



Catalogue of Services

D3.1: Interactive catalogue of
services, technical expertise,
know-how and technical support
in the area.



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Author(s)	Mariana Corá
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Internal reviewers	Luz Paramio, Francesca Battaglia, Tommaso Tesi, Tania Montoto, Valerie de Liedekerke, Andre Valente.

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Table of Contents

Document Information.....	2
Document history and changes	2
List of Figures.....	5
List of Tables.....	5
List of Acronyms	5
1. Summary	6
2. The BlueMissionAA Catalogue	7
2.1 Services and Solutions	8
2.2 Target audience	8
2.3 Scope	10
3. Methodology.....	11
3.1 Sources.....	11
3.2 Project Selection	12
3.2.1 Project Screening.....	12
3.3 Services and Solution classification	13
3.3.1 Identification	14
3.3.2 Type of services and solutions	14
3.3.3 Scope of services and solutions	16
3.3.4 Ecosystems and habitats	17
3.3.5 Substantial benefits.....	18
3.3.6 Mission Ocean.....	19
3.3.7 Business model and maturity level.....	20
3.3.8 Survey, interview, and validation.....	23
4. Services and Solutions	24
5. References.....	26
6. Appendix 1 – Project Inventory	27

List of Figures

Figure 1: Objectives of the BlueMissionAA Catalogue of Services.	7
Figure 2: Group of stakeholders identified as target audience.	9
Figure 3: BlueMissionAA Catalogue of Services overall methodology.	11
Figure 4: Selection of sources during the construction of the BlueMissionAA Catalogue.	11
Figure 5: Filters applied for the first phase of project selection.	12
Figure 6: Classes of services and solutions.	15
Figure 7: Benefits.	19
Figure 8: Maturity level scale for solution's classification.	22

List of Tables

Table 1. Definition of Services and Solutions.	8
Table 2. List of possible actors that can benefit from the Catalogue of Services.	9
Table 3. Information collected during project screening.	13
Table 4. General information required for the identification.	14
Table 5. Categories for classifying according to the type of service or solution.	15
Table 6. Different categories to define the service and solution's scope.	17
Table 7. MAES typology for marine ecosystems based on Maes, et al. (2020).	18
Table 8. Categories of EU Mission Ocean alignment.	20
Table 9. Example of projects with potential services and solutions.	27

List of Acronyms

Acronyms	Meaning
MAES	Mapping Europe's Ecosystems
CSA	Coordination and Support Action
EUNIS	European Nature Information System
WP	Work package

1. Summary

A multitude of factors, including overfishing, pollution, and climate change, play a role in the degradation of marine ecosystems, leading to a decline in marine biodiversity and overall ocean resilience. To ensure sustainable use, it is essential to implement restoration initiatives and maintain rehabilitated areas within and beyond protected regions (European Environment Agency, 2019).

The Atlantic and Arctic Basins' marine ecosystems face significant ecological challenges resulting in habitat fragmentation, degradation and destruction and biodiversity loss. For instance, in terms of climate change, the Arctic Basin is at the forefront and is affected by the impact of global warming, causing ice melting and disrupting ocean circulation (European Environment Agency, 2016). Hence, restoring the marine and coastal environment in the Atlantic and Arctic Basins is crucial for protecting the biodiversity and livelihoods of the communities that depend on them.

To respond to these challenges, the EU Mission Restore our Ocean and Waters by 2030 targets the restoration of the marine ecosystem restoration in the Atlantic and Arctic basins, focusing on enhancing climate resilience and adapting coastal and marine environments (European Commission, 2021). The implementation of the EU Mission in these basins is facilitated by the BlueMissionAA Coordination and Supporting Action (CSA).

In line with the goal of facilitating the successful implementation of the EU Mission in the Atlantic and Arctic basins, the BlueMissionAA project is dedicated to creating a comprehensive catalogue of pre-existing solutions and initiatives for restoring marine and coastal ecosystems. The catalogue intends to expedite the replication and upscaling of established restoration solutions, ultimately fostering a thriving, innovative ecosystem on a basin scale and extending its influence beyond those boundaries. This report provides a detailed overview of the BlueMissionAA Catalogue of Services, shedding light on its structure, objectives, and functionalities.

2. The BlueMissionAA Catalogue

To demonstrate and facilitate the expansion of impactful restoration solutions, BlueMissionAA is creating a catalogue of existing scientific and actionable knowledge and innovative solutions, making them accessible for replication and scaling up. This catalogue will serve as a valuable resource for new and ongoing initiatives, readily available to stakeholders within the Atlantic and Arctic regions and beyond. This accessibility encourages innovators to share their research, technology and innovation with industry, policymakers, and the wider public, making expertise easily accessible for conservation and restoration projects.

The BlueMissionAA Catalogue of Services emerges as a dynamic and innovative tool for fostering collaboration, facilitating knowledge-sharing, and initiating transformative actions within ocean restoration, conservation, and the blue economy.

The present report delves into the architecture and purpose of the Catalogue, outlining its fundamental principles and multifaceted functions. It aims to provide a comprehensive understanding of how the BlueMissionAA Catalogue of Services can drive positive change by connecting the different stakeholders, presenting a wide array of solutions and services, and enabling the replication and scaling up of impactful ideas. It's important to note that this report primarily aims to introduce the methodology and analysis necessary for building the BlueMissionAA Catalogue. Consequently, the list of services and solutions presented here is not exhaustive and will continue evolving as the BlueMissionAA project is implemented.

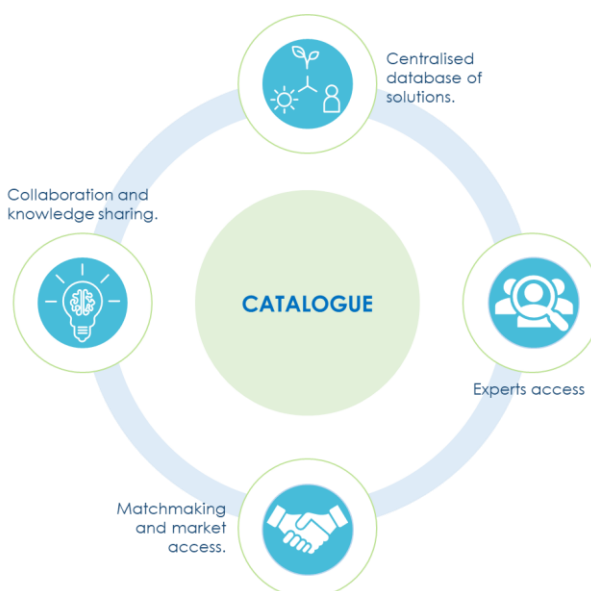


Figure 1: Objectives of the BlueMissionAA Catalogue of Services.

The BlueMissionAA Catalogue of Services is a centralised platform offering services, solutions, and products dedicated to restoration, biodiversity protection and transforming the Blue Economy within the Atlantic and Arctic basins. Its main goal is facilitating access to innovative solutions, fostering knowledge sharing, replicating, and scaling up ideas and solutions. Serving as a convenient one-stop resource, it empowers end-users to access relevant services and information tailored to their specific needs (Figure 1). With a comprehensive range of restoration and protection services, the catalogue ensures precise and accurate information on all available offerings.

Designed with a user-centric approach, the BlueMissionAA Catalogue of Services provides a web-based interface to accommodate a wide range of user needs. To enhance service clarity, it incorporates detailed categorisation, encompassing solution descriptions, types, impact on restoration, target users, service maturity, and other pertinent information.


As an innovative tool, the BlueMissionAA Catalogue of Services encourages collaboration between market actors and innovators, stimulating growth and value addition in the Blue Economy through a mutually beneficial approach. By facilitating cooperation and knowledge sharing across the Atlantic and Arctic regions, the catalogue empowers actors to share their innovative solutions and assists market players in accessing the expertise required to develop impactful projects.

