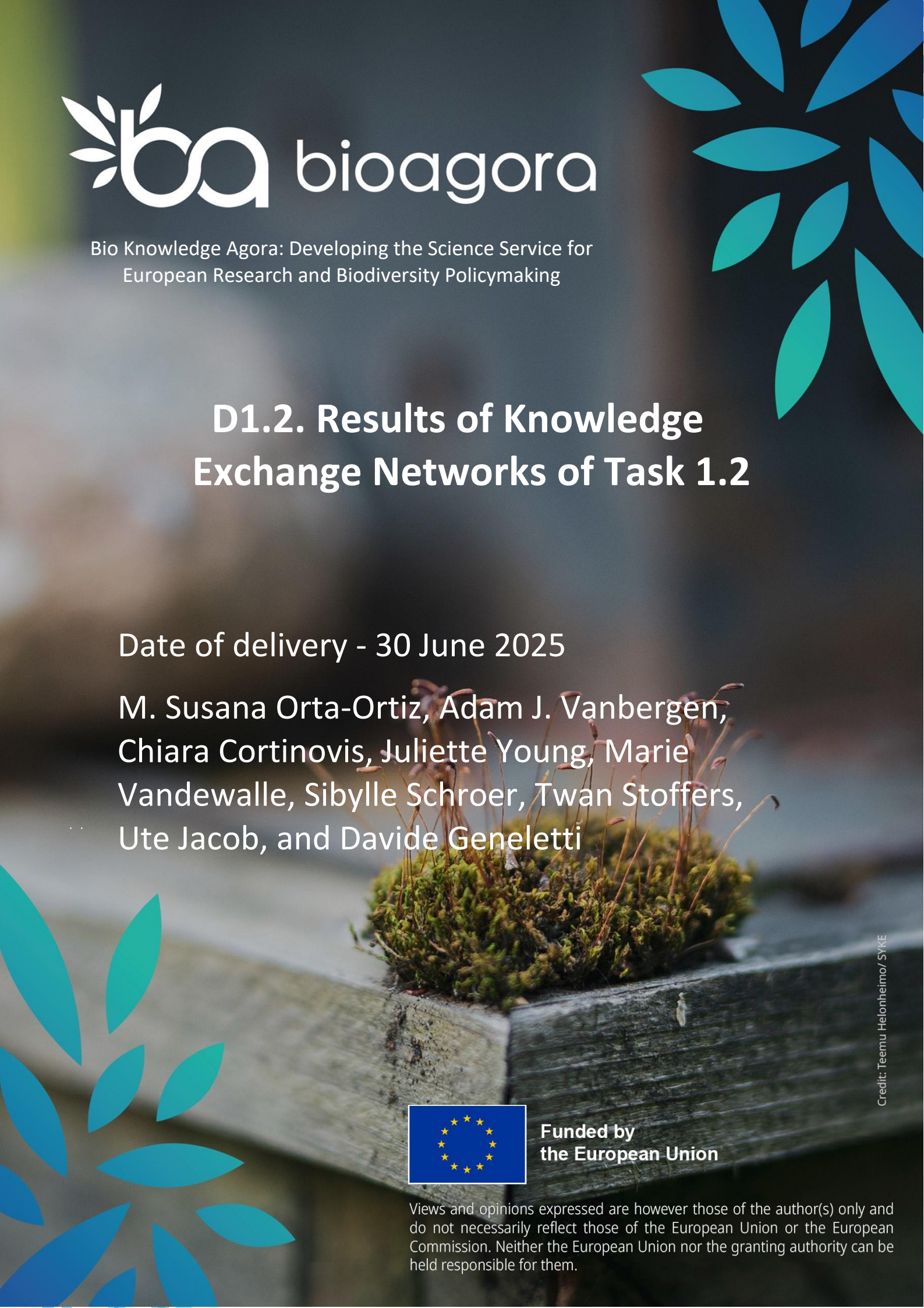
bioagora

Bio Knowledge Agora: Developing the Science Service for European Research and Biodiversity Policymaking

D1.2. Results of Knowledge Exchange Networks of Task 1.2

Date of delivery - 30 June 2025

M. Susana Orta-Ortiz, Adam J. Vanbergen, Chiara Cortinovis, Juliette Young, Marie Vandewalle, Sibylle Schroer, Twan Stoffers, Ute Jacob, and Davide Geneletti



Credit: Teemu Helonheimo/ SYKE

Funded by the European Union

DOCUMENT TRACKS DETAILS

Project acronym	BioAgora
Project title	Bio Knowledge Agora: Developing the SSBD for European Research and Biodiversity Policymaking
Starting date	01/07/2022
Duration	60 months
Call identifier	HORIZON-CL6-2021-BIODIV-01
Grant Agreement No	101059438

Deliverable Information	
Deliverable number	D1.2
Work Package number	WP1
Deliverable title	D1.2. Results of Knowledge Exchange Networks of Task 1.2
Lead beneficiary	UniTrento
Author(s)	M. Susana Orta-Ortiz (University of Trento), Adam J. Vanbergen (French National Research Institute for Agriculture, Food and Environment), Chiara Cortinovis (University of Trento), Juliette Young (INRAE), Marie Vandewalle (UFZ), Sibylle Schroer (Leibniz Institute of Freshwater Ecology and Inland Fisheries), Twan Stoffers (Leibniz Institute of Freshwater Ecology and Inland Fisheries), Ute Jacob (HIFMB), and Davide Geneletti (University of Trento)
Due date	30/June/2025
Actual submission date (update)	30/June/2025
Type of deliverable	Report
Dissemination level	Public
DOI	10.5281/zenodo.15756485

VERSION MANAGEMENT

Revision table			
Version	Revision	Date	Description
1	M. Susana Orta-Ortiz (University of Trento), Adam J. Vanbergen (French National Research Institute for Agriculture, Food and Environment), Chiara Cortinovis (University of Trento), Juliette Young (INRAE), Marie Vandewalle (UFZ), Sibylle Schroer (Leibniz Institute of Freshwater Ecology and Inland Fisheries), Twan Stoffers (Leibniz Institute of Freshwater Ecology and Inland Fisheries), Ute Jacob (HIFMB), and Davide Geneletti (University of Trento)	10/06/2025	First draft
2	Dalia D'Amato (Syke), Maria Blasi Romero (CREAF), Kaisa Korhonen-Kurki (Syke)	22/06/2025	Drafted internally reviewed through written comments
3	M. Susana Orta-Ortiz (University of Trento), Adam J. Vanbergen (French National Research Institute for Agriculture, Food and Environment), Chiara Cortinovis (University of Trento), Juliette Young (INRAE), Marie Vandewalle (UFZ), Sibylle Schroer (Leibniz Institute of Freshwater Ecology and Inland Fisheries), Twan Stoffers (Leibniz Institute of Freshwater Ecology and Inland Fisheries), Ute Jacob (HIFMB), and Davide Geneletti (University of Trento)	25/06/2025	Updated draft after contribution

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Meaning / Full text
DCs	Demonstration Cases
KENs	Knowledge Exchange Networks
SSBD	Science Service for Biodiversity
NBS	Nature-based solutions
KCBD	Knowledge Centre for Biodiversity
EUBP	EU Biodiversity Platform
NRL	Nature Restoration Law
NRR	Nature Restoration Regulation
EU BDS2030	EU Biodiversity Strategy for 2030

BACKGROUND: ABOUT THE BIOAGORA PROJECT

BioAgora is a collaborative European project funded by the Horizon Europe programme. It aims to connect research results on biodiversity to the needs of policy making in a targeted dialogue between scientists, other knowledge holders and policy actors.

Its main outcome will be the development of a SSBD for Biodiversity. This new service will fully support the ecological transition required by the European Green Deal and the European Union's Biodiversity Strategy for 2030.

The BioAgora project was launched in July 2022 for a duration of 5 years. It gathers a Consortium of 22 partners, from 13 European countries, led by SYKE, the Finnish Environment Institute. Partners represent a diversity of actors coming from academia, public authorities, SMEs, and associations.

Funded by the European Union. BioAgora receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101059438.

EXECUTIVE SUMMARY

This document is a deliverable of the BioAgora project, funded under the European Union's Horizon Europe research and innovation programme under the grant agreement No 101059438.

This deliverable, prepared under Task 1.2, presents the first pilot cases of the Science Service for Biodiversity (SSBD). These pilots were carried out through four Demonstration Cases (DCs)—on Pollination, Freshwater Ecosystems, Urban Nature-based Solutions (NBS), and Marine Biodiversity—which tested the operationalisation of the SSBD framework in real-world, policy-relevant contexts.

The term DCs is used throughout this deliverable to refer to the testing activities conducted under BioAgora. In contrast, Knowledge Exchange Networks (KENs)—referenced in the title—represent the intended long-term legacy of the project: operational networks that will carry forward the SSBD functions beyond BioAgora's duration.

Guided by the SSBD functions framework developed by Task 4.2, each DC sought to demonstrate how knowledge can be mobilised and aligned with EU biodiversity policy needs, offering a practical model for the future operation of the Science Service.

The DCs directly addressed pressing EU biodiversity policy needs. The Pollination DC supported the EU Pollinators Initiative—relaunched in 2023 as the *New Deal for Pollinators*—which calls for identifying Key Pollinator Areas and harmonising monitoring efforts across Member States. The Freshwater DC contributed to the EU Biodiversity Strategy 2030 pledge to restore at least 25,000 km of free-flowing rivers, now made legally binding under Article 9 of the Nature Restoration Regulation (NRR). The Urban NBS DC aligned its work with Target 14 of the EU Biodiversity Strategy 2030—requiring Urban Nature Plans for all cities over 20,000 inhabitants—as well as Target 9 on tree planting and Article 8 of the NRR on urban ecosystem restoration.

Collectively, and at this stage of the project, the DCs tested nine of the ten SSBD support functions, structured under three overarching functions as defined by Task 4.2:

- Answering requests and building the evidence base – through activities such as four urgent EC requests and three preparatory exercises for request handling.
- Creating and supporting active thematic networks – via policy alignment, stakeholder engagement, network building, and capacity-building initiatives.
- Transforming science–policy processes – through activities focused on policy integration, horizon scanning, priority-setting, and collaborative research agenda development.

The DCs developed individual roadmaps to guide and monitor the testing of SSBD functions, documenting activity implementation and outcomes. These roadmaps fed into a common reporting template, or factsheet, used to capture each activity's objectives, methods, results, function linkages, and lessons learned. This approach ensured a consistent structure across cases, enabled real-time coordination, and facilitated the extraction of cross-cutting insights for this deliverable.

The testing experience confirmed that the SSBD functions framework operates as a dynamic, interconnected system, where each function supports and reinforces the others. Foundational activities—such as linking with policy frameworks or activating topical networks—laid the groundwork for more complex functions, including responding to urgent policy requests and setting research priorities. Rather than acting as standalone tasks, cross-cutting elements like capacity-building and governance were embedded throughout the process, shaping how all functions were implemented. This interconnected architecture requires coordinated, strategic, and flexible planning that respects both the sequential logic and the synergies among functions, especially across diverse thematic areas.

While the testing confirmed the relevance and utility of the SSBD functions, it also revealed key implementation gaps and instances of limited impact. Functions varied widely in their resource requirements: exploratory tasks like policy alignment or network mapping required minimal inputs, whereas activities such as capacity-building, research prioritisation, and formal responses to requests demanded sustained coordination, methodological support, and broad stakeholder engagement. This disparity contributed to uneven piloting: several functions—such as *Supporting and Monitoring Biodiversity Mainstreaming*, *Horizon Scanning*, and *Building the Evidence Base*—were

only partially tested, covered by a single DC, or addressed implicitly. To ensure meaningful functional coverage, future efforts should allocate resources more evenly, design activities with explicit functional objectives, and document overlaps intentionally and transparently—so that each function's role in the SSBD is clearly demonstrated.

The deliverable identifies key operational lessons from testing the SSBD functions in the DCs. A comparative analysis of recurrent strengths, weaknesses, opportunities, and threats revealed four priority areas for future implementation. First, sustained operational capacity and coordination mechanisms are essential in the future SSBD to manage policy requests, support focal roles, and maintain synergies with external networks. Second, stakeholder engagement should combine timely mobilisation with purposeful inclusion by setting diversity goals tailored to the specific objectives of each activity or request—ensuring representation across sectors, disciplines, knowledge types, and governance levels. Third, participatory methods—such as interactive games and role-play simulations—proved valuable in fostering learning and inclusive dialogue, and should be systematically integrated to generate structured insights and actionable outcomes. Finally, translating scientific knowledge into effective policy guidance requires close collaboration between scientists and policy actors, supported by targeted dissemination strategies. These lessons offer practical recommendations for further developing and institutionalizing the SSBD.

NON-TECHNICAL SUMMARY

This report presents the results of pilot activities carried out under the BioAgora project, funded by the European Union. These pilots tested how a future Science Service for Biodiversity (SSBD) could operate to better connect scientific and practical knowledge with EU biodiversity policy.

The work was conducted through four Demonstration Cases (DCs) focusing on pollinators, freshwater ecosystems, urban nature-based solutions, and marine biodiversity. Each case tested how different SSBD functions—such as responding to policy needs, building expert networks, and identifying research gaps—could be applied in real-world contexts.

The pilots confirmed that these functions are valuable and feasible, but also revealed the need for stronger coordination, sufficient resources, and sustained support. Activities generally followed a step-by-step progression: beginning with engagement with relevant policy frameworks and expert communities, and then moving on to more complex tasks like addressing policy requests or informing research agendas.

They also showed that effective support for public decision-making depends on collaboration among researchers, policymakers, and practitioners. This involves combining scientific evidence with local knowledge, technical expertise, and institutional awareness. Achieving this requires early planning, clearly defined roles, and inclusive outreach strategies. Innovative methods—such as interactive games and role-play—proved particularly useful in engaging diverse participants and fostering dialogue on complex challenges.

Insights from these pilots will inform the development of long-term Knowledge Exchange Networks—collaborative platforms designed to support the SSBD well beyond the duration of the BioAgora project. At their core, these networks exist to advance the implementation of biodiversity commitments.

Table of contents

LIST OF TABLES

LIST OF FIGURES

ANNEXES

1. Introduction

1.1. Aim and structure of the Deliverable

This deliverable, linked to Task T1.2, presents the results of testing the SSBD functions framework across four Demonstration Cases (DCs): Pollination, Freshwater Ecosystems, Urban Nature-based Solutions (NBS), and Marine Biodiversity. Considering that activities for the Marine DC started later than those for the other three, some outcomes of their testing experience will be included as an annex of the 2nd Technical Report.

The deliverable distinguishes between "Demonstration Cases" (DCs) and "Knowledge Exchange Networks" (KENs). DCs—used in the remaining of this deliverable—refer to the piloting phase of the SSBD under BioAgora, aiming to test the operationalisation of the framework in real-world, policy-relevant contexts. KENs, as referenced in the title, represent the emerging legacy of these efforts: operational networks that will carry forward SSBD functions beyond the project's lifetime. While rooted in the DCs, new KENs are also forming independently, applying processes and lessons learned from BioAgora.

