional payment for staff and training facilities/exercises should be provided by the responsible ministries, the participants noted. Volunteer and/or paid support to the training by experts, businesses, NGOs could be envisaged as well as distant learning programmes available for a small fee or partly paid to lecturers/experts.

7. How can the new and advanced training schemes become self-sustained (if you think it is possible) to ensure a continuous interactive process of evaluation and fine-tuning well beyond the project timeline? (improved enforcement and compliance)

The participants strongly supported the idea that the basic task for the establishment of the new and advanced training schemes lies with the national governments, maritime administrations and civil defence authorities mainly. The need for establishing stronger coordination between the existing authorities was noted. The participants pointed to many difficulties (institutional and financial) for the training schemes to become self-sustained currently, and to ensure continuity. Some participants were definite that the national governments had all the responsibility and the power to allocate resources for the training schemes.

8. What is your definition of “success” for the new and advanced training schemes in the Black Sea context (introduction of incentives for further participation and uptake, regional training programmes established, local communities involved in campaigns, citizen science monitoring etc.)? Which indicators could be used to monitored this success?

The new advanced training schemes according to the participants could be used in two ways: as advanced information tools and as emergency decision support tools. The awareness of all societal stakeholders (close to 100%) of the availability of such resources and the options for their use was considered to be a success.

The ability of stakeholders to use easily the advanced schemes and tools was also considered a success, with measurable parameters to be designed.

Key stakeholders' involvement in the BS countries was considered a success (and indicator) for the advanced training schemes.

Some participants defined "success" as a fully functional system of decision support and emergency response fit-for-purpose and freely available for use to all societal stakeholders. Transparency of information about accidents, emergencies and damages provided by the authorities was described as an important element.

Though "success" may differ from country to country, the new advanced schemes and tools should help citizens receive timely information, warning and assistance/rescue from the responsible authorities. Citizens should be provided with a user-friendly system suggesting how to react under certain emergency circumstances, what authority to address, what steps to take, how to face or evade risks. In addition, the system, according to participants, should be able to provide answers in a timely manner, as quickly as possible, to give the users time for reaction when they receive the answers they seek.

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