Lastly, the BlueMissionAA Catalogue of Services serves as a platform for information exchange with an international audience of practitioners, policymakers, stakeholders, and scientists involved in conserving and restoring the Atlantic and Arctic Oceans. Consequently, it enables direct matchmaking between innovators offering restoration solutions and service providers supporting the deployment, scaling up, and replication of these solutions. Ultimately, the catalogue promotes the sustainable use of marine resources and facilitates the growth and development of a Sustainable Blue Economy.

2.1 Services and Solutions

The BlueMissionAA Catalogue of Services is a compilation of solutions and services that promote the conservation and restoration of the Atlantic and Arctic basins. These solutions and services are defined in the catalogue as **units of replication** (Table 1), and they differ in their nature. Services involve one party offering a particular set of actions, tasks, skills, or assistance to another party. At the same time, solutions encompass a broad range of innovative ideas, strategies, products, or methods designed to effectively address specific problems, regardless of whether they are provided a service.

Table 1. Definition of Services and Solutions.

UNITS OF REPLICATION	
	<ul style="list-style-type: none"> ● Services involve one party offering a particular set of actions, tasks, skills, or assistance to another party.
	<ul style="list-style-type: none"> ● Solutions are innovative ideas, strategies, products, or methods designed to effectively address specific problems.

► **The solutions and services within this catalogue are intended for diverse users, all with the same goal of advancing the conservation, protection, and restoration of marine and coastal ecosystems and biodiversity.**

2.2 Target audience

The BlueMissionAA divides the catalogue's target audience into two different groups: the end-users and the providers. The definition of end-user can be simplified as the person seeking the information on the catalogue. In contrast, providers are the parties responsible for the services and solutions presented in the catalogue. In common with both groups, the target audience

covers innovators, specialists, service providers, funders/investors, decision-makers, individuals, and other kinds of public. This decision is rooted in recognising that these groups of actors can derive the greatest benefit from the catalogue, whether in obtaining information or sharing their solutions. The target audience can be represented by their group of stakeholders, as is shown in Figure 2 and Table 2.

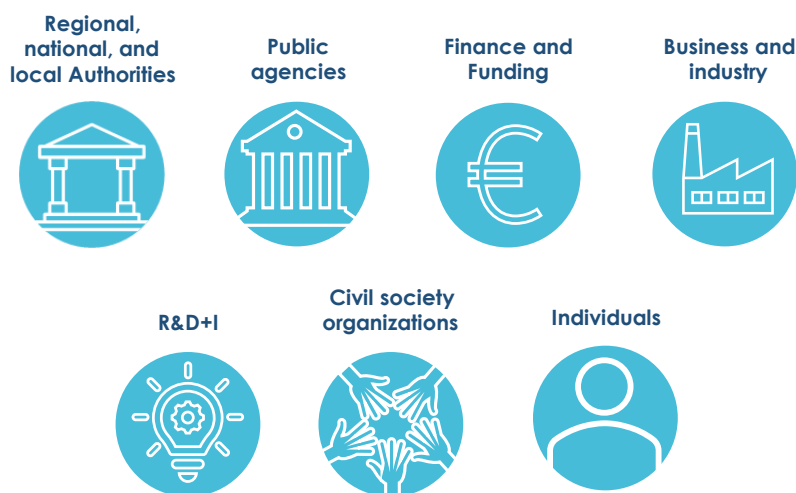









Figure 2: Group of stakeholders identified as target audience.

Table 2. List of possible actors that can benefit from the Catalogue of Services.

GROUP OF ACTORS	EXAMPLES
 Regional, national, and local authorities	Policies makers and/or implementers
 Governmental and public agencies	Local, regional, national, and international agencies
 Finance and funding	Banks, insurance, foundations, venture capitalists, and philanthropic organisations
 Business and industry	Large, medium, and small enterprises, startups, accelerators
 R&D and Innovation institutions	Universities, innovation centres, clusters, others
 Civil society organisations	Non-profit organisation, NGOs, cooperatives, networks
 Individuals	Private persons

2.3 Scope

The BlueMissionAA Catalogue of Services focuses on services and solutions derived from science-based and nature-inspired approaches designed to assist businesses, policymakers, and scientists in addressing the challenges and opportunities associated with marine and coastal restoration and advancing a sustainable blue economy within the Atlantic and Arctic basins.

The development of the BlueMissionAA Catalogue of Services occurs in phases. Initially, the focus centres on analysing EU-funded projects present in the Portfolio Analysis EU Mission "Restore our Ocean and Waters by 2030" and in the Baseline studies (Chimini , Failler, Galgani, & et. al., 2023; Alao Chanou, McColgan, Berbel, & et. al., 2023). Subsequently, the scope will be extended to projects from other funding sources and businesses, as well as the upcoming web-based platform *WaveLinks*¹ that compiles projects from several sources, and is being developed in the framework of BlueMissionAA, PREP4BLUE² and BlueMissionBanos³. Finally, a third phase envisions allowing individual providers and innovators to upload their solutions directly onto the platform.

¹ *WaveLinks* is a collaborative web platform with user-friendly web interfaces developed for unifying space for ocean-related projects to share and access data, fostering a dynamic ecosystem of information exchange and collaboration. The beta version of the *WaveLinks* is scheduled for release in November 2023 during the 1st *BlueMissionBanos Mission Arena* in Gothenburg.

² <https://prep4blue.eu/>

³ <https://bluemissionbanos.eu/>

3. Methodology

The development process of the BlueMissionAA Catalogue of Services can be summarised as depicted in Figure 3. The process commenced with a phase dedicated to defining the methodology for selection and classification while identifying pertinent sources. In the subsequent stage, the analysis is concentrated on the project level, with an emphasis on selecting projects that have the potential to provide innovative solutions. Following this, the focus is placed on the solution level to gain an in-depth understanding of the solutions, culminating in a thorough classification validated by the project coordination and the responsible project manager. The ultimate phase involves uploading the solution directly onto the BlueMissionAA Catalogues of Services and making it publicly available.

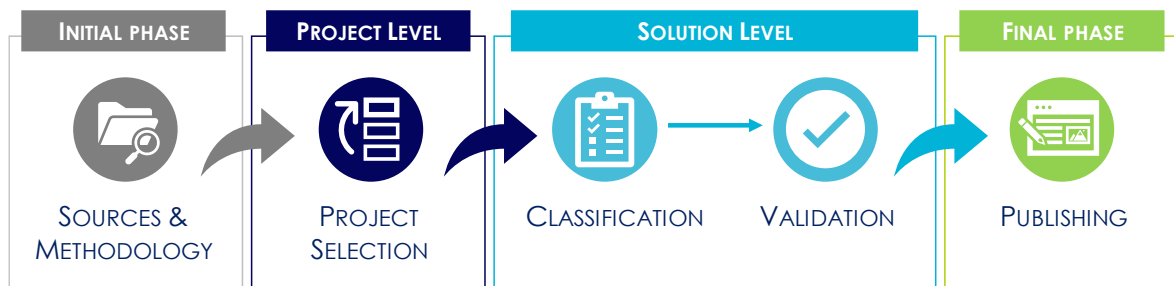


Figure 3: BlueMissionAA Catalogue of Services overall methodology.

3.1 Sources

The initial phase of catalogue development involved creating a list of sources of projects with pertinent outcomes that could be translated into services and solutions. To accomplish this, the efforts were divided into four distinct sources and timeframes, as outlined in Figure 4.