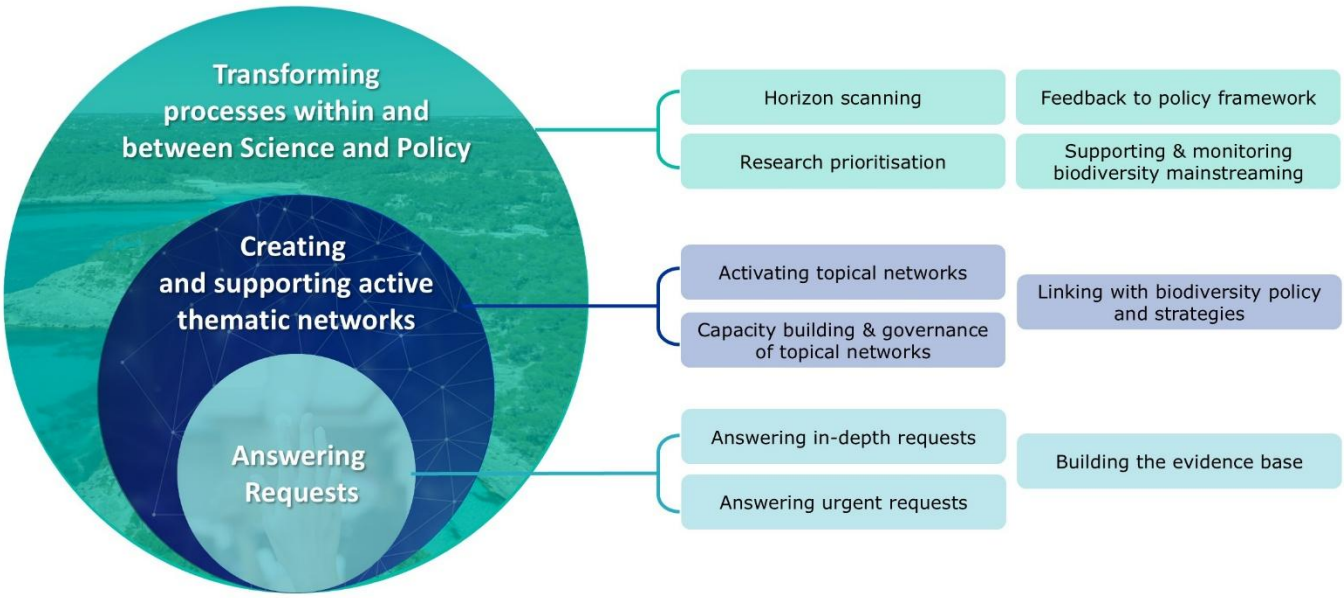
This deliverable showcases the activities and processes carried out by the DCs to operationalize the SSBD in support of implementing EU biodiversity policy. The activities reflect a variety of goals from answering specific policy requests to preparing the ground for such responses through scoping and coordination work, network-building, and knowledge sharing.

The following Section 1.2 introduces the conceptual framework for the SSBD that strategically guided the testing phase. Section 2 outlines the three DCs, explaining their thematic focus and policy relevance, and lists the activities they implemented. Sections 3, 4 and 5 present these activities in detail, grouped under the SSBD's three overarching functions. Specifically, dedicated factsheets for each activity include information on the activity's objectives, methods, results, and connections to other functions, as well as key success factors and challenges. Section 6 extracts lessons learned to guide the further development of the SSBD conceptually and operationally. Finally, Section 7 offers conclusions and next steps, highlighting how this deliverable connects with other parts of the BioAgora project.

1.2. Functions framework for the SSBD

The Task 4.2 in BioAgora project has developed a preliminary framework outlining a set of functions that reflect the ambitions of a transformative, inclusive, and proactively responsive SSBD. This framework guided the strategic role of the DCs in Task 1.2. In collaboration with WP4, Task 1.2 developed a series of consortium-wide workshops during its initial phase to collectively define and refine the SSBD functions, including their purpose and scope. Figure 1 presents the resulting set of overarching and support functions used as a reference for testing activities under this task.

Figure 1: Function framework for the SSBD, containing overarching functions and related set of support functions.



At the core of the SSBD framework is the overarching function of answering requests and building evidence base, supported by two processes: urgent and in-depth requests. This function is designed to improve decision-making by providing relevant, high-quality knowledge in response to clearly articulated policy needs. The distinction between urgent and in-depth requests depends on: (i) the urgency with which policymakers require a response, and (ii) the time needed to generate the response. The choice between the two depends on balancing the policy timeline with the required depth and quality of the knowledge.

- **Urgent requests** respond to immediate policy demands and rely on rapid knowledge overview, typically through expert group input. These are handled within a constrained timeframe of approximately three to seven months from the formal request submission to the SSBD.
- **In-depth requests** require extended periods—up to two years—for comprehensive knowledge synthesis. These processes are coordinated through established knowledge brokering mechanisms such as Eklipse and may also follow as a second phase to a prior urgent response.
- **Building the evidence base** consists of harmonizing existing knowledge repositories or creating new ones in case of absence around a specific DC topic.

The second overarching function of creating and supporting active thematic networks aims to ensure knowledge exchange among diverse stakeholders' groups and actors. A thematic network is understood as the network of a broad range of actors who hold expertise in a particular topic which is directly or indirectly relevant to the implementation of EU biodiversity frameworks. Members of a topical network range from knowledge holders to knowledge users, brokers, and funders, and can include scientists, policymakers, practitioners, NGOs, businesses, citizen scientists and any other relevant social actors. Three support functions are defined:

- **Linking up with biodiversity policy and strategies** ensures that efforts on different fronts at the SPSIs contribute directly and indirectly to implementing existing policy frameworks around biodiversity, including the EU BDS2030, the Nature Restoration Law, Farm2Fork, the Kunming-Montreal Global Biodiversity Framework, and upcoming version of them. It can hence be used to delineate biodiversity-related thematic areas for networks activation.
- **Activating topical networks** aims at mapping and engaging with existing networks and organizations, including EU-funded projects, and other initiatives at the SPSIs, to gather expertise and understand the interlinkages and alignments between their goals, projects, and activities in order to depict their role within the network and the involvement with the SSBD.
- **Capacity building and governance of topical networks** includes targeted capacity-building activities to assist existing networks in supporting and expanding interactions with missing actors and capacitate organizations to create new networks in case these are lacking.

Topical networks will be linked through a two-way platform through the SSBD and will be on the front line to support other functions, e.g., ensuring a timely and meaningful knowledge mobilization for answering urgent requests.

The last overarching function on transforming process within and between science and policy set more transformative processes aimed to guide the strategic development of SP interface. This includes the following support functions:

- **Horizon scanning** aims for the systematic search for, and examination of, potentially significant medium- to long-term threats and opportunities that are not well recognized within a particular thematic field.
- **Research prioritization** implies the identification of specific research topics and questions that should be prioritized based on their significance, potential impact, and alignment with societal needs.
- **Feedback to policy frameworks** involves the contribution of SSBD-generated insights and outputs to ongoing policy development and implementation processes, strengthening the alignment between scientific knowledge and evolving biodiversity policy frameworks.
- **Supporting and monitoring biodiversity mainstreaming** aims at actively exploring ways for integrating SSBD outcomes into diverse policy areas and defining and assessing indicators to measure the extent to which such integration occurs.

2. Overview of the DC testing process

2.1. Introduction of the DC topics

This section presents the three DC—pollination, freshwater ecosystems, and urban NBS—highlighting their definitions, policy relevance, and rationale for selection to test the SSBD functions.

2.1.1. Pollination DC

Pollination was selected as a BioAgora DC because the topic of pollinators and pollination by animals is recognised as having implications for natural ecosystem function and human wellbeing (IPBES 2016) and was already to a high degree mainstreamed in national and international policies and regulations (e.g. EU Pollinators Initiative, NRR). This DC is led by INRAE & UFZ with inputs and links to other partners and WPs e.g. INBO in Pollination DC, WUR in WP2.3.

It focuses on understanding how European research and other relevant actors can help to target and develop policy measures that support the EU Pollinators Initiative in its goals of improving pollinator conservation.

This DC addresses several functions in the BioAgora project framework. It has been directly addressing EC policy needs by working with DG ENV representatives through the EUBP subgroup on Pollinators (EUBP WGP) and the EU Pollinators Initiative to co-design activities in support of the objectives of the EU Biodiversity Strategy, and in particular the specific objectives set out in the EU Pollinators Initiative, the Commission's New Deal for Pollinators and the objectives of the EUBP WGP. It has mobilised a topical network by creating opportunities for joined-up activities between European projects, organisations and experts (workshops, expert elicitation and assessment exercises) that have led to ongoing evidence synthesis and actionable knowledge that will provide relevant information that feedbacks to policy (DG ENV, EUBP WGP) on two specific policy needs for improved pollinator conservation:

- Identifying and improving key pollinator areas (KPA) (habitats, landscapes and connectivity)
- Devising an integrated assessment (& monitoring) framework for evaluating pollinator biodiversity and linked causes and consequences of decline.

This DC feedback to policy was via already established policy connections to intergovernmental organisations (e.g., IPBES, Promote Pollinators), the EU Pollinators Initiative and activity under the auspices of BioAgora (science-policy workshops, evidence synthesis and evaluation).

This DC is also assisting BioAgora project WP2 (T2.1) in assessing the transformative potential of the network (i.e. workshop with select experts from the network and BioAgora). The pollination DC will also assist with the already well-established mainstreaming of pollinators as a biodiversity indicator and flagship in European policy (e.g. EU Biodiversity Strategy, NRL article 10).

2.1.2. Freshwater Ecosystems DC

The Freshwater DC is an interdisciplinary initiative focusing on advancing the restoration of free-flowing rivers across Europe in accordance with the goals of the EU Biodiversity Strategy 2030 target of restoring at least 25,000 kilometers of free-flowing rivers adopted in the legally binding Nature Restoration Regulation, article 9. In this DC, we are testing the core functions of a future SSBD, focus on mapping out and connect with vital networks, identify influential actors, as well as analyze how these groups currently work together, and pinpoint any critical gaps in knowledge and capacity. These activities form the backbone of a strong science-policy interface are essential for embedding biodiversity considerations into effective river management practices.

We chose the restoration of free-flowing rivers as our demonstration case topic because it presents a complex challenge that requires the integration of scientific research with practical policymaking. This challenge is particularly pressing as it addresses not only the conservation of freshwater biodiversity and the maintenance of natural ecosystem functions but also plays a crucial role in achieving the ambitious targets laid out in major EU policies such as the Biodiversity Strategy 2030 and the NRR. The issue of river connectivity is a perfect example of

a multifaceted problem where ecological, hydrological, social, and economic dimensions all interact, a reminder that effective restoration goes far beyond simple technical fixes.

Accomplishing this is not straightforward, as it involves navigating conflicts among various water uses including energy, agriculture, transportation, and flood control. Our approach involves a careful review of current policies and collaborative networks, alongside the development of actionable short- and medium-term strategies designed to bridge existing legislative and operational gaps.

An essential part of our work is establishing a clear and uniform framework for understanding key concepts like free-flowing rivers, barriers, and reference areas. Having such a common language is vital for bringing together all stakeholders, scientists, policymakers, and society at large, and for ensuring that the scientific approach for the restoration efforts are aligned with broader policy goals. By doing so, we help transform isolated pilot projects into a well-connected network of initiatives that can have a large-scale, lasting impact on conservation.

Driven by experts from the Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB) and supported by collaborations with various EU projects and initiatives, our project focuses on dynamic knowledge exchange and ongoing research prioritization. In collaboration with social scientists within the project (T2.3) we engage in shaping the transformative potential of the network of networks. Inter- and transdisciplinary communication is a major step towards the mainstreaming of the BDS target. After the reporting period, the Freshwater DC will communicate with stakeholders in connected Horizon projects and analyze the incentives for the various stakeholder groups researching the overarching history in culture of river and fish in Europe and the member states. This integrated approach not only deepens our understanding of freshwater ecosystem dynamics but also leads to practical, policy-relevant recommendations that can inform adaptive, evidence-based strategies for river restoration.

The Freshwater DC provides an innovative, science-driven blueprint that combines diverse perspectives with tangible actions. It sets a new standard for how we approach the complex task of restoring free-flowing rivers and offers clear, actionable insights for managing freshwater ecosystems in a rapidly changing world. This work bridges the gap between scientific inquiry and policy implementation, ultimately contributing to global efforts in freshwater management and conservation.

2.1.3. Urban NBS DC

This urban NBS DC centers around NBS, defined by the United Nations Environment Assembly as "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits”(UNEP 2022). The DC focuses specifically on the application of NBS in urban contexts, encompassing green spaces and interventions designed to support and enhance natural processes and biodiversity within cities (Castellar et al. 2021).

In urban environments, NBS are increasingly recognized for their capacity to address a broad range of interlinked societal and ecological challenges. In addition to enhancing urban biodiversity and delivering key ecosystem services—such as air purification, temperature regulation, and flood mitigation—NBS contribute significantly to public health, social cohesion, and climate resilience. Research has shown how diverse interventions, including urban forests and parks, green roofs and walls, and sustainable drainage systems, can improve environmental conditions and support overall well-being. These solutions help cities adapt to climate-related risks while fostering more inclusive and livable cities.

Over the past decade, the EU has advanced a comprehensive policy and funding landscape to promote the integration and scaling of NBS. Notably, the EU Biodiversity Strategy for 2030 promotes urban greening and biodiversity through Target 14 and 9. Target 14 aims to bring nature back into cities through the development and implementation of Urban Nature Plans in all European cities with more than 20,000 inhabitants, with the

objective of embedding green infrastructure and NBS systematically into urban planning. Target 9 complements this ambition by aiming to plant three billion trees across the EU. These policy commitments are further reinforced by the Nature Restoration Regulation, which mandates the restoration of urban ecosystems in all Member States under Article 8. Substantial financial resources have supported a wide range of demonstration and innovation projects on NBS. Alongside, the EU has established collaborative platforms and knowledge exchange initiatives —such as NetworkNature, Eklipse, and OPPLA—designed to facilitate stakeholder engagement, build capacities, and bridge gaps between science, policy, and practice in the NBS implementation.

Building on this policy framework and existing initiatives, this DC implemented a set of interconnected activities to facilitate the integration of knowledge on urban greening and biodiversity into decision-making processes. These activities respond to key policy needs in relation to the implementation of the EU Biodiversity Strategy (Targets 14 and 9) and the Nature Restoration Regulation (Article 8). Central to these activities are two processes of knowledge overviews addressing issues explicitly identified by the European Commission. These served as pilot exercises to test the SSBD's key function—answering urgent policy requests. Complementary activities focus on ensuring alignments with biodiversity policy priorities, engaging with and mobilizing expertise from the EU-funded NBS community, eliciting practitioners' knowledge needs for Urban Nature Plans and harnessing the transformative potential of NBS networks. All NBS DC activities are listed in Section 2.2 and detailed in Sections 3.4, 4.4 and 5.4.