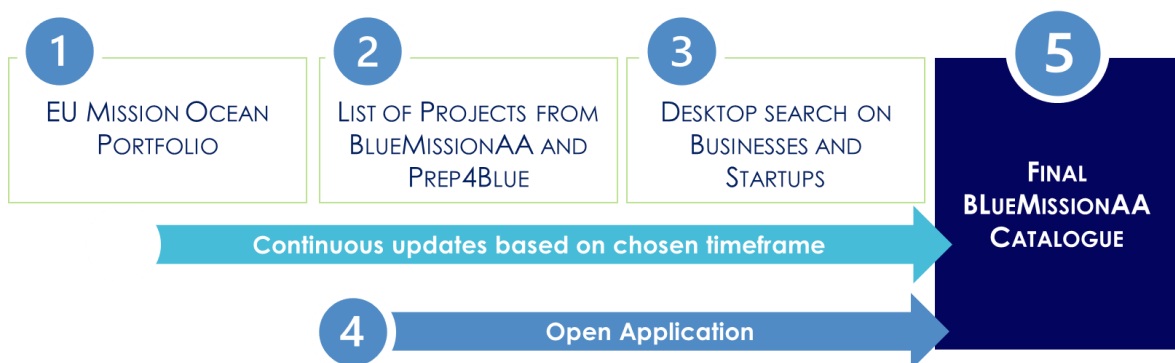


Figure 4: Selection of sources during the construction of the BlueMissionAA Catalogue.

The starting point is the Baseline studies (Alao Chanou, McColgan, Berbel, & et. al., 2023) and the Portfolio Analysis EU Mission "Restore our Ocean and Waters by 2030" (Chimini, Failler, Galgani, & et. al., 2023). Subsequently, the scope of investigation expanded to encompass lists generated within the BlueMissionAA project (D2.1 Inventory of ecosystem restoration

activities, actors and KPIs from recent and ongoing projects) and the Prep4Blue database. Simultaneously, an effort will be put in place to identify, classify, and evaluate market-based solutions and services. These business-based solutions and services will be compiled through desk research and discussions with enterprising at events within the target basins, such as startup pitch events. Projects promoting innovation, including the BlueInvest, national clusters, and incubators, were also leveraged as reference points.

3.2 Project Selection

As mentioned previously, the first phase of project selection relied on the 841 projects listed in the Portfolio Analysis of the EU Mission "Restore our Ocean and Waters by 2030" (Chimini , Failler, Galgani, & et. al., 2023) and on the list presented by the Baseline studies (Alao Chanou, McColgan, Berbel, & et. al., 2023). The initial stage of the selection process involved applying three filters according to the following criteria: the geographic region of focus, alignment with EU Mission Objectives and Enablers, and the execution timeframe (Figure 5).

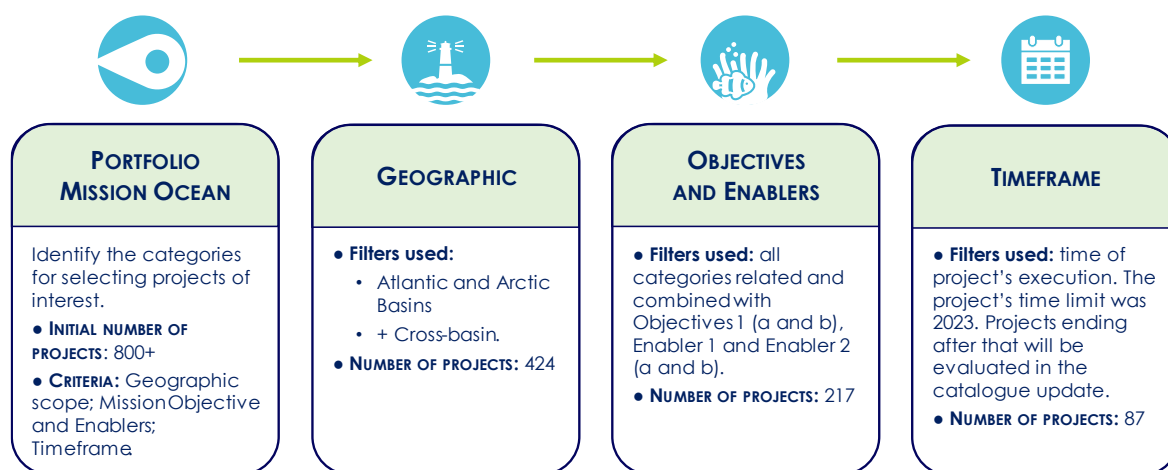


Figure 5: Filters applied for the first phase of project selection.

3.2.1 Project Screening

From the remaining 87 projects filtered from the Portfolio Analysis of the EU Mission, "Restore our Ocean and Waters by 2030" (Chimini , Failler, Galgani, & et. al., 2023) and the projects presented in the Baseline studies (Alao Chanou, McColgan, Berbel, & et. al., 2023) an additional screening was performed to select suitable candidates. Some information was collected during the analysis to help the project selection process (Table 3).

A list of projects with potential for innovative services and solutions to be added into the BlueMissionAA Catalogue of Services is provided in Appendix 1 – Project Inventory.

Table 3. Information collected during project screening.

Criteria	Brief description
Status of the project	<ul style="list-style-type: none"> • <i>Concluded</i> • <i>Close to the end</i> • <i>Ongoing</i>
Objectives of the project	Description
Geographic scope	Where the pilots and actions are located
Target audiences	Who will benefit from the project results?
Mission Objectives	<p>Does the project meet the EU Mission Objectives (Yes or No)? If YES, which ones?</p> <p><i>i) Protect and restore marine and freshwater ecosystems and biodiversity.</i></p> <p><i>ii) Prevent and eliminate pollution of our ocean, seas, and waters.</i></p> <p><i>iii) Make the sustainable blue economy carbon-neutral and circular.</i></p>
Mission Targets	<p>Does the project meet the EU Mission Targets (Yes or No)? If YES, which ones?</p> <p><i>1. Protect a minimum of 30 % of the EU's Sea area and integrate ecological blue corridors as part of a true Trans-European Nature Network.</i></p> <p><i>2. Strictly protect at least 10 % of the EU's Sea area.</i></p> <p><i>3. Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystems.</i></p>
Project results	List the overall results of the project.
Potential source of Services and Solutions for the Catalogue	Does the project have potential tangible solutions? Can it be translated into solutions? (brief description and evaluation).

3.3 Services and Solution classification

This section is dedicated to identifying, describing, classifying, and qualifying relevant services and solutions. Certain information is derived from the project analysis. At the same time, additional insights are gained through an in-depth examination of each project result and, finally, through discussions with project coordinators and managers. The overarching goal is to identify and transform the key project outcomes into tangible services and solutions.

The initial phase of classification involves identifying each service and solution. Subsequently, these services and solutions are categorised into different groups, including types, scope, habitats, alignment with the EU Mission Ocean, maturity, and other specified categories (detailed below). It's important to emphasise that each service and solution published in the Catalogue must provide consistent and detailed information so that end-users can effectively access the information they need. This consistency is essential for a seamless user experience and understanding of the offerings.

3.3.1 Identification

The identification section in the BlueMissionAA Catalogue of Services contains essential information to ensure clarity about each service or solution and the responsible parties associated with them. This information enables users to quickly understand the nature of each offering and provides contact details for the responsible providers or entities.

Table 4. General information required for the identification.

Level	Information	Description
Service and solution	Title	<i>The name or title of the service or solution.</i>
	Description	<i>A brief and concise overview of what the service or solution entails.</i>
	Type of unit of replication?	<i><input type="checkbox"/>Service <input type="checkbox"/>Solution</i>
	Unique identifier	<i>A code or reference number for each service or solution to facilitate tracking and referencing (SE000 – for services, SO000 – for solutions).</i>
	Keywords and tags	<i>Relevant keywords or tags that describe the service or solution, aiding in search and categorisation.</i>
Provider	Provider	<i>The entity, organisation, or individual responsible for developing and/or offering the service or solution.</i>
	Contact information	<i>Contact details for the provider, including email, phone number, and any relevant website links.</i>
	Type of provider	<i>Follows the stakeholder categories detailed in 2.2 Target audience</i>

3.3.2 Type of services and solutions

Each service and solution can be divided into at least four main classes (Figure 6), which can further be subdivided into seven categories based on the types of services and solutions they represent.

The types of services and solutions can be organised into seven categories (Table 5). This organisation provides a structured and systematic approach to classifying and understanding the various offerings within the catalogue. Furthermore, this categorisation helps users quickly identify and locate the desired service or solution, simplifying the search and selection process. It also aids in clear communication and presentation, making it more accessible for stakeholders to navigate the catalogue and find the services or solutions that best match their needs. Overall, categorising them into seven distinct groups simplifies the catalogue's structure and enhances its usability.

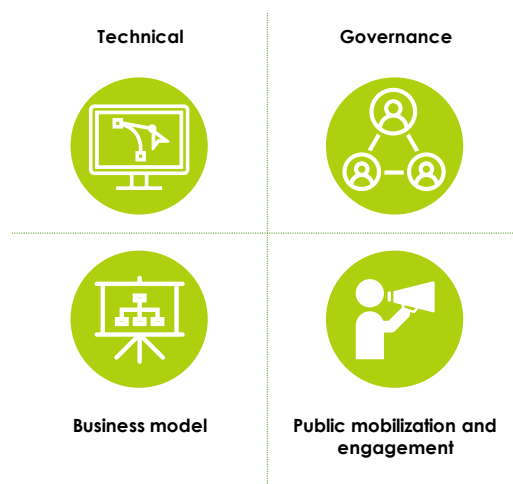






Figure 6: Classes of services and solutions.

Table 5. Categories for classifying according to the type of service or solution.

Type	Examples
Knowledge sharing 	<ul style="list-style-type: none"> Guidelines, Methodology, and Similar Databases Reports and Plans Communication Toolkits Scientific Articles Advice and Consultancy
Technology and tools 	<ul style="list-style-type: none"> Software Apps Models Platforms
Infrastructure 	<ul style="list-style-type: none"> Exchangeable Infrastructure Ship and Other Movable Platforms Movable Lab/Container Laboratory Capacity Testing Site Capacity Testing and Sampling Coastal Defence Infrastructure Environmental Recovery Infrastructure



Type	Examples
Material and equipment 	<ul style="list-style-type: none"> • <i>New material</i> • <i>Equipment</i>
Regulatory and Governance 	<ul style="list-style-type: none"> • <i>Legal framework</i> • <i>Governance models</i>
Financial and Business 	<ul style="list-style-type: none"> • <i>Finance solutions</i> • <i>Business models</i>

3.3.3 Scope of services and solutions

The scope of services and solutions is a critical factor in comprehending their replicability. Given the unique characteristics of each case, the analysis must be tailored to various contexts, whether or not they consist of pilot projects. Accordingly, scope categorisation may vary depending on the particular type of service or solution being analysed. The BlueMissionAA Catalogue of Services categorises the scope based on geographical and scale-related factors (Table 6). This approach allows for a more nuanced and context-specific understanding of replicability.

It's important to emphasise that while the BlueMissionAA primarily focuses on the Atlantic and Arctic basins, services and solutions developed for different geographical basins can also be of great interest and relevance. In such cases, the selection is based on the thematic alignment with the catalogue's goals rather than strict adherence to a specific geographic scope. This approach ensures that valuable and applicable services and solutions from various regions can be included and mapped within the catalogue, broadening its scope and impact.

Table 6. Different categories to define the service and solution's scope.

 Geographical (Sea basins)	 Scale
<ul style="list-style-type: none"> ● Atlantic & Arctic 	<ul style="list-style-type: none"> ● Local
<ul style="list-style-type: none"> ● Baltic and North Sea 	<ul style="list-style-type: none"> ● Regional
<ul style="list-style-type: none"> ● Danube 	<ul style="list-style-type: none"> ● National
<ul style="list-style-type: none"> ● Mediterranean 	<ul style="list-style-type: none"> ● Transboundary
<ul style="list-style-type: none"> ● Pacific 	<ul style="list-style-type: none"> ● EU
<ul style="list-style-type: none"> ● Indian 	<ul style="list-style-type: none"> ● International
<ul style="list-style-type: none"> ● Black Sea 	
<ul style="list-style-type: none"> ● Cross basin 	





3.3.4 Ecosystems and habitats

Protecting marine and coastal ecosystems and habitats is important for maintaining healthy oceans and restoring biodiversity. Different ecosystems and habitats support life and provide protection from predators and serve as food sources.

Classifying services and solutions by habitat improves the catalogue's ability to address a wide range of marine and coastal ecosystems. Another benefit is that services and solutions that address the restoration of a particular habitat can be better identified if this is included in the categorisation.

Given the ecological importance and relevance to the Blue Economy, the BlueMissionAA Catalogue has classified ecosystems using as a reference the Mapping Europe's Ecosystems (MAES) typology for marine ecosystems. This typology is divided into four types, presented, and detailed in Table 7 (Maes, et al., 2020).

Table 7. MAES typology for marine ecosystems based on Maes, et al. (2020).

MAES level 2 Ecosystem type	Definition
<p>Marine inlets and transitional water</p> 	<p>Ecosystems on the land–water interface under the influence of tides and with salinity higher than 0.5 ‰. Includes <i>coastal wetlands, lagoons, estuaries and other transitional waters, fjords and sea lochs and embayment.</i></p>
<p>Coastal</p> 	<p>Shallow coastal marine systems that experience significant land-based influences. Depth is between 50 and 70 m.</p>
<p>Shelf</p> 	<p>Marine systems away from coastal influence, down to the shelf break. They are usually about 200 m deep.</p>
<p>Open ocean</p> 	<p>Marine systems beyond the shelf break. Depth is beyond 200 m.</p>

Associated with the ecosystem, for classifying the service or solution based on the habitat they address, the BlueMissionAA Catalogue of Services uses the EUNIS methodology of defining habitat typology as a reference. Under level 1 of the EUNIS marine version 2022 classification, there are four groups of habitats relevant to the catalogue, each with a separate classification structure. They are **marine benthic habitats**, **pelagic water column**, **ice-associated marine habitats**, and **coastal habitats** (European Environment Agency, n.d.). The goal is to find solutions covering all these habitat groups. In some cases, that may include a further classification in more detailed levels of the EUNIS methodology.

3.3.5 Substantial benefits

We need healthy and productive ecosystems to benefit from the multiple environmental, economic, social and well-being benefits they provide. In a future climate change scenario, Atlantic and Arctic coastal and open ocean will experience rapid changes, ultimately affecting the ecosystem quality. Developing new strategies for ecosystem restoration offers the opportunity to effectively halt and reverse degradation, protect ecosystem services and

recover biodiversity, as well as increase climate resilience. For conservation and restoration projects, reducing stressors is a crucial priority to facilitate adaptation and support the health of ecosystems. Therefore, a set of benefits was selected to assess beneficial impacts on critical coastal and marine ecosystems and biodiversity stressors (Figure 7). This approach allows a better understanding of how each service and solution contributes to the ecosystem and biodiversity improvement. Equally important is to ensure effective indicators for measuring their contribution (Abelson, et al., 2020).