2.1.4. Marine DC

At the COP15 UN Conference on Biological Diversity held in Montreal, Canada, and co-chaired by Canada and China 190 nations negotiated the agreement that calls for the protection of 30% of the planet's surface by 2030, called 30 × 30, one of a suite of 23 conservation targets, and hopes to counter the mounting crisis that puts in jeopardy not just the existence of so many plant and animal species around the world, but also the world's food and water supplies. The ocean contains unique biodiversity, provides valuable food resources and is a major sink for anthropogenic carbon. Marine protected areas (MPAs) are an effective tool for restoring ocean biodiversity and ecosystem services, but at present only 2.7% of the ocean is highly protected. This low level of ocean protection is due largely to conflicts with fisheries and other extractive uses. The Marine DC focuses on policy commitments of the Biodiversity Strategy 2030 and the Marine Action plan, such as to 1) legally protect at least 30% of its seas and strictly safeguard at least a third of the EU's protected areas and to 2) substantially reduce the negative impacts of fisheries on sensitive marine habitats and species. The marine DC has built its topical network and focuses on three main functions, capacity-building, answering requests & feedback into policy frameworks.

2.2. Overview of tested SSBD functions

This section provides an overview of the activities implemented by the Pollination, Freshwater, Urban NBS DCs, and Marine DCs to test the overarching and support functions of the SSBD. Indirect contributions to other functions are indicated in the corresponding activity sections.

The list of all activities is listed as follows, grouped by SSBD functions and DC. Each activity is coded with a letter—A for Pollination, B for Freshwater, C for Urban NBS, and D for Marine—followed by a sequential number. Codes related to policy requests are referenced using the official BioAgora ticketing system, which tracks all requests received from the KCBD.

Table 1 offers a quick reference of function coverage and DC involvement, with indications to detailed activity factsheets presented in Sections 3–5.

Answering In-Depth Requests

Pollination DC:

- Activity A1: Conducting a Delphi-type expert knowledge synthesis on wild pollinator pressures using DPSIR framework.

- Activity A2: Conducting a science-policy 'Buzzing table' workshop to assess end-user acceptability of responses identified in the Delphi-type expert elicitation.

Urban NBS DC:

- Activity C1: Reviewing the Eklipse process on Nature-based Solutions and Empowerment Tools for Coastal Communities.

Marine DC:

- Request N.2: Cumulative Impacts of Offshore Wind Farm Expansions: Consequences & Solutions for achieving the GES across European marine waters.
- Request N.3: Blueprint for site-specific conservation objectives for the marine NATURA 2000 sites in the European Sea Basins.

Answering Urgent Requests

Pollination DC:

- Request N.9: Mapping Key Pollinator Areas and connectivity ("buzzing lines"). Process timeline from November 2024 - August 2025.

Freshwater DC:

- Request N.7: Assessing wetland degradation and developing evidence-based monitoring approaches under the Habitats Directive. Process timeline from March 18 to November 30, 2025.

Urban NBS DC:

- Request N.8: Collecting of planning-support tools and related case study applications for informing and monitoring urban greening strategies and nature plans. Process timeline from December 17, 2024 to June 30, 2025.
- Requet N.10: Providing a practical guide for local implementation of green roofs and walls: lessons from European experiences. Process timeline from April 4 to November 30, 2025.

Marine DC:

- Request N.4: Identifying Gaps in Mapping of Marine Habitats across European Seas in support of the Implementation of the NRL.

Linking up with biodiversity policy & strategies

Pollination DC:

- Activity A1: Responded to and worked with DG ENV representatives through the EUBP subgroup on Pollinators (EUBP WGP) and the EU Pollinators Initiative to co-design activities in support of the objectives of the EU Biodiversity Strategy, and in particular the twin objectives set out in the EU Pollinators Initiative.
  NB: Details are included in the factsheet for Activity A1 in Section 3.1.
- Activity A3: Participated as BioAgora observer at bi-yearly meetings of the EuBP WGP.
  NB: No factsheet was provided for Activity A3 as not considered necessary.

Freshwater DC:

- Activity B2: Developing an opinion paper on free-flowing rivers in the NRL.
- Activity B3: Developing a stakeholder-informed policy brief on barrier removal for NRP under the NRL.

Urban NBS DC:

- Activity C4: Conducting a non-systematic literature review on NBS implementation challenges in urban contexts.
- Activity C5: Scoping policy needs through dialogue with key EU-level actors.

Marine DC:

NB: The activities' factsheets will be reported as Annex of the report for the 2nd Technical Reporting.

- Activity D1: Overview of relevant policy frameworks including a crosswalk analysis of 21 Policy Documents regarding their policy targets and objectives.
- Activity D2: Dialogue with policymakers on current topic prioritization in policy to identify most relevant policy needs (March 2024, Brussels, DG ENV, RTD, MARE & KCBD).

Activating topical networks

Pollination DC:

- Activity A4: Mobilizing scientists and stakeholders from EU projects and institutions in various events or workshops

Freshwater DC:

- Activity B4: Mapping and activating a European Rivers Cluster to coordinate EU freshwater biodiversity and restoration projects.
- Activity B5: Organising thematic workshops and special sessions to strengthen networks on free-flowing river policy implementation.

Urban NBS DC:

- Activity C6: Mapping the urban NBS community within NetworkNature+ and related mechanisms.
- Activity C7: Mapping and connecting with actors outside NetworkNature+ working on urban NBS across diverse scales and domains.

Marine DC

NB: The activities' factsheets will be reported as Annex of the report for the 2nd Technical Reporting:

- Activity D3: Mapping and connecting with relevant actors for Marine Biodiversity across local to global scales at the SPI.
- Activity D4: Scoping and subsequent Clustering of relevant HE, Biodiversa+ & ESA Projects.

Capacity building & governance of topical networks

Freshwater DC:

- Activity B6: Co-drafting a guidance embedding adaptive management principles into river restoration under the EU Nature Restoration Law
- Activity B7: Co-drafting and submitting a transformative opinion piece to Current Opinion in Environmental Sustainability, strengthening governance frameworks for thematic networks.

Urban NBS DC:

- Activity C8: Identifying capacity needs at the science-policy interface through interviews with urban NBS experts.
- Activity C9: Conducting a workshop to test elements of the governing principles of the SSBD and build capacity for interdisciplinary interactions and collaborations at the SPSI.
- Activity C10: Conducting a workshop to explore the transformative potential of NetworkNature+.

Marine DC:

NB: The activities' factsheets will be reported as Annex of the report for the 2nd Technical Reporting.

- Activity D5: Kick Off of the DC topical network in Brussels (March 2025) involving the two project Clusters Reducing ByCatch and Restore & Protect Marine Biodiversity.
- Activity D6: Supporting the open consultations for Shaping the European Oceans Pact (2025) & on Banning Shark Finning (2024)
- Activity D7: Roadshow of the DC for Marine Biodiversity (21 presentations for example at the EU BP MEG, HE project GAs, multiple conferences & workshops.

Research prioritization

Freshwater DC:

- Activity B8 – Conducting a pan-European research prioritisation and horizon scanning for river restoration research.
- Activity B9 – Developing the scientific manuscript "Removing barriers: a collaborative research agenda for restoring free-flowing rivers" to translate our prioritised research topics into a structured agenda and policy recommendations.

Urban NBS DC:

- Activity C11: Conducting a Delphi survey to elicit practitioners-led knowledge needs for ambitious Urban Nature Plans.
- Activity C12: Collecting insights from the ESP Conference on technical contents of Urban Nature Plans.

Marine DC:

NB: The activities' factsheets will be reported as Annex of the report for the 2nd Technical Reporting.

- Activity D8: Conducting a survey on ranking Marine Biodiversity Challenges at the SPI.

Feedback to policy frameworks

Pollination DC:

- Activity A1: Presentation of the work on the integrated assessment framework to WGP (June 2024) and to a DG ENV workshop during a session of 22nd European Week of Regions and Cities conference Brussels (October 2024).
  NB: Details are included in the factsheet for Activity A1 in Section 3.1.
- Activity A3: Participated as BioAgora observer at bi-yearly meetings of the EuBP WGP.
  NB: No factsheet was provided for Activity A3 as not considered necessary.

Freshwater DC:

- Activity B10 – Assessing barrier (and removal) impacts on migratory fish and crafting a prioritisation framework to guide NRPs under the NRL.
- Activity B11 - Participating as BioAgora representative in the EUBP expert subgroup on the NRL.

Urban NBS DC:

- Activity C13: Providing feedback to the NRR implementation strategy document on the draft typology of measures related to urban habitats.
- Activity C14: Participating as observers in the EUBP working group on Green Infrastructure.

Marine DC:

NB: The activities' factsheets will be reported as Annex of the report for the 2nd Technical Reporting.

- Activity D9: Results from requests (6, 17, 19) will directly support and feed back into the MSFD and the marine elements of the Nature Restoration Regulation.

Supporting & monitoring biodiversity mainstreaming

Freshwater DC:

- Activity B12 - Exploring interdisciplinary synergies among economic, social, and environmental pillars through stakeholder dialogue in the Danube Basin.

Building the evidence base

Urban NBS DC:

- Activity C15: Joining NN+ Task Force 1 on data and knowledge sharing.

Table 1: Overview of the activities conducted by the three DCs to test the different SSBD functions, with indication on where they are described in this report

SSBD Functions	Pollination DC		Freshwater DC		Urban NBS DC		Marine DC	
Overarching function of answering requests								
Support function of answering in-depth requests	Activity A1 Activity A2	**Section 3.1**	-		Activity C1	**Section 3.3**	Request N.2 Request N.3	**Section 3.4**
Support function of answering urgent requests	Request N.9		Request N.7	**Section 3.2**	Request N.8 Request N.10		Request N.4	
Overarching function of creating and supporting active thematic networks								
Support function of linking up with biodiversity policy & strategies	Activity A1-A3*	**Section 3.1**	Activity B2 Activity B3	**Section 4.2**	Activity C4 Activity C5	**Section 4.3**	Activity D1 Activity D2	**
Support function of activating topical networks	Activity A4	**Section 4.1**	Activity B4 Activity B5		Activity C6 Activity C7		Activity D3 Activity D4	
Support function of capacity building & governance of topical networks	-		Activity B6 Activity B7		Activity C8 Activity C9 Activity C10		Activity D5 Activity D6 Activity D7	
Overarching function of transforming processes within and between science and policy								
Support function of research prioritization	-		Activity B8 Activity B9	**Section 5.1**	Activity C11 Activity C12	**Section 5.2**	Activity D8	**

<table>
<tr><td>Support function of horizon scanning</td><td colspan="2">-</td><td colspan="2">-</td><td colspan="2">-</td><td colspan="2">-</td></tr>
<tr><td>Support function of feedback to policy frameworks</td><td>Activity A1-A3*</td><td>Section 3.1</td><td>Activity B10
Activity B11</td><td rowspan="2">Section 5.1</td><td>Activity C13
Activity C14</td><td>Section 5.2</td><td>Activity D9</td><td>**</td></tr>
<tr><td>Support function of supporting & monitoring biodiversity mainstreaming</td><td colspan="2">-</td><td>Activity B12</td><td colspan="2">-</td><td colspan="2">-</td></tr>
<tr><td>Support function of building the evidence base</td><td colspan="2">-</td><td colspan="2">-</td><td>Activity C15</td><td>Section 5.2</td><td colspan="2">-</td></tr>
</table>

**No description is provided for Activity A3 as described within Activities A1-A2.*

***The description of these activities will be provided as an Annex of the report for the 2nd Technical Reporting.*

3. Answering requests

This section outlines the activities undertaken by the four DCs under the support functions of answering in-depth and urgent requests. It includes both preparatory actions for handling policy requests and activities related to processing responses to requests received through the KCBD. The following activities are described in detail in the subsequent sections:

- Activities A1, A2 and Request N.9 (Pollination DC)
- Request N.7 (Freshwater DC)
- Activity C1 and Requests N.8 and N.10 (Urban NBS DC)
- Requests N.2, N.3, and N.4 (Marine DC)

3.1. Pollination DC

Activity A1: Conducting a Delphi-type expert knowledge synthesis on wild pollinator pressures using DPSIR framework.	
Main support function: Answering in-depth requests	**WPs involved:** WP1
Objective: Evidence synthesis to conceptualise an Integrated Assessment Framework (IAF) for wild pollinators	
Method/approach: This activity predated the KCBD ticketing system, instead it arose from bilateral exchanges between BioAgora (INRAE/UFZ) and DG ENV and the participation of BioAgora partners in the EUBP WGP (Working Group on Pollinators comprising DG ENV, MS representatives and invited stakeholders - BioAgora is an invited observer). The BioAgora pollination DC together with DG Env and other research projects and institutions, codeveloped an online scoping workshop in June 2023 (titled POLLINATOR DECLINE AND THE EU POLLINATOR INITIATIVE –EUPI) involving 23 scientific and policy experts representing different European-funded projects. The assembled experts workshopped two declared policy needs of the EU Pollinators Initiative (BD2030) and the EUBP WGP. These policy needs were: 1) to identifying and improving Key Pollinator Areas (KPA) in the European landscape and their connectivity (buzzing lines); 2) to develop an Integrated Assessment Framework (IAF) for monitoring of pollinator biodiversity and linked causes and consequences of decline. A brief resume of the meeting was produced for the participants of this scoping workshop. In 2024, following the first meeting of the EUBP WGP at the end of 2023, BioAgora took the decision to move forward with the Policy need 2 and use the activated network of research institutions to conceptualise an *Integrated Assessment Framework (IAF) for wild pollinators.* An Integrated Assessment Framework (IAF) is a systematic approach for evaluating knowledge in ways that provide a method for establishing a general and integrated view of a multidimensional environmental or socio-economic problem & identify potential solutions. The BioAgora pollination DC directly collaborated with the H2020 Safeguard project (https://www.safeguard.biozentrum.uni-wuerzburg.de/) on this task, which had a specific WP and objective centred on developing an IAF. The overarching IAF framework adopted was the DPSIR model (Drivers-Pressures-State-Impacts-Responses), which allowed framing the issues around pollinators and pollination in different policy-relevant environments (agriculture, urban and semi-natural). Although not formally an Eklipse process, this activity corresponded to a large degree with this type of expert working group and knowledge synthesis over a longer time span (>8 months). We organised a Delphi-type expert elicitation inviting 51 experts (42 accepted) across the Europe from the topical network, following previous experience (Dicks et al, 2021). Experts used their knowledge of evidence to score (using the (D*)PSIR framework and a 5 point-Likert-like scale) the *importance* of different Pressures affecting the State of wild pollinators and to various Impacts on the benefits to nature and human society that pollinators can provide. Experts also scored the *effectiveness* of Responses (policy) in mitigating these Pressures or improving the State and their level of certainty (following IPBES 4-box model method). Online briefing sessions (1 x 30 minutes recorded and circulated), a standard protocol and scoring template (Excel), guidance documents (scope of the assessment and a glossary listing and defining the parameters), a two-stage scoring process separated by debriefing group discussions (2h by video link) aimed to ensure all scorers understood the scope, aims and methods and had the chance to adapt their scores following iterative expert group deliberations. The details	

on guidance and precise scoring protocol for this evidence assessment is published as a deliverable of the H2020 Safeguard project (D5.3 Conceptualisation and stakeholder validation of the Integrated Assessment Framework (IAF) for pollinators for different policy sectors and scales).
Nb: (D) Indirect drivers were taken from IPBES 2019 global assessment and not scored in this expert elicitation*.