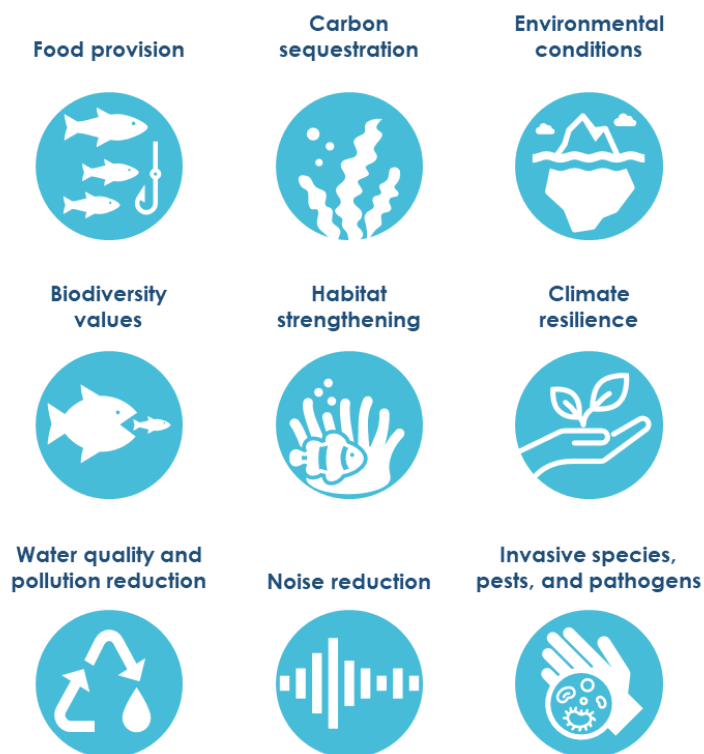


Figure 7: Benefits.

3.3.6 Mission Ocean

This category is responsible for assessing the degree of alignment of the service or solution with the EU Mission Ocean. The analysis determines whether the service or solution is linked to EU Mission Ocean's objectives, targets, enablers, and impacts. Table 8 displays the different categories of criteria used in this assessment. In bold, highlight the requirements designated for the Atlantic and Arctic basins.

Table 8. Categories of EU Mission Ocean alignment.

Criteria	Definition
Objectives (Obj)	<ul style="list-style-type: none"> ● Obj1) Protect and restore marine and freshwater ecosystems and biodiversity. ● Obj2) Prevent and eliminate pollution of our ocean, seas, and waters. ● Obj3) Make the sustainable blue economy carbon-neutral and circular.
Targets (T)	<ul style="list-style-type: none"> ● Obj1-T.a) Protect a minimum of 30 % of the EU's sea area and integrate ecological corridors as part of a true Trans-European Nature Network. ● Obj1-T.b) Strictly protect at least 10 % of the EU's sea area. ● Obj1-T.c) Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystems. ● Obj2-T.a) Reduce by at least 50% plastic litter at sea. ● Obj2-T.b) Reduce by at least 30% microplastic release into the environment. ● Obj2-T.c) Reduce by at least 50% nutrient losses, the use and risk of chemical pesticides. ● Obj3-T.a) Eliminate greenhouse gas emissions from maritime economic activities in the EU and sequester those emissions that cannot be avoided (net zero maritime emissions) ● Obj3-T.b) Develop zero-carbon and low-impact aquaculture and promote circular, low-carbon, multi-purpose use of marine and water space.
Enablers (En)	<ul style="list-style-type: none"> ● En1) Digital Ocean and water knowledge system. ● En2) Public mobilisation and engagement.
Impacts (Imp)	<ul style="list-style-type: none"> ● Imp1) Improvement and widening of the network of marine protected areas in the EU (30% of EU's seas protected with integrated ecological blue corridors and 10% of EU's seas areas strictly protected). ● Imp2) At least 25,000 km of restored free-flowing rivers. ● Imp3) Restored marine and coastal ecosystems in line with the upcoming EU Nature Restoration targets. ● Imp4) Reduction by 50% of the plastic at the sea and by 30% of micro-plastics released into the environment. ● Imp5) Reduction by 50% of nutrient losses and the risk and use of chemical pesticides and reduction of water pollution from pharmaceuticals. ● Imp6) Reduction of Blue Economy's greenhouse gas emissions by at least 50% and towards 55% compared to 1990 levels. ● Imp7) Circular low carbon use of marine space and sustainable aquaculture.

3.3.7 Business model and maturity level

Assessing how mature each service and solution are is a way to connect WP3's Innovation Support System with WP4's Transfer Support System. Together, the aim is to help move solutions toward the market. To do this, the BlueMissionAA uses maturity models, trusted tools for measuring how ready innovations are for real-world use. These models have been used for years in fields like information systems and organisational management, making them a solid way to evaluate and improve the readiness of our services and solutions for wider market use.

There are different aspects to be considered while measuring an innovation maturity. The Technology Readiness Level (TRL) scale is a systematic metric used to assess the maturity and readiness of a technology or innovation for practical application. It helps to gauge the progress of a technology throughout its development and to determine its readiness for deployment in real-world situations. TRL is commonly used in research, development, and innovation projects to communicate the technological readiness and potential for successful implementation. Each technology project is evaluated against the parameters of the Technology Level, and a TRL rating is assigned according to the project's progress.

The Business Readiness Level (BRL), on the other hand, is a metric for assessing the current status of a business project, rating it from the initial concept to full business readiness. The BRL provides an objective measure of progress, tracking the journey from basic research through development stages and culminating in market outreach.

The Regulatory Readiness (RRL) scale addresses the regulations that affect the commercialisation of new technologies. It is argued that even fully functional and market-ready technologies may fail without regulatory support. The factors underlying RRL are access to and understanding of the regulatory process, the effectiveness and safety of regulatory support, the principle of "do no significant harm", and the political and social acceptability of the project or solution (Dent & Pettit, 2011).

Lastly, the Societal Readiness Level (SRL) is a metric that assesses the societal and public readiness for adopting and implementing new technologies, innovations, or solutions (whether social or technical). It evaluates societal acceptance, understanding, and preparedness for introducing a specific technology or concept. SRL considers factors such as public awareness, regulatory and ethical considerations, and the overall societal impact of the technology. It helps stakeholders, including policymakers and innovators, understand the non-technical aspects and challenges associated with introducing innovations into society.

Under the BlueMissionAA Catalogue of Services, the maturity level assessment is done in a simplified manner to help WP4 connect with innovators with development solutions. This streamlined process aims to help these innovators access entrepreneurial opportunities for their solutions. Figure 8 brings the maturity level scale used by the catalogue for the solution's classification.