Linkages with other support functions:

- Support function of linking up with biodiversity policy & strategies
- Support function of activating topical networks
- Support function of feedback to policy frameworks

Summary of results:

Here we report on the results of the expert elicitation procedure rather than details specific to pollinators because the specific results concerning the scoring of importance/effectiveness of PSIR to wild pollinators are published as part of a Safeguard project deliverable (D5.3) submitted to the EC (12/2024).

Composition of expert network involved in the evidence assessment. 42 scientific experts from 15 countries & 25 research organisations accepted to carry out the individual-based assessments during 2024. Efforts to balance the composition of the expert panel for gender and career stage resulted in 17 female and 25 male participants, with 29 in permanent research positions and 13 in non-permanent, post-doctoral research positions. In terms of regional balance across Europe, we obtained contributions from Northern (6, 14%), Western (16, 38%), Southern (10, 24%) and Central (8, 19%) European experts, according to their host institution and not their individual nationality. 30 experts came from the Safeguard consortium and 12 experts from other Horizon Europe or national projects.

Expert elicitation procedure. The methodology was pre-tested at INRAE building on previous experience (Dicks et al 2021), but nonetheless following the first round of scoring according to the collective feedback from experts the protocol was refined and modified. Despite the provision of explicit briefing and guidance, individual (and sometimes collective) misunderstandings or different interpretations happened. These concerned the scope or intended framing of certain parameters to be scored, relationships between parameters in the PSIR framework, or questions around temporal or spatial scale. The main problem identified concerned the definition of the various 'State' variable and their links to 'Impacts' and 'Pressures'. This was resolved through the collective discussions of the expert group that reached by consensus a greater precision on the individual parameters in the scoring matrix and refinements to the scope (e.g. timescales considered, spatial scale of effects being scored).

Time to complete the scoring exercise. Based on testing it had been estimated to take about 4 hours for a participant to carry out the independent, desk-based scoring of PSIR using the protocol and scoring sheet provided. Reports from scorers varied widely with some people reporting that it took them about half a day, while others reported longer (e.g., 1-2 days) to complete the first round of scoring. Some of this problem was due to the issues with the protocol (reported above), but a part may also be due to differences in personality or character of the participants, that make them more or less hesitant or comfortable with making rapid 'on average' style type judgements. The second round of independent re-scoring following the deliberative reflection on their original scores and redefinition of the procedure after round 1 feedback, appeared to diminish the time required for most scorers and ease some of the hesitancy. The original estimate of the total time for the scoring process (briefing two rounds with iterative deliberation) had been 6 months (January-June 2024). In practice, with the time for procedure amendments and agendas of voluntary participants, the actual time ran to 9 months (January-September 2024) to complete the data collection.

Success factors (detailed in Annex 6):	**Challenging factors (detailed in Annex 6):**
• Mobilisation of a network of unpaid voluntary experts. • Iterative process to allow deliberative reflection, consensus building and modification to procedure • Targeted individual invitations explaining the scope, objective and outputs with incentives (paper/policy impact production) to leverage participation. • Gender, career stage and geographical balance was relatively successful. • Data obtained is comprehensive with potential to generate scientific impact (paper development in 2025/6) and policy impact (simultaneous policy brief to inform ongoing policy need in 2025/6).	• Despite preparation and testing, some variation in individual interpretation of a standard protocol happened in the first round. • Unfamiliarity with this methodology, coupled to the fact that some individuals find it harder than others to make 'overall' judgements. • Time delays incurred because of protocol issues, but also due to time availability for voluntary participants. Some minor turnover of scorers (n=2) between round 1 & 2 because of time constraints. • Data obtained requires time to analyse, and this is hampered by lack of junior scientist support meaning time demands on senior scientist slows delivery of this part.

References:

Dicks, L.V., Breeze, T.D., Ngo, H.T. et al. A global-scale expert assessment of drivers and risks associated with pollinator decline. Nat Ecol Evol 5, 1453–1461 (2021). https://doi.org/10.1038/s41559-021-01534-9

IPBES. (2016). Summary for policymakers of the assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production. Zenodo. https://doi.org/10.5281/zenodo.2616458

IPBES. (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services (summary for policy makers). IPBES Plenary at its seventh session (IPBES 7, Paris, 2019). Zenodo. https://doi.org/10.5281/zenodo.3553579

Activity A2: Conducting a science-policy 'Buzzing table' workshop to assess end-user acceptability of responses identified in the Delphi-type expert elicitation.

Main support function: Answering in-depth requests	**WPs involved:** WP1

Objective: Obtain stakeholder feedback on the 'acceptability' according to end-user perspectives of the RESPONSES identified as most effective in the expert elicitation exercise (Activity A1).

Method/approach:

The expert elicitation (**Activity A1**) was then followed a science-policy 'Buzzing table' workshop 'Gaming policies for a pollinator-friendly landscape' (16/12/2024, Brussels), was the product of a collaboration between BioAgora and H2020 Safeguard projects. Participating stakeholders were tasked with identifying the *acceptability* of the Response options identified by the expert scoring (**Activity A1**) as being effective (score ≥ 3). in improving the State of wild pollinators and Impacts (ecosystem benefits) obtained. To obtain decision-maker judgements on the acceptability the BioAgora pollination DC mobilised a team from the University of Stirling (UK) with expertise in using game theory for decision making. The purpose of the serious game is to visualize decision outcomes and spark deliberation and debate over choices and options rather than produce a precise decision support tool or protocol to follow.

With input from INRAE on the expert elicitation results (Activity A1), the University of Stirling group designed and built an online interactive game. This game allowed participants to choose and visualize over a 5-year cycle the results of policy/management Responses for the State of and Impact on wild pollinators in a simulated virtual landscape of agricultural, seminatural, urban areas. By using the data from Activity 1 we were able to attribute to game parameters levels of variability commensurate with the scores and ecological reality so that the choices taken present a simulation of natural spatial-temporal variation and uncertainty and reflect such variability in outcomes. To reduce the complexity of the decision taking and subsequent visualization in the game, the INRAE/Stirling team identified a subset of Response (from those scored by experts as effective), State and Impact variables for gaming.

In the game, players were able to select and implement in the simulation several policy Responses (Recreating or Restoring Ecological Zones (applicable to agricultural, urban and semi-natural zones); Nature Protection Regulations (agricultural, urban and semi-natural zones); Ecological intensification of agriculture (agricultural zones only); Urban greening (urban zones only). The players were able to visualize the resulting effect on the various State variables: Wild Pollinator abundance and diversity; Floral resource diversity and abundance; and other Habitat resources (e.g. nest sites) as well as outcomes in terms of Impact on ecosystem services: Crop pollination; Economic value chain; Wild plant pollination; Aesthetic values. Players could decide to implement Responses at the entire landscape scale or in smaller zones, equivalent to a farm, a city quarter or patch of semi-natural habitat and immediately (seconds) witness the outcomes over the 5-year time cycle.
After playing the game individually and in small groups the participants were able to discuss together and reflect on the choices and outcomes and provide their feedback on the policy responses and the gaming tool itself.

Linkages with other support functions:

- Support function of linking up with biodiversity policy & strategies
- Support function of activating topical networks
- Support function of feedback to policy frameworks

Summary of results:

Science-policy 'Buzzing table' workshop '*Gaming policies for a pollinator-friendly landscape*' Representatives of a total of 4 research organisations (University of Stirling, University of Reading, TU Delft, INRAE) and 10 stakeholder organisations (DG ENV, DG AGRI, Copa-Cogeca, IEEP, ELO, Promote Pollinators, IFOAM, The Pollinators.org, Butterfly Conservation

Europe, IUCN) participated in the workshop on 16/12/2024. 16 individual gamers from these organisations played the simulation and then reflected in 3 break-out groups and collectively in a plenary session on the choices taken regarding policy Responses and outcomes for States and Impacts visualised. A stakeholder-facing report was created by ELO with inputs from INRAE/IUCN/University of Stirling and sent to the participants that summarised the groups perspectives and insights on the game's strengths, weaknesses, and areas for potential improvement. Below we summarise some key points from that report:

- Overall, the decision makers from policy and NGO institutions present in the workshop appreciated the development of such a new game tool that can facilitate informed and effective policymaking, its potential for education/learning for promoting conservation and the positive impact such a tool can have in building trust in stakeholder communities and actively engaging them in conservation decision-making processes.
- A need for a more comprehensive simulation that incorporates the costs/constraints and policy conflicts associated with implementing conservation actions, to highlight potential trade-offs
- A need for greater transparency concerning the data underlying the model of the game, to better understand the underlying mechanisms driving specific outcomes.
- The importance of presenting the game from the perspective of local decision-makers, considering economic and aesthetic factors as primary concerns.
- A consistent trend: restoring and recreating habitats were frequently identified as the most effective strategies across all habitat types.
- The need to incorporate a broader range of potential states and outcomes (e.g. pest & weed pressure on economic values), including negative effects, to create a more realistic simulation of real-world challenges.
- A wish to see if simulation of how management intervention effects taken in one landscape cell may spillover to adjacent cells with a decay function with increasing distance to simulate pollinator mobility in the virtual landscape.
- Improving the feedback interface to show more in-game visualisation of the history of cause-effect arising from choices taken would better allow players to view and learn from previous decisions and enable them to refine their strategies.

Another workshop jointly organized by BioAgora-Safeguard is planned for a later date (autumn 2025) with a new game modified to address the feedback and to obtain more definitive data on the 'acceptability' according to end-user perspectives of the RESPONSES identified as most effective in the expert elicitation exercise. Decision data (e.g. frequency of choice) in this second workshop will be collected, anonymized and analyzed adhering to GDPR.

Success factors (detailed in Annex 6):	**Challenging factors (detailed in Annex 6):**
• Gaming tool methodology proved successful in attracting stakeholders to the workshop and animating the deliberative discussions. • Effort in creating an attractive flyer & Brussels location during an 'Event week' was useful in attracting registration • Partnership with stakeholder organisations (ELO, IUCN) assisted the focus of the workshop & obtaining participation. • Feedback on how to improve the gaming tool was readily obtained.	• Feedback on the acceptability of responses (workshop main aim) was less forthcoming, with most focus placed on the 'wished for' functionality of the tool. • Insufficient time spent on presenting & detailing the accompanying expert elicitation and data obtained meant that 'gamers' uncertainty was increased and decreased confidence in the simulation. • More pre- and in-workshop guidance is needed to increase transparency of the method and reduce perceived problems.

Request N.9: Mapping Key Pollinator Areas and connectivity ("buzzing lines") **Timeline: November 2024 - August 2025.**	
Main support function: Answering urgent requests	**WPs involved:** WP1, WP4
Objective: Provide access to science expertise in the pollinator topical network to support ongoing work by EEA/ETC-BE for the identification and eventual mapping of Key Pollinator Areas (KPAs) and their connectivity (buzzing lines	
Method/approach: An urgent request for a workshop from DG Env to assist the work of the EEA/ETC BE. This work is the continuation of an in-depth analysis (by EEA/ETC Biodiversity & Ecosystems) and discussions to support the EUBP Pollinator Working Group. It is intended to facilitate the selection of appropriate measures and actions needed to reverse pollinator decline both under the actions of the EU New Deal for Pollinators and under the Nature Restoration Regulation. The aim is to discuss and further develop the approaches to identify and map Key Pollinator Areas (KPAs) in the European	

landscape, and based upon these, further develop the approaches for the identification of Buzz lines (corridors of connecting pollinator-friendly habitat). Both aspects (KPAs and Buzz-Lines) will be based on a report developed by the EEA/ ETC BE (Task 1.1.32), which has the aim to provide a first, preliminary draft proposal and thus shall serve as a starting point for further discussions. This request is aimed at creating a joint stakeholder and scientific expert consultation carried out via a workshop (3-4 July 2025) involving experts from the wider scientific community, agencies and structures (EEA, ETC-BE, JRC) and policy experts (DG Env). This workshop will be tasked with refining of the draft criteria for defining KPAs. The workshop will be divided into two parts: Day 1: definitions and approaches for identification of KPAs and buzz-lines; Day 2: Exploring options to map KPAs, defining the on-the-ground requirements to guide a pre-selection of suitable researcher teams able to develop appropriate tools (e.g. dashboard maps).
Linkages with other support functions: • Support function of linking up with biodiversity policy & strategies • Support function of activating topical networks • Support function of feedback to policy frameworks
Summary of results: A total of 24 participants signed up by 25/06/2025 for a workshop on 3-4 July 2025. A report is to be delivered to the requester (DG Env) and participants (August 2025).

Success factors: TBD (activity still on-going)	**Challenging factors:** TBD (activity still on-going)

3.2. Freshwater DC

Request N.7: Assessing wetland degradation and developing evidence-based monitoring approaches under the Habitats Directive. Timeline: March 18th to November 30th , 2025.	
Main support function: Answering urgent requests	**WPs involved:** WP1 (T1.3 Task) and WP4 – Task Force of Answering Requests
Objective: Request N.6 (Wetlands and monitoring) Technical report that includes a table of the wetland habitat types considered and their pressures and threats. To provide additional information on the characteristics of degraded habitats and well-functioning habitats to assist national experts in evaluating and reporting the conservation status of wetlands (Article 17, Habitats Directive). To better understand the signs of a well-functioning wetland and the impacts of threats and pressures, which may be detectable using Earth Observation (EO).	
Method/approach: The request was received in January. The Document of Work was discussed thereafter during two meetings with the requesters (DG ENV, KCEO) to narrow the broad subject of wetlands and to focus on several wetland types. The habitat types that will be the focus of the request will be selected from a document provided by the KCEO listing wetland habitat types of the Habitats Directive Annex I. The experts will elaborate wetland types of two groups either (1) boreal Mires, Sphagum acid bogs at temperate heaths and (2) coastal and salt habitats. For each wetland habitat type, experts will: • Describe the key ecological processes and features that constitute a well-functioning state of that habitat • Identify the primary pressures and threats affecting these habitats, ranking them by impact and likelihood • Characterize the ecological response pathways to these pressures, detailing the cascade of effects • Establish a ranked hierarchy of degradation indicators, from early warning signs to indicators of severe and potentially irreversible deterioration. The deadline of the deliverable for feedback is October 2025, the final deliverable is due November 30 2025.	
Linkages with other support functions: N/A for the Freshwater DC	
Summary of results: A comprehensive ecological characterization of each selected habitat type, including analysis of pressures and threats, and description of degradation pathways and response indicators. The report shall include case studies of wetland degradation and recovery. Further, standardized assessment tables for each habitat type including where possible: • Key ecological parameters with reference values for good functioning • Ranked list of pressures and threats with severity assessment • Indicators of degradation with threshold values	

• Ecological parameters that change in response to pressures • Temporal dynamics of these changes (rapid vs. gradual) • Physical manifestations of ecological degradation • Threshold values indicating transition between ecological states And last, a blueprint methodology: A description of the overall assessment methodology and criteria used, to be demonstrated on one habitat type and designed for application to other habitat types.

Success factors (detailed in Annex 6):	**Challenging factors (detailed in Annex 6):**
• Observing the process of a ticket for the SSBD. • Further benefits might come up, for example to transfer knowledge about the importance of free-flowing rivers for the good ecological state of several wetland types.	• The current ticket does not involve river habitats. • The lack of a ticket targeting the NRL article 9, is an issue as lobbyists of hydropower can oppose the NRL target with referring to the Renewable Energy Directive (RED (EU) 2023/2413). We urgently need discussions and requests on this subject of the BD target to restore free-flowing rivers. • The analyzed networks of the freshwater DC did not match the search for experts. Thus, only few experts were found. • Experts are concerned with the application of EO methodologies to extract conclusions, because water in peatlands is difficult to identify with EO

3.3. Urban NBS DC

Activity C1: Reviewing the EKLIPSE process on Nature-based Solutions and Empowerment Tools for Coastal Communities.	
Main support function: In-depth answering request	**WPs involved:** WP1
Objective: In order to become familiar with the Eklipse in-depth answering request mechanism, the urban NBS DC focal points served as reviewers in an Eklipse process. The report "How can community Empowerment Tools (ET) and Nature-Based Solutions (NBS) contribute to addressing coastal challenges and building resilient communities?", prepared by an Eklipse Expert Working Group following the request by the EmpowerUs project was reviewed.	
Method/approach: The review was conducted following Eklipse guidelines in April 2024.	
Summary of results: Future DC focal points learned about the Eklipse mechanism and the methods and level of detail involved in an in-depth answering request process.	
Linkages with other support functions: Answering urgent requests	

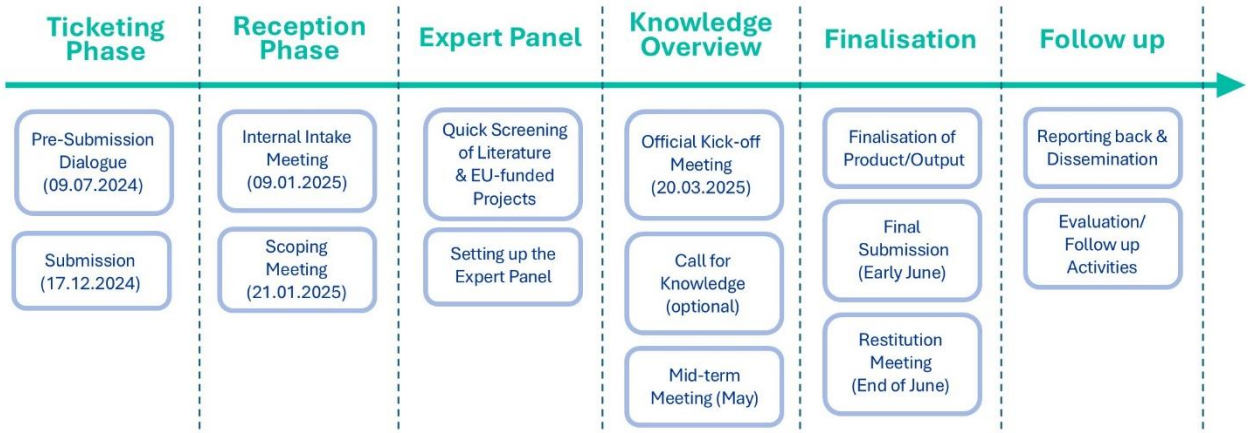
Request N.8: Collecting of planning-support tools and related case study applications for informing and monitoring urban greening strategies and nature plans. **Timeline: December 17th , 2024- June 30th , 2025.**	
Main support function: Answering urgent requests	**WPs involved:** WP4 – Task Force of Answering Requests
Objective: This ticket responds to DG ENV's knowledge needs regarding planning-support tools to aid cities and urban planners in developing Urban Nature Plans and achieving targets for green space and tree canopy cover, as outlined in the EU Biodiversity Strategy for 2030 and the Nature Restoration Regulation (NRR). These tools—understood as software, methods, or modelling approaches—are designed to generate and process (spatial) information on biodiversity and ecosystem services. The requester has asked for a handbook that addresses two main questions:	

- What planning-support tools are available, how can they specifically assist cities in developing greening strategies and actions, and what data do they require?
- What good-practice examples exist that showcase the use of these tools, and how transferable are they to other European cities?

The handbook will present a curated collection of tools, detailing their relevance to different stages and tasks in the development of urban greening strategies. It will include illustrative case studies and an assessment of the tools' transferability across diverse European urban contexts. Ultimately, it aims to support the design, implementation, and monitoring of Urban Nature Plans.

Method/approach: This ticket was addressed using the knowledge overview model, following the procedural steps shown in Figure 2. The model was selected as the first available option from the Answering Request Task Force to pilot the answering request function, while also meeting the need to respond to an urgent request within a few months.

Figure 2: Knowledge overview prototype for urgent requests



Summary of results: The testing of the knowledge overview prototype largely followed the initially defined steps (Figure 2), with minor adjustments and additions to ensure a smooth implementation process.

The ticket topic was jointly identified during early dialogue between the NBS DC, DG ENV, and KCBD, prior to its formal submission in December 2024. Shortly after, an internal intake meeting confirmed the NBS DC's responsibility for handling the ticket, reviewed the steps of the selected answering model, and agreed to forgo a second intake meeting with KCBD, given the thoroughness of the pre-submission discussion. Two focal points from the DC were appointed to coordinate the process. A scoping meeting, held a few weeks after reception, led to the drafting of the Agreement of Work, which outlined the objectives, scope, roles, and timeline, and was validated and accepted by all parties shortly thereafter.

Between the acceptance of the Agreement of Work and the official kick-off, a seven-week period was dedicated to set up the Expert panel and prepare for meeting with the Requester. Experts were identified through a structured selection process, drawing on the EU-funded NBS community. We began by screening past and ongoing EU projects using databases such as NetworkNature+, CORDIS, and Biodiversa+, and contacted project coordinators to recommend suitable experts from their networks. Formal invitations were then sent to suggested candidates. In parallel, we reviewed relevant planning-support tools and their developers and consulted scientific literature to further expand the pool of expertise. The screening of projects was based on keywords search and reviews of their websites, work packages and deliverables.

The final panel included 16 experts from a total of 22 invitations sent to project coordinators and individual experts from the NBS DC network. The panel, shown in Table 2, balanced academic and practical knowledge, ensuring scientific rigor alongside relevance for real-world application. Participants included representatives from universities, research institutions, city administrations (e.g. Glasgow City Council), consultancies, and policy-oriented organizations such as ICLEI. This same balance guided the selection of two co-chairs from among the panelists, tasked with leading scientific

coordination among experts. Attention was also paid to geographic diversity, reflecting a range of European planning systems, as well as to gender balance.

Table 2: Expert Group for Request N.8 on Urban Greening Planning Tools

Affiliation	Stakeholder category
Glasgow City Council	City administrations
EOSA	Consultancies
Tecnalia	
ICLEI	Policy-oriented organizations
South West Water	Private company in the water sector
Adam Mickiewicz University	Universities / Research Institutions
Ecologic Institut Gemeinnutzige Gmbh	
European Forest Institute	
Humboldt Institute (Bogotá, Colombia)	
Humboldt Universität zu Berlin	
Institute of Environmental Sciences, Leiden University	
Leiden University	
Politecnico di Milano	
UK Centre for Ecology & Hydrology	
University of Antwerp	
University of Trento	

Two preparatory meetings with the expert panel were held prior to the kick-off: the first introduced the project, the process, and the group's roles; the second focused on appointing co-chairs, refining key questions for the Requester, and outlining the structure of the deliverable.

The kick-off meeting formally introduced the Expert Group to DG ENV and KCBD and opened a discussion on key issues and expectations related to the request. Key aspects included clarifying the purpose and audience of the report, discussing the scope and definition of tools to be included, and outlining initial ideas for structuring the handbook and ensuring its practical utility and long-term relevance.

The Expert Group followed a structured process involving coordinated meetings—both with the full group and among the Co-chairs—and multiple rounds of expert input. Guided by the Co-chairs, experts identified and reviewed tools in phases, with regular check-ins to refine content and ensure alignment with the Requester's expectations. This process led to the submission of a draft deliverable structure to DG ENV and KCBD ahead of the mid-term review.

After the mid-term meeting, Experts entered the phase of tools descriptions based on agreed assessment criteria with the Requester. The 61 listed tools were distributed among the Experts ensuring that each tool was reviewed independently by two Experts. A thorough tools description phase was conducted after mid-term meeting using a Google form survey.

A call for knowledge was issued to invite the broader community to contribute information on Urban Greening Planning Tools and to identify any additional relevant tools not already listed by the Experts. The call was disseminated through the NetworkNature+ platform and BioAgora's social media channels. It was launched in early June and remained open for two weeks until June 15. A total of 19 responses were received.

Linkages with other support functions:

- Activating topical networks: The list of organizations mapped in Activity C7 was used to identify and contact relevant experts.
- Research prioritization: To ensure the inclusion of non-academic perspectives, we leveraged previous interactions with staff from city administrations involved in Activity C11(Delphi survey on practitioners'

knowledge needs for ambitious Urban Nature Plans), successfully inviting some of them to join the expert panel.	
Main success factors (detailed in Annex 6): • Effective engagement through existing networks. • Diverse and multi-stakeholder composition of the expert group. • Ensuring synergies with other projects/initiatives and avoiding duplication. • Ensuring the answering process and outputs strengthen the NBS network and its resources. • Need for early planning of dissemination activities.	**Main challenging factors (detailed in Annex 6):** • Limited engagement from Horizon Europe project coordinators that were contacted to take part in the expert panel. • Lack of accessible contact information for Horizon Europe project coordinators. • Limited proactivity of Co-chairs of the expert panel in leading scientific coordination at early stages. • Long-term sustainability of the focal points' roles.

Request N.10: Providing a practical guide for local implementation of green roofs and walls: lessons from European experiences. **Timeline: April 4th -November 30, 2025.**	
Main support function: Answering urgent requests	**WPs involved:** WP1, WP4 – Task Force of Answering Requests, and WP5 – T5.3 Task
Objective: This request addressed the DG ENV knowledge need on practical guidance for local authorities and urban planners aimed at implementing green roofs and walls. It contributes to the implementation of the NRR, specifically addressing Article 8, which promotes the adoption of building-integrated greenery systems. The goal is to develop a report that provides an overview of different green roof and wall types, highlighting their main structural features and suitability for various building contexts (e.g., residential vs. commercial, new builds vs. retrofitting). Attention will be given to their compatibility with solar panel systems. Real-world implementation examples from European cities will be included to illustrate critical aspects such as installation, maintenance, and governance challenges, economic viability, and environmental and social benefits. Performance across varying European climatic conditions will also be considered. Specifically, the report will address the following questions: • How are green roofs and walls currently integrated into buildings across European cities? • What environmental, social, and economic benefits (e.g., biodiversity enhancement, urban cooling, stormwater management, cost-effectiveness) do green roofs and walls provide under different European climatic conditions? • What implementation and governance challenges have municipal authorities, urban planners, and developers encountered, and how have these been successfully overcome?	
Method/approach: The DC used the same knowledge overview model described in the previous factsheet for Request N.7. A pre-submission meeting was held with the requester DG ENV and the participation of KCBD to confirm the interest in submitting a formal request around green roofs and green walls implementation, clarify its scope and objectives, and agree on a timeline. Upon formal reception of the ticket from the KCBD on April 4, 2025, three focal points from BioAgora were appointed to coordinate the answering process. One focal point represents the Urban NBS DC and two are from Syke, holding expertise on green roofs and walls. To set up the Expert Group, a screening of EU-funded projects was carried out from databases including CORDIS, NetworkNature+, LIFE programme, and projects funded under the European Urban Initiative and Urban Innovation Actions. An Expert Group was formed with 13 experts representing academia, local authorities and municipalities, and the industry sector. At the time of submitting this deliverable, the Expert Group is preparing for the official kick-off meeting with the Requester.	
Linkages with other support functions:	

To be defined upon answering process's results.	
Summary of results: To be integrated after deliverable submission once the answering process has ended in November 2025.	
Success factors: To be defined upon answering process's results.	**Challenging factors:** To be defined upon answering process's results.

3.4. Marine DC

Request N.2: Cumulative Impacts of Offshore Wind Farm Expansions: Consequences & Solutions for achieving the GES across European marine waters **Timeline: February 2024 -July 30, 2025.**	
Main support function: Answering in depth requests	**WPs involved:** WP1, WP4 – Task Force of Answering Requests
Objective: The aim of the request is to examine the multi-level impacts of the planned expansion of wind energy production at sea, including cumulative impacts on marine ecosystems and on the achievement of good environmental status (GES). Such analysis is critically needed considering the increase in challenging targets for renewable energy sources that need to be achieved by Member States in the coming years, a large percentage of which are likely to be offshore. Existing studies on cohabitation between offshore wind energy production and nature tend to focus, in particular, on marine protected areas (MPAs) or the protection of species (e.g. birds). Existing knowledge misses an analysis relevant to all the dimensions (descriptors) of good environmental status as per the Marine Strategy Framework Directive (MSFD). Such analysis, which includes literature reviews and scenarios modeling, should look at how offshore wind energy expansion might affect the achievement of GES, considering the GES threshold values set by Member States for a number of GES criteria (such as seabed loss, impulsive noise, contaminant levels, species abundance, etc.) and the subsequent cumulative impacts. The study should empower the Commission to propose solutions, including in the context of the Member States' MSFD Programmes of Measures and the MSFD review, to make sure that offshore wind energy expansion does not impede the achievement of GES under the MSFD, considering the entire lifecycle of offshore wind power plants (including their decommissioning), whatever the type of turbine (monopiles, floating, tripods, etc.). These solutions could, for example, relate to marine spatial planning (e.g. current developments in the context of the Greater North Sea Initiative), in particular considering the cumulative impacts of other human activities on the marine environment.	
Method/approach: In this request we used a two-staged methods process, with a REA undertaken in the first 4-6 months to assess the scientific literature on both impacts and policy interventions. The results of which are then used to structure an online participatory workshop. In order to maximize the time and expertise on the two stages, we build an EWG with expertise in both knowledge synthesis and participatory methods together with knowledge of marine biodiversity and planning. This allows two separate working groups within the EWG to maximize their time on the different methods. recruit two expert working groups. The REA process started pre-summer (June-August) with the participatory workshop in spring 2025 In order to minimize the risk of duplication and to capture emerging research work in this area, which has been exposed in the call for knowledge, we recruit members of such research teams to be actively involved in the workshop event.	
Linkages with other support functions: Feedback into Policy Frameworks	
Summary of results: To be integrated after deliverable submission once the answering process has ended in July 2025.	
Success factors: To be defined upon answering process's results.	**Challenging factors:** To be defined upon answering process's results.