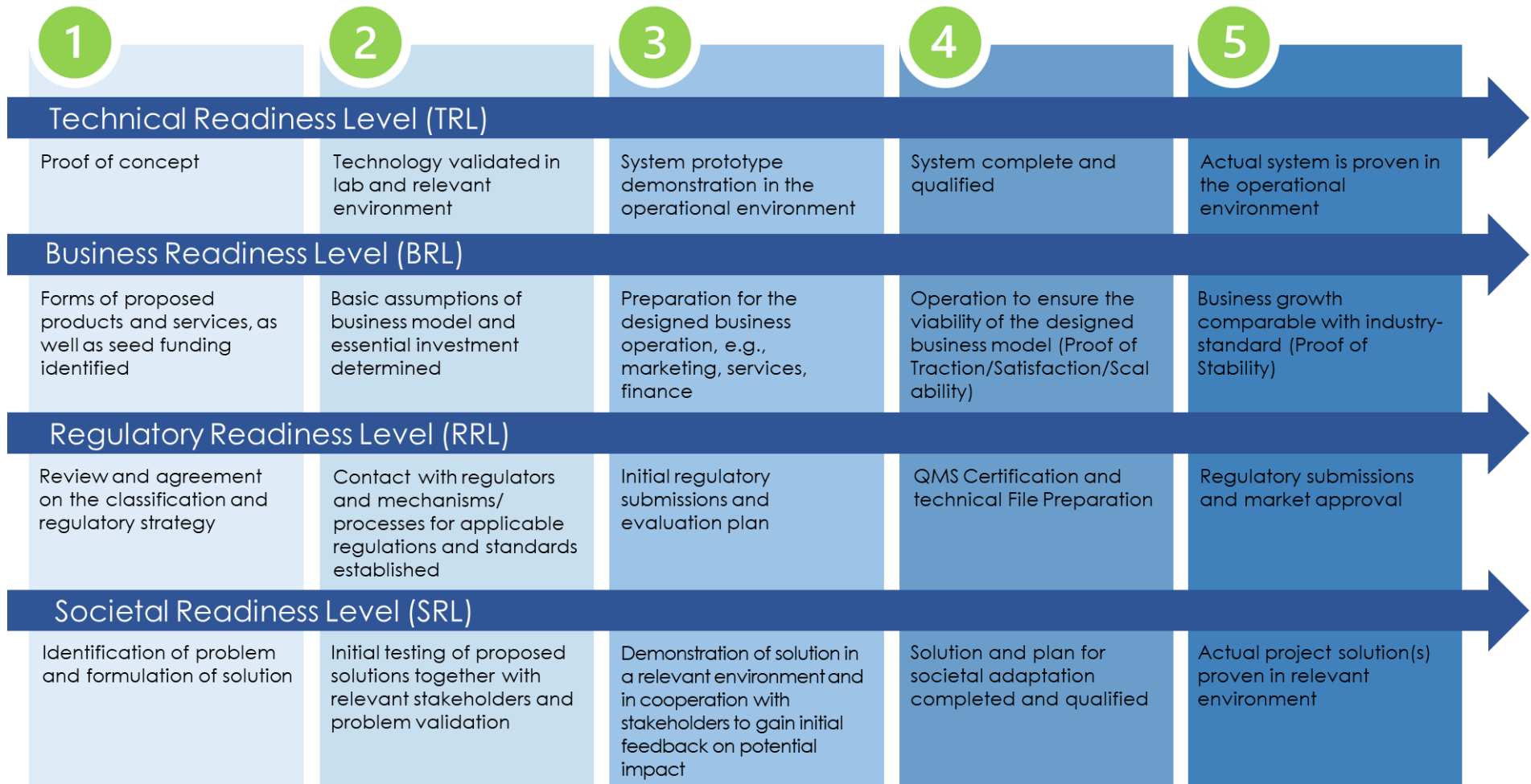


Figure 8: Maturity level scale for solution's classification.

3.3.8 Survey, interview, and validation

To best select services and solutions, this work includes content validation of a semi-structured interview with project managers or experts responsible for these services and solutions to gain a detailed understanding of the projects that best align with the requirements of the BlueMissionAA Catalogue. In addition, these contacts provide an opportunity to validate the services or solutions before they are uploaded into the catalogue. This thorough review and validation process ensures that offerings are consistent with the catalogue's objectives and are accurately presented to potential users.

Additionally, to find services and solutions that are not necessarily derived from EU projects, a survey in an open-form format will be sent to innovation clusters and centres to reach a different public.

4. Services and Solutions

This section is dedicated to demonstrating how each service and solution can be effectively presented to end-users when they consult the BlueMissionAA Catalogue of Services. While the layout may vary depending on the platform interface, the overarching goal is to present all gathered information in a clear, user-friendly, and accessible manner.

SO001 - THE EUROPEAN NATIVE OYSTER HABITAT RESTORATION HANDBOOK

General information

Unit of replication of Service | Solution

Description

The **European Native Oyster Habitat Restoration Handbook for the UK and Ireland** serves as the definitive guideline on restoring native oyster populations in these regions. This comprehensive guide offers step-by-step instructions, making it accessible to both small-scale feasibility projects and well-established initiatives. It grants readers access to valuable insights gathered by various networks. The handbook covers a range of topics, including an introduction to native oyster restoration, guidance on initiating a restoration project, practical methods employed in restoration efforts, recommended biosecurity measures, and effective strategies for communicating a restoration project.

Keywords and tags

Restoration, Oyster

Provider profile

Native Oyster Network

e-mail: NativeOyster@zsl.org

website: <https://nativeoysternetwork.org/>

Civil society
organizations



Service and solution details

Technical



Public mobilization and
engagement



Knowledge
sharing



Knowledge sharing as guidelines, methodology and similar

Scope



Atlantic and
Arctic basins



Local, regional and
national levels

Ecosystems and habitats

Marine inlets
and transitional
water



Substantial Benefits

Water quality and
pollution reduction



Habitat
strengthening



Food provision



Biodiversity
values



Environmental
conditions



EU Mission Ocean alignment



Objectives: (MO-OBJ-1) Protect and restore marine and freshwater ecosystems and biodiversity.

Targets: (MO-OBJ-1-T.c) Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystems.

Impact: (IMP-3) Restored marine and coastal ecosystems in line with the upcoming EU Nature Restoration targets.

Enabler: (En2) Public mobilisation and engagement.

Business development

Maturity level: Not applicable.

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6. Appendix 1 – Project Inventory

Table 9. Example of projects with potential services and solutions.

Criteria	Project analysis
ADAPTO - TOWARDS ADAPTIVE COASTAL MANAGEMENT	
Status of the project	<ul style="list-style-type: none"> • <i>Concluded</i>
Objectives of the project	<p>The Life-Climate project ADAPTO (Towards Adaptive Coastal Management) explored solutions to the impacts of climate change on the coast, like sea level rise and the increasing frequency of extreme weather events. On 10 pilot sites owned by the Conservatoire du littoral, ADAPTO experimented with adaptive coastal management. It helped demonstrate the ecological and economic benefit of improving the resilience of coastal areas to protect human activities by opening more space for the coastline.</p> <p>» The project's objectives are: (i) to make people understand the dynamic nature of the coastline and the need to adapt to it rather than resist it; (ii) to develop methodological tools to initiate, support and assess nature-based adaptation solutions for coastal areas; (iii) characterise the role of natural environments in organising an effective land-sea interface in terms of adaptation to climate change; (iv) to allow state of the art to progress through concrete actions on a wide range of geographical contexts representative of the diversity of ecosystems and coastal areas in Europe; (v) to develop knowledge about these solutions and their acknowledgement at a national and international level.</p>
Geographic scope	<ul style="list-style-type: none"> • Authie Bay (low, sandy Atlantic coasts) • Orne Estuary - Lancieux Bay - Moëze Marsh - Gironde Estuary - Leyre Delta (low, Atlantic polder coasts)
Target audiences	<ul style="list-style-type: none"> • Local authorities • Managers • Users of the territory (including schools and students)
Mission Objectives	<p><i>Does the project meet the EU Mission Objectives (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p><i>i) Protect and restore marine and freshwater ecosystems and biodiversity.</i></p>
Mission Targets	<p><i>Does the project meet the EU Mission Targets (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p><i>3. Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystems.</i></p>
Project results	<ul style="list-style-type: none"> • Implementing nature-based solutions through flexible coastline management: restoring mobility to increase resilience to climate and ocean change. • Examples: sediment management, dune reprofiling and sand recharging for the maintenance of an effective dune belt against flooding, as well as salt marshes' restoration to limit flooding events. • Presents renaturation and urban relocation as adaptation measures. • Supports the consideration of a "land property" protection status.

Criteria	Project analysis
Potential source of Services and Solutions for the Catalogue	Results and outcomes in the format of different types of methodologies and toolboxes. Interviews are needed to best decide which are the best candidates and how to translate the knowledge outcome into services and solutions.
MERCES (MARINE ECOSYSTEM RESTORATION IN CHANGING EUROPEAN SEAS)	
Status of the project	<ul style="list-style-type: none"> • <i>Concluded</i>
Objectives of the project	The MERCES project is focused on the restoration of different degraded marine habitats, with the aim of 1) assessing the potential of different technologies and approaches, 2) quantifying the returns in terms of ecosystem services and their socio-economic impacts; 3) defining the legal policy and governance frameworks needed to optimise the effectiveness of the different restoration approaches. Specific aims include a) improving existing and developing new restoration actions of degraded marine habitats; b) increasing the adaptation of EU degraded marine habitats to global change; c) enhancing marine ecosystem resilience and services; d) conducting cost-benefit analyses for marine restoration measures; e) creating new industrial targets and opportunities.
Geographic scope	Atlantic basin (Spain, Portugal, France, Ireland, UK)
Target audiences	A diverse range of stakeholders.
Mission Objectives	<p><i>Does the project meet the EU Mission Objectives (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p><i>i) Protect and restore marine and freshwater ecosystems and biodiversity.</i></p>
Mission Targets	<p><i>Does the project meet the EU Mission Targets (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p><i>3. Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystems.</i></p>
Project results	Example: Azores case study of the MERCES project developed methodologies and tools for restoring degraded deep-sea coral gardens. The main pilot action consisted of testing cold-water coral transplantation techniques as an active restoration tool, also called assisted regeneration, to aid the recovery of coral gardens potentially impacted by human activities (e.g., deep-sea fishing, seafloor mining).
Potential source of Services and Solutions for the Catalogue	Results and outcomes in the format of tools, guidelines, database, methodologies, toolkits, and knowledge sharing. Interviews are needed to best decide which are the best candidates and how to translate the knowledge outcome into services and solutions. Furthermore, the project has a commercial partner to test innovations.

Criteria	Project analysis
MARINE DEBRIS ACTION PLANNER (MDAP)	
Status of the project	<ul style="list-style-type: none"> • <i>Concluded</i>
Objectives of the project	<p>The Marine Debris Action Planner (MDAP) is a project for developing a geographic model that predicts where litter accumulates on coastlines in Norway. The project will help to better understand how geographic variables such as the slope, curvature of the coastline, wind direction and human maritime and land-based activities, among others, drive the accumulation of litter. It generally focuses on ecosystem and biodiversity restoration, sea area protection, and marine ecological corridors.</p> <p>» Main objectives:</p> <ul style="list-style-type: none"> • Try to understand the parameters that affect the amount of marine litter on the shore. • The project will explore the relationship between the amount of rubbish on the shore and the degree of slope, coastline shape, orientation concerning wind and weather and substrate. • Examine connections between amounts of litter and proximity to local sources, such as population density in the area and nearby fishing activity. The model is quantitative and based on extensive fieldwork, followed by independent validation in the field.
Geographic scope	Norwegian coastline, Lofoten archipelago, Agder region and parts of Finnmark.
Target audiences	Nations and regional organisations, NGOs, Coastal communities, Academia (research centres, schools...), General stakeholders (e.g., fishing industry)
Mission Objectives	<p><i>Does the project meet the EU Mission Objectives (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p>i) <i>Protect and restore marine and freshwater ecosystems and biodiversity.</i></p> <p>ii) <i>Prevent and eliminate pollution of our ocean, seas, and waters.</i></p>
Mission Targets	<p><i>Does the project meet the EU Mission Targets (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p>3. <i>Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystems.</i></p>
Project results	<ul style="list-style-type: none"> ● Predictive modelling of the spread and accumulation of marine debris. ● Integrates education and research in complementary marine sciences in Norway. ● GIS map on marine litter.
Potential source of Services and Solutions for the Catalogue	Results and outcomes in the format of different types of methodologies and models, such as the GIS model that predicts where litter accumulates on coastlines.

Criteria	Project analysis
FACE-IT - THE FUTURE OF ARCTIC COASTAL ECOSYSTEMS - IDENTIFYING TRANSITIONS IN FJORD SYSTEMS AND ADJACENT COASTAL AREAS	
Status of the project	<ul style="list-style-type: none"> • <i>Ongoing</i>
Objectives of the project	<p>The FACE-IT project aims to enable the adaptive co-management of social-ecological fjord systems in the Arctic region. To this end, FACE-IT rests upon a comparison of the social-ecological Arctic fjord systems at different stages of cryosphere loss in both Greenland and northern Norway.</p> <p>The FACE-IT project is not the implementation of protection and/or restoration actions of marine/coastal biodiversity and ecosystems per se; the identification and quantification of key drivers of biodiversity changes and their past and future trends – the first objective of the project – is key to guiding evidence-based protection and restoration actions.</p> <p>The project can contribute to drawing lessons that may guide the formulation of recommendations as regards the type, focus and geographic scope of future activities aimed at protecting and restoring marine and coastal ecosystems in the Arctic part of the Atlantic/Arctic lighthouse area against the backdrop of a rapidly changing climate in the region.</p> <p>The overarching objective of the FACE-IT project is to enable adaptive co-management of fjord SES in the Arctic in the face of rapid cryosphere and biodiversity changes. The project will identify ways to manage the impacts of climate change on the cryosphere and marine biodiversity and the interaction with other drivers of change.</p> <p>The four specific objectives of the FACE-IT project are:</p> <ul style="list-style-type: none"> » Identify and quantify key drivers of biodiversity changes and their past and future trends. » Identify cascading effects of changing biodiversity associated with ongoing and projected changes in Arctic coastal food webs. » Assess the interdependencies between environmental changes and Arctic coastal livelihoods. » Support adaptive co-management at local and national levels.
Geographic scope	Arctic seas (7 fjord sites in Greenland and Norway)
Target audiences	Arctic representatives, local authorities, and management authorities; General stakeholders (fisherman, tourism, etc); NGOs and Citizens - having a significant focus on indigenous representation.
Mission Objectives	<p><i>Does the project meet the EU Mission Objectives (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p><i>i) Protect and restore marine and freshwater ecosystems and biodiversity.</i></p>
Mission Targets	<p><i>Does the project meet the EU Mission Targets (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <ol style="list-style-type: none"> <i>1. Protect a minimum of 30 % of the EU's Sea area and integrate ecological corridors as part of a true Trans-European Nature Network.</i> <i>2. Strictly protect at least 10 % of the EU's Sea area.</i>

Criteria	Project analysis
Project results	<p>General data generated:</p> <ul style="list-style-type: none"> ● Data on pelagic primary production. ● Data on production parameters and glacier influence. ● Metadata of the social science data. ● Data on seabird and sea mammal abundance. <p>*Scientific production: 27 articles, 2 theses and 1 book (https://zenodo.org/communities/face-it/search?page=1&size=20&type=publication)</p>
Potential source of Services and Solutions for the Catalogue	Results and outcomes in the format of knowledge sharing and database. Interviews are needed to find out details.
CABFISHMAN - CONSERVING ATLANTIC BIODIVERSITY BY SUPPORTING INNOVATIVE SMALL-SCALE FISHERIES CO-MANAGEMENT	
Status of the project	<ul style="list-style-type: none"> • <i>Concluded</i>
Objectives of the project	<p>The project aims to provide support to stakeholders in understanding the spatial distribution of Small-Scale Fisheries (SSFs) activities and acquire knowledge on SSFs impacts on marine and coastal natural capital (required by the MSFD), which will help to reduce the marine and coastal economy's carbon footprint and help to preserve marine and coastal areas where SSF are active.</p> <p>» Support collaborative management of SSF.</p>
Geographic scope	<p>The project is not based on pilot areas; a multidimensional transnational consortium envisages a broad case study covering the Atlantic Area. Some partners extend their activity throughout the entire national territories, which ensures a complete Atlantic coverage: IPMA (Portugal), IFREMER (France), IEO (Spain), BIM (Ireland) and CEFAS, MASTS and JNCC (UK).</p>
Target audiences	<p>Fisheries stakeholders within Small-Scale Fisheries (SSF) and an additional targeted audience call for effective cooperation in the Atlantic Area. Focused on policymakers and fisheries managers.</p>
Mission Objectives	<p><i>Does the project meet the EU Mission Objectives (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p>i) <i>Protect and restore marine and freshwater ecosystems and biodiversity.</i></p> <p>iii) <i>Make the sustainable blue economy carbon-neutral and circular.</i></p>
Mission Targets	<p><i>Does the project meet the EU Mission Targets (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p>3. <i>Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystems.</i></p>