Request N.3: Cumulative Impacts of Offshore Wind Farm Expansions: Consequences & Solutions for achieving the GES across European marine waters **Timeline: February 2024 -July 30, 2025.**	
Main support function: Answering in depth requests	**WPs involved:** WP1, WP4 – Task Force of Answering Requests
Objective: The Birds and Habitats Directives (BHD) require designation and effective management of Natura 2000 sites (special protection areas -SPAs under the Birds Directive and special areas of conservation -SACs under the Habitats Directive) as the main contribution to reaching and maintaining the favourable conservation status of protected habitats and species. Member States must establish site-specific conservation objectives for species and habitats protected in the sites, as well as establish and implement the necessary conservation measures to reach those objectives. The site-specific conservation objectives should be based on scientific assessments that consider the ecological needs of species and habitats, their current status and threats. Clear measurable targets should be defined to guide targeted conservation actions. Despite existing guidance provided by the Commission on setting site-specific conservation objectives, they are still widely lacking in particular for marine habitats and species. This indicates the difficulty faced by Member States to formulate the objectives which adequately reflect the ecological requirements of the species, their current status and potential threats. The request relates to many existing initiatives, including the EU Biodiversity strategy for 2030. The issue is also relevant for discussions about the implementation of the Birds and Habitats Directives within Commissions expert (sub)- groups such as the Nature Directives Expert Group (NADEG) and the Marine Expert Group (MEG).	
Method/approach: In this request we used a two-staged methods process, with a REA undertaken in the first 4-6 months to assess the scientific literature on both impacts and policy interventions. The results of which are then used to support a Member State Workshop organized by DG ENV.	
Linkages with other support functions: • Feedback into Policy Frameworks (Nature restoration regulation)	
Summary of results: To be integrated after deliverable submission once the answering process has ended in December 2025.	
Success factors: To be defined upon answering process's results.	**Challenging factors:** To be defined upon answering process's results.

Request N.4: Identifying Gaps in Mapping of Marine Habitats across European Seas in support of the Implementation of the NRL. **Timeline: September 2024 -December 30, 2025.**	
Main support function: Answering in-depth requests	**WPs involved:** WP1, WP4 – Task Force of Answering Requests
Objective: This request is aimed at obtaining an overview or estimate of the extent of unmapped marine habitats listed in Annex II of the NRL. This overview will facilitate the implementation of the NRL in the marine environment, including estimation of financing needs. Attempts to map marine habitats have been ongoing under the Marine Strategy Framework Directive (MSFD), Habitats Directive (HD) including through support of dedicated projects co-financed by the EU (Horizon, LIFE). However, there is currently no overview of which Annex II marine habitats are mapped and to which extent, and which ones are not. This request will be handled in close collaboration with EmodNET, an initiative by the European Union aimed at collecting, harmonizing, and providing access to marine data from various sources across Europe. Its primary goal is to	

facilitate the sustainable use of marine resources, support marine research, and help achieve environmental policy goals.

By obtaining an overview of currently unmapped Annex II marine habitats, the request will directly contribute to closing the knowledge gaps and to the future restoration efforts. This information will guide member states in mapping these areas, enabling them to fulfil their legal obligations to restore marine biodiversity.

The European Marine Board has emphasized the need for accurate and extensive marine habitat maps to support various marine policies, including the EU Marine Strategy Framework Directive and the European Green Deal. Their Future Science Brief No. 11 on 'Marine habitat mapping' underscores the critical need for such maps.

Addressing the gaps in mapping Europe's marine habitats is crucial for effective conservation and sustainable management of these vital ecosystems.

Method/approach:
In this request we used a two-staged methods process, with a REA undertaken in the first 4-6 months to assess the scientific literature on both impacts and policy interventions. The results of which are then used to support a Member State Workshop organized by DG ENV.

Linkages with other support functions:

- Feedback into Policy Frameworks (Nature restoration regulation)

Summary of results: To be integrated after deliverable submission once the answering process has ended in December 2025.

Success factors: To be defined upon answering process's results.	**Challenging factors:** To be defined upon answering process's results.

4. Supporting active thematic networks

The thematic networks developed across the Pollination, Freshwater, and Urban NBS DCs collectively represent a diverse and dynamic knowledge ecosystem. Through mapping and engagement activities, these DCs brought together 157 organizations and networks (Annex 1) spanning science, policy, society, and business domains. These actors operate at various governance levels—local, national, EU, and global—and reflect both established institutions and emerging initiatives. They included EU institutions (e.g., DG Environment, Joint Research Centre), academic partners (e.g., Wageningen University, Swedish University of Agricultural Sciences), and international networks (e.g., International Union for Conservation of Nature, ICLEI – Local Governments for Sustainability).

In parallel, 57 EU-funded projects (Annex 2) were closely integrated into the DCs' networks, many of which actively contributed across multiple DC activities. These collaborations allowed DCs to build on existing outputs, reduce duplication, and enhance visibility and policy relevance.

The interactions facilitated by BioAgora laid the groundwork for more strategic and durable actor networks—namely, the future Knowledge Exchange Networks (KENs). These networks will support the long-term functioning of the SSBD by enabling collaboration across disciplines, sectors, and governance levels.

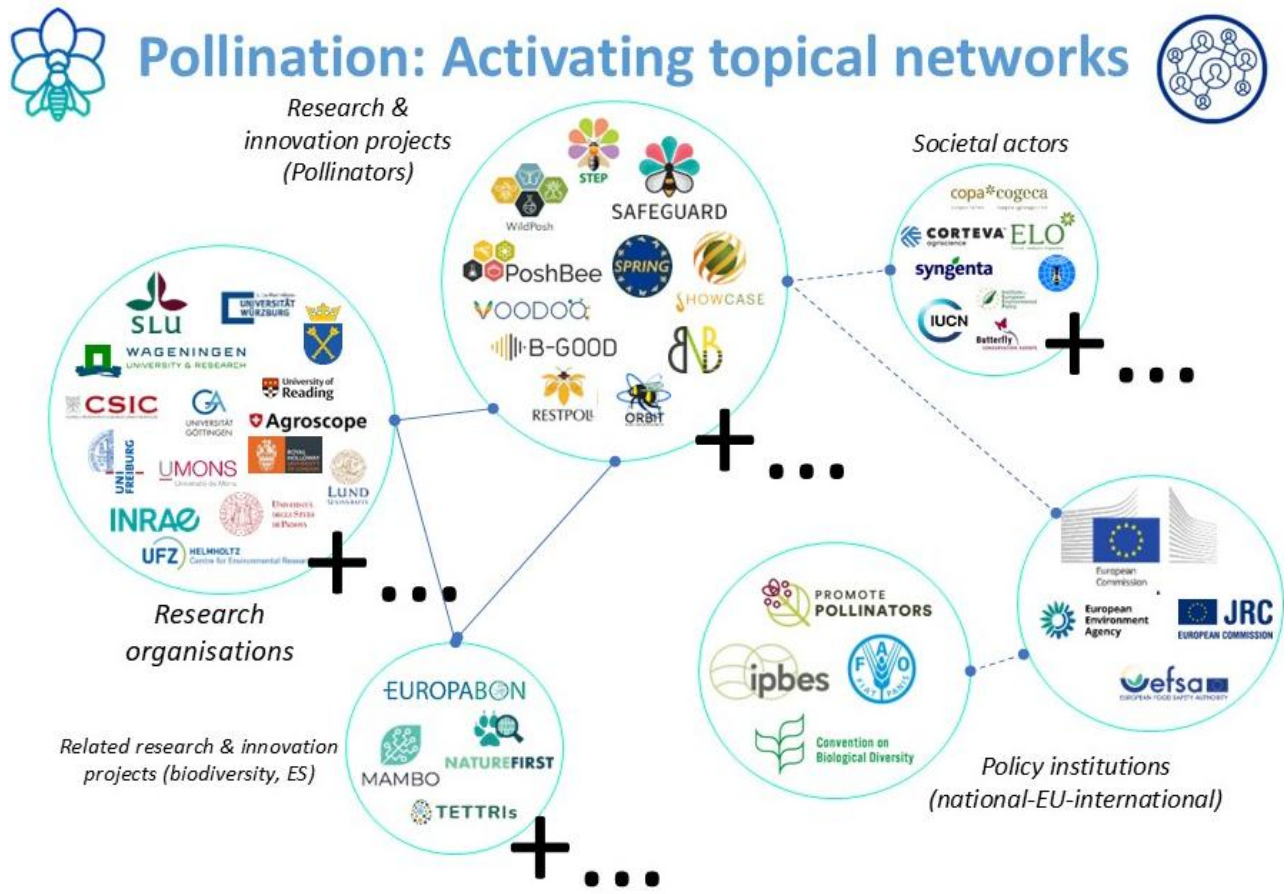
The subsequent Sections 4.1 – 4.3 provide a detailed account of the activities carried out by the DCs to support active thematic networks, including:

- Activity A4 (Pollination DC)
- Activities B2 to B7 (Freshwater DC)
- Activities C4 to C10 (Urban NBS DC)

4.1. Pollination DC

Activity A4: Mobilizing scientists and stakeholders in various events or workshops for Activities A1-3.	
Main support function: Activating topical network	**WPs involved:** WP1
Objective: Building on the existing pollinator research and stakeholder community to create an awareness in that community that BioAgora's pollination network can provide a direct Science-Policy Interface (SPI) facilitating knowledge exchange with EC policymakers. Through activities (e.g., Activity A1), provide an opportunity for more research organisations and stakeholders to engage and build a more inclusive SPI community	
Method/approach: The pollination DC benefited from an already large community of research organisations and stakeholders (Figure 3) with an interest in the topic some of whom were already very active in science-policy interface work. Therefore, there was already a willing scientific and stakeholder community present and ready to work on answering requests from policy. BioAgora offered the chance to expand that network and provide a unifying framework for science-policy interchanges for Horizon Europe and other projects to engage with EC policy. The pollination demonstration case network accordingly was mobilised through concrete activities that directly and proactively supported policy needs (Activity 1-2 in section 3 above) or responded to an urgent request from the DG Env (Request N9 in section 3 above) to assist with a programme of work.	

Figure 3: Key organizations and stakeholders of the Pollination DC network



Linkages with other support functions:

- Linking up with biodiversity policies and strategies

Summary of results:

Examples of supporting activation of the pollination network relating to activities addressing EC policy needs are:

1. Co-development (BioAgora, DG Env, University of Reading) of an **online scoping workshop** in June 2023 (titled POLLINATOR DECLINE AND THE EU POLLINATOR INITIATIVE –EUPI). 23 scientific and policy experts representing different European-funded projects assembled and workshopped two declared policy needs of the EU Pollinators Initiative (BD2030) and the EUBP WGP: 1) to identifying and improving Key Pollinator Areas (KPA) in the European landscape and their connectivity (buzzing lines); 2) to develop an Integrated Assessment Framework (IAF) for monitoring of pollinator biodiversity and linked causes and consequences of decline.
2. **Activity 1:** Mobilisation of 42 scientific experts from 15 countries & 25 research organisations to carry out the Delphi-type expert (2024) knowledge synthesis of the evidence using the DPSIR framework for wild pollinators. This informs the Priority 2 policy need of EU PI/EUBP WGP to construct an IAF for wild pollinators (Activity 1). Presentations of Activity A1 followed to EUBP WGP (June 2024) and a workshop during a session of 22nd European Week of Regions and Cities conference Brussels (October 2024).
3. **Activity 2:** A science-policy 'Buzzing table' workshop '*Gaming policies for a pollinator-friendly landscape*' (16/12/2024, Brussels) jointly organised by BioAgora and the H2020 Safeguard project. It involved 14 participating stakeholders from policy, NGOs, research organisations. This activity was designed to link the stakeholder part of the topical network through an evaluation of the acceptability of policies for pollinator conservation to the expert elicitation in Activity 1. A report (2025) was sent to policy (DG ENV, DG AGRI) and non-policy (IEEP, IUCN, ELO, Promote Pollinators etc) participants and a follow-up workshop is planned (jointly with H2020 Safeguard) inviting stakeholders to participate in a new more in-depth event.
4. **Request N.9:** Following a new (2025) urgent request (KCBD Ticket 29), the Pollination DC is mobilizing participants and projects in the pollinator topical network who can provide access to relevant scientific expertise that can support ongoing work by EEA/ETC-BE on the identification and eventual mapping of Key Pollinator Areas (KPAs) and their connectivity (buzzing lines).

Success factors (detailed in Annex 6): • Mobilisation of a network of voluntary experts to support activities. • Targeted individual invitations explaining the scope of BioAgora and activities, objectives and proposing outputs beneficial to their participation. • Offer incentives (e.g. joint paper/policy impact production) to leverage and value their participation.	**Challenging factors (detailed in Annex 6):** • Time constraints of scientists, policy experts and other stakeholders make longer >1-day events increasingly difficult to produce and require investment in effort to make happen. • Participant no shows on the day (e.g. illness, business need). • Skepticism and fatigue among scientists and stakeholders generally.

4.2. Freshwater DC

The activities presented in this section have been selected to illustrate how the Freshwater ecosystems DC tests and refines each of the core functions envisioned for a future SSBD for Biodiversity (SSBD), all through the lens of restoring free-flowing rivers across Europe. River connectivity embodies a complicated problem: it requires not only ecological and hydrological science, but also legal coherence, sustained stakeholder engagement, adaptive governance and a pan-European network of practitioners. Accordingly, our range of activities spans detailed comparative policy analyses (to harmonise the Nature Restoration Law with existing EU Directives), large-scale stakeholder mapping and network activation (building the European Rivers Cluster), co-production of targeted guidance (on barrier removal and adaptive management) and the generation of robust, spatially explicit evidence (through connectivity metrics and migratory fish prioritisation). Each activity both stands alone—delivering tangible outputs such as opinion papers, workshops, survey syntheses and scientific manuscripts—and interlocks with the others, knitting together legal, scientific and practical perspectives. By linking policy review, research prioritisation, capacity-building and evidence-generation, the Freshwater DC demonstrates how a truly integrated SSBD can help guiding diverse expertise and stakeholders into a coherent, action-oriented framework. In doing so, it offers a replicable blueprint not only for river restoration, but for any biodiversity challenge demanding rapid translation from science into policy and practice.

Activity B2: Developing an opinion paper on free-flowing rivers in the NRL	
Main support function: Linking up with biodiversity policy and strategies	**WPs involved:** WP1
Objective: To evaluate how the Nature Restoration Law's target of restoring 25 000 km of free-flowing rivers by 2030 aligns with, or diverges from, the Habitats Directive and Water Framework Directive and distill these insights into precise, actionable recommendations that enhance legal coherence, monitoring, and stakeholder engagement for Member State implementation.	
Method/approach: We began by conducting a detailed, article-by-article comparison of the Nature Restoration Law against the Habitats Directive and Water Framework Directive, pinpointing where definitions, targets and reporting requirements diverged or overlapped. Next, we convened a two-day expert workshop with river (restoration) experts in our network from all over Europe to unpack the legal, ecological and governance challenges; discussions were organized around seven core themes and captured in real time. Drawing on those workshop insights, we drafted a structured manuscript that paired each challenge with clear, actionable recommendations; successive versions were shared with participants and experts for iterative feedback and refinement. Finally, we developed a targeted dissemination plan, spanning conference presentations, policy briefs and a webinar, to ensure our findings feed directly into national restoration planning.	
Linkages with other support functions: • Activating topical networks: Our workshop brought together a large group of experts in river restoration to putting theory into practice. This generated a new working group, especially around practical policy implementation for free-flowing rivers.	

- Capacity building and governance of topical networks: The back-and-forth drafting of the opinion paper, with feedback from workshop participants and other stakeholders, doubled as a hands-on training in co-producing policy-relevant science. This collaborative process has fed into Task 2.3's emerging guidance on network governance, boosting our model for inclusive, transparent collaboration.

Summary of results:
Across Europe, over one million barriers have fragmented rivers for centuries, degrading hydromorphological dynamics and impairing ecological resilience; climate change further exacerbates warming, flow intermittency, pollution and invasive species pressures. Our analysis distilled seven interlinked challenges to meeting the NRL's 25 000 km free-flowing rivers target, ranging from inconsistent definitions and the need for meta-ecosystem thinking, to gaps in stakeholder engagement, legislative conflicts and integrated monitoring (see appendices). We show that translating research into practice is hindered by scale complexity, overlapping legal frameworks, multi-level governance hurdles and limited adaptive tools. Our recommendations call for harmonized terminology, large-scale connectivity planning, participatory governance mechanisms, targeted capacity building, and specialized assessment and reporting protocols to ensure effective implementation of the Nature Restoration Law.

Figure 4: Seven challenges for effective implementation of the European Nature Restoration Law that targets establishing an additional 25,000 km of free-flowing rivers by 2030. NB: The seven challenges are interconnected, and the order does not imply a linear approach. All challenges must be addressed concurrently in order to achieve the overarching goal of restoring free-flowing rivers (Stoffers et al., 2024).

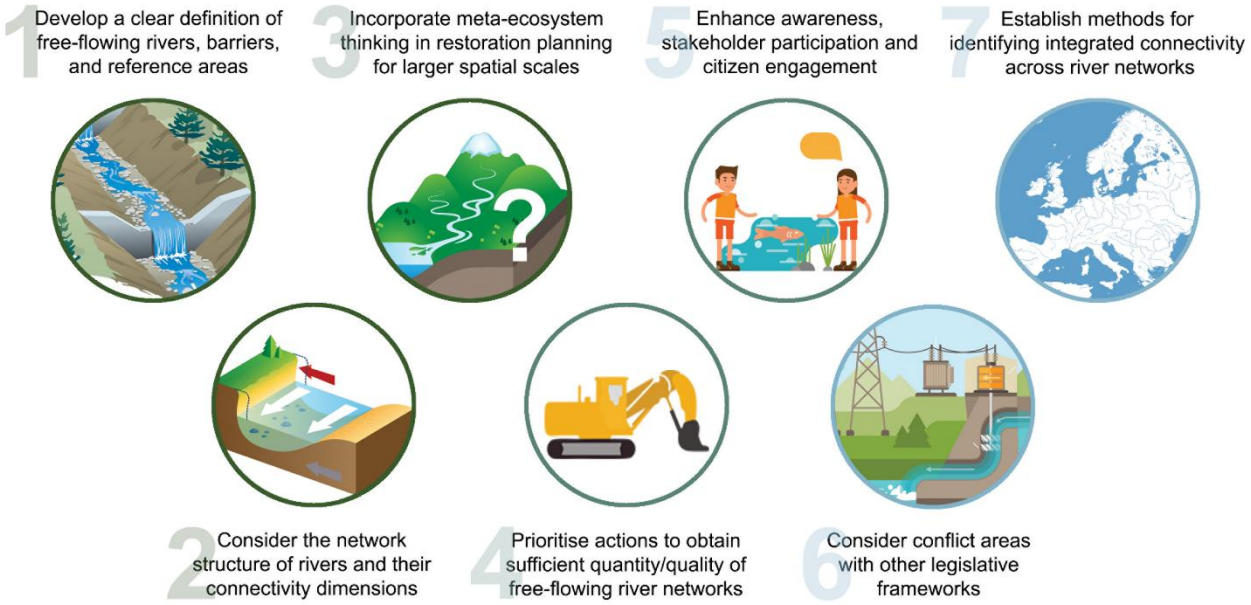


Table 3: Seven challenges for the achievement of the BDS2030 goal of creating an additional 25,000 km of free-flowing rivers by 2030 (Stoffers et al., 2024)

Nr	Challenge	Details
1	Develop a clear definition of free-flowing rivers, barriers, and reference areas	A fundamental challenge lies in creating precise and workable definitions for free-flowing rivers, barriers, and reference areas. This requires a conceptual framework that harmonizes various definitions to create a unified basis.
2	Consider the network structure of rivers and their connectivity dimensions	Recognizing the complex network structure of rivers and understanding their intricate 4-dimensional connectivity dimensions is crucial. Effective restoration demands a holistic approach to grasp how different parts of rivers interact.
3	Incorporate meta-ecosystem thinking in restoration planning	Incorporating meta-ecosystem thinking in restoration planning requires how ecosystems are interconnected.

4	Prioritise actions to maximize quantity and quality of free-flowing river networks	Balancing the amount and quality of restored free-flowing rivers presents a complex challenge. Efficient strategies are needed to prioritize actions and allocate resources effectively.
5	Enhance awareness, stakeholder participation and citizen engagement	A significant challenge is to increase awareness and engage stakeholders and citizens actively. Building a shared understanding and garnering support are vital to sustaining momentum and collective efforts.
6	Consider conflict areas with other legislative frameworks	Navigating conflicts with existing laws and regulations is a considerable challenge. Harmonizing restoration goals with other legal mandates requires careful coordination and adaptability.
7	Establish methods for identifying integrated connectivity across river networks	Developing and implementing an integrated monitoring framework that combines established knowledge and tools, and integrates novel approaches is crucial. Techniques to assess how physical and ecological factors interact are necessary for making informed decisions.

Success factors (detailed in Annex 6):

- Collaborating with a group of well-known river-restoration scientists meant our recommendations carried real authority and reflected the latest insights in the field.
- Clear roles, tight deadlines, and agile coordination let us turn workshop insights into policy-ready guidance in time to shape the NRL's final text.
- Every author helped share our findings (e.g., through conference talks, policy reports, news articles, and local stakeholder briefings) so our work reached both EU-level policymakers and on-the-ground practitioners.

Challenging factors (detailed in Annex 6):

- Complex overlaps between the NRL, Habitats Directive and WFD made it hard to untangle legal language and ensure recommendations were fully coherent.
- Balancing the varied priorities of conservationists, river managers, policymakers and local stakeholders required careful mediation to reach consensus.
- Translating technical, science-heavy findings into clear, policy-friendly language was challenging without oversimplifying key nuances.

References:

Stoffers, T., Altermatt, F., Baldan, D., Bilous, O., Borgwardt, F., Buijse, A. D., ... & Hein, T. (2024). Reviving Europe's rivers: Seven challenges in the implementation of the Nature Restoration Law to restore free-flowing rivers. *Wiley Interdisciplinary Reviews: Water*, *11*(3), e1717. https://doi.org/10.1002/wat2.1717

Activity B3: Developing a stakeholder-informed policy brief on barrier removal for NRP under the NRL.

Main support function: Linking up with biodiversity policy and strategies

WPs involved: WP1

Objective:

To produce a detailed briefing that uses the framework of Article 9 of the Nature Restoration Law to translate legal obligations into clear, example-driven barrier-removal actions for Annex I freshwater habitats. The goal is to equip Member States and on-the-ground practitioners with a practical guide, structured around Article 9's mapping, prioritisation, implementation and maintenance duties, that they can plug directly into their (draft) National Restoration Plans.

Method/approach:

We began by aligning our briefing directly with the five key duties of Article 9, which are (1) mapping barriers, (2) prioritizing obsolete structures, (3) restoring longitudinal, lateral and vertical connectivity, (4) pairing removals with floodplain and wetland measures, and (5) securing long-term connectivity. After an initial planning call with Wetlands International, Living Rivers Europe, and ClientEarth, We collectively drafted a template that turned each Article 9 clause into a clear section heading. We then gathered real-world case studies from stakeholders and research papers that showcased barrier removal's multiple benefits (e.g., re-establishing river continuity, improving water quality, enabling fish passage, bolstering flood and drought resilience, and even rewetting peatlands). Those examples were woven into concise, actionable guidance under each heading, with sidebars noting cross-references to the Water Framework and Habitats Directives. Successive drafts were shared in rapid-feedback rounds with the NGOs, DG ENV advisers and scientists from IGB, allowing us to refine language, tighten legal accuracy and ensure practical relevance. The final

briefing was formatted to DG ENV's specifications and will be soon (Spring 2025) uploaded directly into the National Restoration Plan drafting platform.

Linkages with other support functions:

- Linking up with biodiversity policy and strategies: We built directly on our earlier comparative review of the NRL, Habitats Directive and WFD (Activity N.2), using those legal insights to ensure each Article 9 section in the briefing was accurately framed and coherent with existing EU biodiversity strategies.
- Activating topical networks: By tapping into the stakeholder roster compiled under T2.1, we brought together the right mix of river-restoration scientists, NGOs and policy advisors to contribute case studies and rapidly peer-review each draft.
- Capacity building and governance of topical networks.

Summary of results:

Barrier removal emerges as a targeted, cost-effective measure that can unlock multiple ecological benefits across a wide range of Annex I habitats of the Water Framework Directive (freshwater, wetland and peatland) when hydrological, sedimentary or disturbance regimes are disrupted by artificial structures. Our policy briefing illustrates this with three spotlight examples:

- *Water courses of plain to montane levels (Habitat 3260)*: In "Water courses of plain to montane levels with Ranunculion fluitantis and Callitricho-Batrachion vegetation," barrier removal restores longitudinal connectivity needed for natural flows, sediment transport and fish migration, while also re-establishing lateral floodplain exchange and vertical groundwater interactions.
- *Coastal lagoons (Habitat 1150)*: Here, removing barriers re-balances salinity by reopening freshwater inflows and outflows, stabilizes surface–groundwater exchanges that regulate water levels and nutrient cycling, and reverses eutrophication and biodiversity loss caused by hypersalinity.
- *Peatlands (Habitat 7110)*: For Active raised bogs, dismantling embankments and drainage structures re-establishes vertical connectivity to maintain a high, stable water table and temporal connectivity for seasonal fluctuations, critical for peat formation and habitat integrity.

We further emphasize that barrier removal is equally relevant to *Alpine rivers* (3220), *transition mires and quaking bogs* (7140), *bog woodlands* (91D0), *hydrophilous tall-herb fringes* (6430) and *natural eutrophic lakes* (3150). By integrating these case-by-case examples into the framework of Article 9's five obligations, the briefing provides Member States with a clear, habitat-specific roadmap for mapping, prioritizing, implementing and maintaining barrier-removal measures. Endorsed by Living Rivers Europe and ClientEarth, and planned to be featured in a webinar in which DG Env representatives would participate, our guidance is communicated with a wide range of stakeholders and practitioners.

Success factors (detailed in Annex 6):

- Using targeted case studies for freshwater, coastal and peatland Annex I habitats made the briefing directly actionable across varied ecosystem contexts
- Framing every section around Article 9's five duties yielded a clear, step-by-step roadmap that policymakers could follow with confidence.
- Ongoing co-drafting with NGOs (Wetlands International, Living Rivers), IGB scientists and DG ENV advisors ensured the guidance was both legally sound and practically relevant.

Challenging factors (detailed in Annex 6):

- Condensing complex hydrological and ecological concepts into focused, policy-ready guidance demanded repeated edits to maintain accuracy without overloading non-technical readers.

Activity B4: Mapping and activating a European Rivers Cluster to coordinate EU freshwater biodiversity and restoration projects.

Main support function: Activating topical networks

WPs involved: T2.1, T2.3, and T4.1 Tasks

Objective:

To chart the landscape of EU-funded freshwater biodiversity and river restoration projects by compiling detailed records, capturing each project's objectives, target legislative framework, habitat/species focus, and when available contact points. Then select the most relevant initiatives for the restoration of free-flowing rivers into a European Rivers Cluster where partners align data collection, priorities, share best practice and coordinate restoration action.

Method/approach:

We assembled a "master database" of freshwater biodiversity and river restoration projects (under LIFE and Horizon (2020) funding) using the TIM tool, web searches and past deliverables, recording for each: programme type, project ID,

acronym, title, objectives, website, relevant EU legislation, target habitats and species. We then identified the most directly relevant projects to invite into our European Rivers Cluster. We set up an online workspace and convened quarterly hybrid meetings, structuring sessions around shared challenges surfaced from the database.

Linkages with other support functions:

- Linking up with biodiversity policy and strategies: By tagging every project in the database with its relevant EU legislation (Nature Restoration Law, Habitats Directive, Water Framework Directive, etc.) and target habitats/species, we ensured the cluster's membership is tightly aligned with key policy frameworks and biodiversity targets.
- Capacity building and governance of topical networks: Bringing together representatives from flagship projects the cluster co-developed its own ways of working together and practised co-production of knowledge.

Summary of results:

Over three months, we compiled and maintain a dynamic registry of more than 380 freshwater-focused EU projects. From this pool, we selected the most relevant initiatives for the restoration of free-flowing rivers into a European Rivers Cluster, currently comprising representatives of eight flagship projects: SOS-Water, Danube4All, AquaINFRA, NaturaConnect, Restore4Life, BioAgora, EcoAdvance and Danube Lifelines. The Cluster has held three meetings to draft joint policy briefs and co-author two publications, and is recognised by DG ENV as the primary consultative forum on river-connectivity.

Success factors (detailed in Annex 6):	**Challenging factors (detailed in Annex 6):**
• Capturing comprehensive project metadata (legislation, habitats, species) enabled precise stakeholder targeting and detailed search strategies • Hybrid meeting formats with interested projects translated static data into ongoing, dynamic collaboration.	• Harmonising diverse project descriptions into consistent database fields required extensive verification. • Securing up-to-date contact details and legislation references added administrative overhead.

Annex: The list of mapped projects relevant to the Freshwater DC is provided in the Annex 2.

Activity B5: Organising thematic workshops and special sessions to strengthen networks on free-flowing river policy implementation

Main support function: Activating topical networks	WPs involved: T3.3, T2.1, and T2.3 Tasks

Objective:

To root the Freshwater DC firmly within Europe's river-restoration community by drawing together scientists, NGOs, policy-makers and practitioners into established EU-level networks focused on the Nature Restoration Law's free-flowing rivers commitments. Building on our comprehensive database of over 380 freshwater-biodiversity projects, personal connections, and the newly established European Rivers Cluster, we set out to bring together scientists, NGOs, policy-makers and practitioners in targeted workshops and advisory sessions. The aim was to sustain policy-relevant dialogue around the Nature Restoration Law's free-flowing rivers targets, uncover practical challenges and co-create solutions that Member States can plug directly into their National Restoration Plans.

Method/approach:

We leveraged our live registry of 380+ EU projects, compiled via the TIM tool, web searches and past deliverables—and validated through one-to-one interviews. Building on that, we convened cluster members and key contacts in five thematic workshops (Alpine Rivers, SERE, Free Flow, EURO-INBO, BioClim) and special sessions at SIL and Naturmål Copenhagen. Each event wove together expert presentations, breakout discussions and live polling to explore the three priority gaps identified earlier (barrier-inventory data, governance, training). In parallel, we served on advisory panels at flagship conferences and distilled session outcomes into two policy briefs and three co-authored publications, sharing them via conferences and digital channels to strengthen the pan-European "network of networks".

Linkages with other support functions:

- Linking up with biodiversity policy and strategies: workshop agendas and discussion materials drew directly on our prior policy reviews of the NRL, Habitats Directive and Water Framework Directive, ensuring that network conversations stayed focused on the most pressing legislative gaps and biodiversity targets (e.g. BDS2030's free-flowing rivers goal). This kept the topical network tightly anchored to EU biodiversity strategies and smoothed the pathway for our outputs to influence National Restoration Plans.