Criteria	Project analysis
Project results	<ul style="list-style-type: none"> ● Alternative methods for effectively monitoring small-scale fisheries in the Atlantic Area. ● Analysis by mapping, labelling, and counting the cultural heritage from small-scale fisheries in the European Atlantic Area. ● Development of a new evaluation matrix to score and rank perceived small-scale fishing gear impacts. ● Assessing the economic net value of SSF fishing grounds. ● Assessing the perceived impacts of small-scale fisheries gears on marine habitats.
Potential source of Services and Solutions for the Catalogue	Results and outcomes in the format of methodologies and tools, such as the GeoTool (https://cabfishman.net/geotool/) that is an open-access, online web tool designed to provide key evidence supporting management decisions for SSFs in the Northeast Atlantic. It also enables stakeholders to select the most suitable method for their fishery.
LIFE INVASAQUA - AQUATIC INVASIVE ALIEN SPECIES OF FRESHWATER AND ESTUARINE SYSTEMS: AWARENESS AND PREVENTION IN THE IBERIAN PENINSULA	
Status of the project	<ul style="list-style-type: none"> • <i>Close to the end</i>
Objectives of the project	<p>The project aims to reduce the introduction and spread of Invasive Alien Species (IAS) in the Iberian Peninsula by increasing public and stakeholder awareness and developing key tools to improve an early warning and rapid response (EWRR) framework for new IAS in freshwater and estuarine habitats.</p> <p>Contribute to improving invasive alien species management and reducing their environmental, societal, economic and health impacts through information campaigns and the exchange of successful management solutions and practices.</p>
Geographic scope	<p>Iberian Peninsula (Portugal and Spain).</p> <p>The geographical scope encompasses the continental areas of two EU Member States, Spain and Portugal. The estuarine and inland waters of the Balearic Islands and Macaronesia islands belonging to those countries (Madeira, the Azores, and the Canary Islands) are not included.</p>
Target audiences	The citizens and relevant stakeholders (managers & decision-makers, NGOs and scientific community): Public Administration; Surveillance agents; Universities and Research Centres; Museums; Environmental NGOs; Academic associations; Other associations; Commercial and business sectors; Zoos and aquariums.
Mission Objectives	<p><i>Does the project meet the EU Mission Objectives (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p><i>i) Protect and restore marine and freshwater ecosystems and biodiversity.</i></p>
Mission Targets	<p><i>Does the project meet the EU Mission Targets (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p><i>3. Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystems.</i></p>

Criteria	Project analysis
Project results	<ul style="list-style-type: none"> • Create a priority list of invasive alien species and strategic management guidelines at the Iberian level to support and facilitate the implementation of the EU Regulation. • Implementing training and information campaigns with key stakeholders. • Developing communication and awareness activities through volunteering campaigns, citizen science, events with students or travelling exhibits across the Iberian Peninsula.
Potential source of Services and Solutions for the Catalogue	Results and outcomes in the format of methodologies and knowledge sharing and data. Some examples can be the method for performing a transnational horizon scanning focused on inland waters; the blacklist of aquatic invasive alien species; the alert list of potential aquatic invasive alien species threatens aquatic ecosystems and socio-economic sectors. Interviews would be needed to best translate these knowledge output into services and solutions.
4S - SATELLITE SEAFLOOR SURVEY SUITE	
Status of the project	<ul style="list-style-type: none"> • <i>Concluded</i>
Objectives of the project	Project 4S is designed to develop a cloud-based software solution empowering its users to map and monitor seafloor habitats, morphology, and water depth from the comfort of their desks. Throughout this project, the partners are optimising the usability and validity of the software suite in +15 use cases. One central element of the project is the development of SDB-Online.
Geographic scope	Focused on habitats and morphology of seafloor and different water depth habitats.
Target audiences	Not defined.
Mission Objectives	<p><i>Does the project meet the EU Mission Objectives (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p><i>i) Protect and restore marine and freshwater ecosystems and biodiversity.</i></p>
Mission Targets	<p><i>Does the project meet the EU Mission Targets (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p><i>3. Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystems.</i></p>
Project results	List the overall results of the project.
Potential source of Services and Solutions for the Catalogue	Results and outcomes in the format of technology (satellite, software, drones, sensors). The project that as outcome the development of a cloud-based software dubbed 4S (Satellite Seafloor Survey Suite) (https://www.sdb-online.eoapp.de/) that was tested to reach the highest TRL level during the project duration.

Criteria	Project analysis
AZORES NATURA	
Status of the project	<ul style="list-style-type: none"> • <i>Concluded</i>
Objectives of the project	<p>The project covers 24 SACs (Special Areas of Conservation), 15 SPAs (Special Protection Areas) and 2 SCIs (Sites of Community Importance) of the Natura 2000 Network in the Azores, seeking to attain a significant contribution to the conservation of species and habitats protected by the Habitats and Birds Directives that underlie their designation. Implement on-field conservation works identified as needed to improve the conservation status of 24 species and 13 habitats protected by the HD, including recovery of 6 priority habitats and 3 species, and promotion of the complementary signing/interpretation for awareness raising on the conservation goals.</p> <p>Implement habitat improvement works foreseen on the Action Plan for the Azores bullfinch <i>Pyrrhula marina</i> in the European Union to secure its conservation status and promote the complementary signing/interpretation for awareness raising on the conservation goals.</p> <p>Promote control/eradication works targeting IAS and monitor their results.</p> <p>Fill knowledge gaps on distribution and/or conservation status/threats for specific species/habitats.</p> <p>Execute ex-situ conservation actions by collecting and conserving seeds from 80% of the endemic species of the Azores in the Germoplasm Bank at the Botanical Garden.</p> <p>Reinforce the current capability for N2000 surveillance and management.</p> <p>Develop and deliver to technical and operational staff.</p> <p>Develop and set up an operational GIS database required for N2000 management.</p> <p>Reinforce integration of N2000 conservation goals in other sectoral policies.</p> <p>Raise awareness of the local population and relevant stakeholders for the conservation values of N2000 and its worth as an instrument for improving overall life conditions and sustainable development.</p> <p>Raise awareness and engage local agents towards further use of rural development support schemes available through other regional and EU financing programs.</p> <p>Promote sustainable use of N2000 areas.</p> <p>Promote adequate conditions for sustainable use and improvement of private agents' profitability within N2000.</p>
Geographic scope	Prioritised Action Framework for the Autonomous Region of the Azores
Target audiences	Local and regional authorities, researchers, and decision-makers.
Mission Objectives	<p><i>Does the project meet the EU Mission Objectives (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p>i) <i>Protect and restore marine and freshwater ecosystems and biodiversity.</i></p>
Mission Targets	<p><i>Does the project meet the EU Mission Targets (Yes or No)? If YES, which ones?</i></p> <p>YES:</p> <p>3. <i>Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystems.</i></p>

Criteria	Project analysis
Project results	<ul style="list-style-type: none"> ● Management and enhancement of Natura 2000 Network and Regional Network of Protected Areas. ● Strengthening knowledge of biodiversity and its monitoring and surveillance. ● Preserve and restore natural heritage and biological diversity. ● Promotion of sustainable development of the territory.
Potential source of Services and Solutions for the Catalogue	Results and outcomes in the format of knowledge sharing through guidelines, tools, database, and methodologies. Interviews is needed to detail and identify the best outcomes for translating into services and solutions.



2023