- Capacity building and governance of topical networks: we applied the co-production and governance principles co-developed in T2.3 (e.g., such as transparent decision-making, role clarity and shared ownership) to every event format, turning each workshop into both a knowledge-exchange platform and a hands-on training ground. This not only strengthened participants' skills in stakeholder facilitation and collaborative policy design but also laid the groundwork for the European Rivers Cluster's ongoing self-governance.

Summary of results:
The Freshwater DC began by creating and continually updating a living directory of over 150 river-restoration experts from 40 European organisations. Through one-to-one interviews and five jointly hosted workshops, we identified three priority needs: standardised barrier-inventory data, stronger cross-sector governance arrangements and more focused practitioner training. Drawing on these findings, we set up the European Rivers Cluster, which now meets quarterly (both online and in person) to develop share restoration strategies. Our advisory roles and presentations at BioClim, EURO-INBO, Free Flow, SERE and Alpine Rivers engaged more than 200 stakeholders, directly informing two policy briefings and three collaborative publications. By sharing these outputs widely (at conferences, in news articles and via local policy forums) we have woven the importance of barrier removal and river connectivity into EU restoration discussions, turning a loose collection of initiatives into a cohesive "network of networks" poised to support Member States as they prepare their National Restoration Plans.

Success factors (detailed in Annex 6):
- Grounding each event in our NRL, Habitats Directive and Water Framework Directive analyses kept discussions tightly focused on real policy gaps and biodiversity targets.
- Incorporating interactive breakout sessions and live polling not only surfaced critical insights but also strengthened participants' facilitation and co-production skills.
- Serving on conference advisory panels created two-way knowledge exchange, boosting the visibility of free-flowing river priorities for the larger scientific community.

Challenging factors (detailed in Annex 6):
- Coordinating around numerous international conferences and busy stakeholder schedules sometimes led to lower-than-expected turnout at key workshops.
- Certain sectors, such as hydropower and infrastructure groups, but also DG ENV, were reluctant to engage, which limited the diversity of perspectives in our discussions.
- Organizing and facilitating frequent in-person and virtual events proved resource-intensive, straining our team's time and budget.
- Integrating disparate contact lists and varied stakeholder inputs into a single, up-to-date database required substantial effort to ensure accuracy and consistency.

Activity B6: Co-drafting a guidance embedding adaptive management principles into river restoration under the EU Nature Restoration Law

Main support function: Capacity building and governance of topical networks

WPs involved: WP3 - T3.3 Task

Objective:
To equip policymakers, researchers and practitioners with a practical, evidence-based framework for embedding adaptive-management cycles into (river) restoration practices under the Nature Restoration Law. It draws on stakeholder experience, scientific case studies and policy analysis so that Member States can design, implement and refine restoration actions with ongoing monitoring, feedback loops and flexible targets.

Method/approach:
Within our working group, we began by pulling together practical examples of adaptive management from the hub's (Biodiversa+) projects, focusing on both river and terrestrial restoration. We then convened a series of online and in-person working-group sessions bringing together ecologists, social-ecological scientists and on-the-ground practitioners. In each meeting, we explored real-world case studies, identified the hurdles to applying adaptive cycles under the Nature Restoration Law, and identified the tools and processes that have worked elsewhere. Using those insights, we drafted an opinion paper, circulating successive versions among Hub partners (river) restoration experts, and practitioners for feedback and refinement. We paid particular attention to crafting clear guidance on setting monitoring indicators, organising stakeholder review loops and embedding decision-points into restoration plans. Finally, we sketched out a dissemination timetable with the other working groups, aligned with EU policy milestones that will be presented at the SERE 2026 conference to ensure our guidance reaches policymakers, researchers and practitioners at the moments they need it most.

Linkages with other support functions:

- Linking up with biodiversity policy and strategies
- Activating topical networks

Summary of results:

The working group has now completed a near-final draft of the opinion paper "Mainstreaming Adaptive Management to Support the EU Nature Restoration Law". This work lays out a clear, step-by-step adaptive-management cycle specifically tailored to (river) restoration practices under the NRL, covering everything from setting restoration objectives and designing monitoring indicators to convening stakeholder feedback loops and embedding decision gates for iterative adjustment. Drawing on real-world case studies from both freshwater and peatland projects, it illustrates practical successes and common pitfalls in adaptive implementation. To ensure seamless alignment with EU legal instruments, the guidance includes tools that map adaptive phases onto key NRL requirements (such as Article 9 connectivity measures and reporting obligations). Finally, we are developing a strategic dissemination plan timed around EU policy milestones and the SERE 2026 conference, to ensure that policymakers, researchers and practitioners receive and apply these recommendations at the moments they are drafting and executing their National Restoration Plans.

Success factors (detailed in Annex 6):	**Challenging factors (detailed in Annex 6):**
• Involving policy experts, ecologists and practitioners ensured that guidance is robust and actionable. • Aligning every recommendation with NRL, WFD and Habitats Directive terminology facilitated direct uptake.	• Balancing methodological rigor with the practical constraints of on-the-ground practitioners required careful trade-offs. • Limited availability of standardised monitoring data hindered some recommendations.

Activity B7: Co-drafting and submiting a transformative opinion piece to Current Opinion in Environmental Sustainability, strengthening governance frameworks for thematic networks.

Main support function: Capacity building and governance of topical networks	**WPs involved:** WP2 task 2.3 and WP3 task 3.1

Objective:

To assess the transformative potential of the topical networks and to develop a SSBD supporting it. Analyze the experiences from the Freshwater DC networks, identify barriers for implementing the target of free-flowing rivers and link them to the framework for assessing actionable information on biodiversity. Implement the four PEPE principles: pluralizing, empowering, politicizing and embedding. The perspective for transformation was taken to review all functions of the SSDD in the Freshwater DC.

Method/approach:

In a series of eight online workshops, the theory of transformative change was developed for the transformative framework and results were adopted to the topical networks of the Freshwater DC. We assessed the root causes for barriers to implement the target of free-flowing rivers and linked them to the PEPE principles. For example, one of the root causes for the lack of member state reporting about obsolete barriers is, the lack of data about dams and weirs. The Amber project has thus made a big progress in developing a citizen-science based map, usable by all networks (pluralizing) in which data of barriers in rivers and other fluvial systems can be entered and which is accessible by the public (empowering). The mapping is used by the network of network for awareness raising (embedding) and assistance for the reporting on obsolete dams by the member states (politicizing).

Linkages with other support functions:

- Linking up with biodiversity policy and strategies, in empowering the network of network to implement the target of 25,000 km of free-flowing rivers.
- Activating topical networks, in providing the theoretical framework for transformative potential of the European River Cluster.

Main results:

For embedding the PEPE principles in the Freshwater DC the network of networks, the European Rivers Cluster, offers a platform for the structural governance of the Science-Policy-Society Interface (SPSI). The cluster can promote a clear division of responsibilities to the organizations involved, in order to move forward together. For example, in advocating the target of 25,000 km of free-flowing rivers, or lobbying for a constructive weighing up arguments for or against the construction of new hydropower plants (e.g. efficiency of energy production vs. fish mortality at fish passes). The cluster can bundle the voices of the networks for (1) empowering the arguments for biodiversity protection against the economic interest (e.g. selling concrete), (2) politicizing in providing knowledge about minimal requirements for efficiency of hydropower plants and the investment costs in fish passes, which effectively safe migratory species and (3) accessing

events with decision makers or groups with economic interests on river barriers, such as for example the Verbund. The cluster will connect members and networks across many boundaries, translate and transfer knowledge.	
Success factors (detailed in Annex 6): • Willingness of many networks to join forces with the European River Cluster (our network of networks). • Empowering the topical networks in providing knowledge about the politics of unsustainable and inequitable practices, and actors to take responsibility. Potential of a joint voice for the SPSI.	**Challenging factors (detailed in Annex 6):** • Breaking down and removing elements of the current system stands in opposition to the Renewable Energy Directive. Delivering arguments to lobbyist groups for the sustainable practice of hydropower plants and the actual investment costs for the installation of new plants if considering most efficient and modern fish passes. • Integrating perspectives from different subjects such as land planning, cultural heritage and climate change issues into the public debate for removing barriers in rivers.
References: https://power.verbund.com/de	

4.3. Urban NBS DC

The urban NBS DC carried out a set of interlinked activities to test and inform the SSBD's overarching function of creating and supporting active thematic networks. These activities were organised around three key support functions: (i) linking with biodiversity policies and strategies, (ii) activating topical networks, and (iii) strengthening capacity building and governance.

The first group of activities (Activities C4 and C5) focused on positioning the DC within the broader EU biodiversity policy landscape and defining its strategic focus. This included clarifying the scope and relevance of urban NBS as a demonstration topic and identifying key policy and implementation challenges.

The second group of activities (Activities C6 and C7) aimed to map the current landscape of actors and initiatives working on urban NBS. This involved identifying key organizations, networks, and EU-funded projects across different domains and governance levels—both within and beyond the NetworkNature+ framework, the main EU platform on NBS. This mapping helped uncover gaps, overlaps, and opportunities for improved coordination and knowledge sharing.

The third group of activities (Activities C8, C9 and C10) sought to enhance the transformative potential of the identified network. These focused on identifying capacity needs at the SPSIs and testing formats for interdisciplinary exchange and collaboration, with the aim of supporting more inclusive and reflexive governance models.

Together, this sequence of activities provided insights into how the SSBD can support the development of well-connected, policy-relevant thematic knowledge exchange network on urban NBS—anchored in existing knowledge, responsive to strategic needs, and capable of fostering collaboration across sectors and scales.

Activity C4: Conducting a non-systematic literature review on NBS implementation challenges in urban contexts	
Main support function: Linking up with biodiversity policy & strategies	**WPs involved:** WP1 - Task 1.1
Objective: This activity focused on conducting a targeted, non-systematic scientific literature review to identify the main challenges associated with implementing NBS in urban contexts, particularly in relation to the EU BDS 2030 target for greening urban and peri-urban areas. By mapping these challenges, the review contributes to an evidence base that highlights where targeted science-policy interventions are most urgently needed.	

Method/approach: This activity was conducted as part of BioAgora Deliverable D1.1, which employed a mixed-method research approach to identify and categorize the most pressing implementation challenges of the EU Biodiversity Strategy 2030. This DC contributed to this work by identifying examples of specific challenges related to Target 14 – Greening urban and peri-urban areas: Cities with at least 20,000 inhabitants have an ambitious Urban Greening Plan – based on both professional experience and knowledge on relevant literature. As part of Task T1.1, general categories of challenges were established through a review of existing literature and expert consultation, and these categories served as a framework for reporting challenges associated with the implementation of Target 14. The categories include: availability of knowledge; funding; horizontal policy coherence (e.g. between biodiversity policy and the CAP, forestry, urbanization, energy and climate, or trade policies); management effectiveness; vertical policy implementation; systematic spatial planning; engagement; and current political and economic structures.

Summary of results: The implementation of NBS in urban contexts—particularly within the framework of the EU Biodiversity Strategy 2030 and its target for Urban Greening Plans—faces a range of persistent and interrelated challenges. These challenges span the categories of knowledge availability, horizontal policy coherence, vertical policy implementation, funding, systematic spatial planning and engagement.

A key challenge is the limited availability of robust, context-sensitive evidence on NBS effectiveness, long-term performance, and multiple co-benefits. Unlike conventional grey infrastructure, the benefits of NBS are often harder to measure and standardize, which makes it difficult to build strong cost-benefit arguments (Raymond et al., 2017; Faivre et al., 2017; Dorst et al., 2022; Sarabi et al., 2020; Kabisch et al., 2016). This weak evidence base poses a barrier to their systematic inclusion in urban planning and investment decisions, as it limits the ability of planners, policymakers, and financial actors to assess their comparative value and reliability. These knowledge limitations are closely linked to a broader lack of technical capacity. Many urban planners and infrastructure professionals lack the interdisciplinary expertise required to design and implement NBS, particularly in relation to ecosystem functioning and socio-ecological systems (Faivre et al., 2017; Croeser et al., 2021; Sarabi et al., 2020). This issue is further exacerbated by the limited availability of training, technical guidelines, and knowledge brokers able to translate between science, practice, and policy (Dorst et al., 2022). In addition, the inherent complexity of NBS planning presents further difficulties. Cities often need to balance multiple, and at times competing, objectives while operating under spatial and financial constraints. Yet, appropriate decision-support tools to manage these trade-offs are either lacking or insufficiently integrated into existing planning processes (Croeser et al., 2021; Raymond et al., 2017).

At the governance level, NBS implementation in urban areas is significantly constrained by institutional fragmentation and a lack of horizontal policy coherence. Within municipal administrations, responsibilities for key policy areas such as biodiversity, climate adaptation, land use, public health, and infrastructure are typically divided across sectoral departments. This siloed governance structure hampers the integration of NBS into planning processes that require multifunctional and cross-sectoral coordination (Sarabi et al., 2020; Wilk et al., 2021, Hawxwell et al., 2020). Moreover, there is a lack of governance frameworks that support coordination across different levels of government (Davis et al., 2018). In many cases, responsibilities for planning and implementation are distributed in ways that are not well aligned between local, regional, and national authorities. For instance, national policies may set high-level goals for biodiversity or climate adaptation, but leave cities with limited guidance, resources, or legal obligations to implement them. At the same time, regional authorities may oversee ecological planning while local governments make land-use decisions that directly impact those areas, often without mechanisms for coordination. These mismatches between ecological needs and administrative competencies make it difficult to develop and implement cohesive NBS strategies (Schröter et al., 2022).
These governance structural limitations are reinforced by political and regulatory inertia. Urban greening is often deprioritized in favour of competing interests such as housing or transport infrastructure. In many cases, municipal governments operate without binding legal requirements or long-term policy commitments to biodiversity or ecosystem restoration, leaving NBS initiatives dependent on the discretionary will of local administrations (Xie & Bulkeley, 2020; Sarabi et al., 2020). Moreover, the widespread reliance on project-based experimentation, while valuable for innovation, tends to confine NBS to isolated pilot initiatives within already supportive environments. This limits their scalability and fails to produce the systemic shifts needed for long-term transformation (Schröter et al., 2022; Croeser et al., 2024).

Limited funding is a major barrier to the systematic implementation of NBS in urban areas. Many cities face budget constraints and lack access to financing instruments suited to the specific needs of NBS, particularly for long-term

maintenance and scaling (Toxopeus & Polzin, 2021; Dorst et al., 2022). Funding is often tied to short-term projects and does not support the sustained, cross-sectoral investment required for broader deployment. Public-private financing mechanisms are still underdeveloped, and private investors are often hesitant due to perceptions of risk and uncertain returns. Another challenge is how NBS are valued. Traditional cost-benefit analyses tend to overlook the full range of social, environmental, and health co-benefits—such as improved air quality, climate resilience, and social cohesion—which leads to an underestimation of their long-term value (Toxopeus & Polzin, 2021; Wilk et al., 2021). This limits both public investment and the emergence of innovative financing models, leaving cities without the financial tools needed to scale NBS effectively.

Spatial constraints and land-use competition are significant barriers to NBS implementation in dense urban areas. Limited land availability and pressure from other priorities—such as housing, transport, and commercial development—reduce opportunities for large-scale greening (Wilk et al., 2021; Dorst et al., 2022). Private green spaces like gardens, rooftops, and courtyards offer valuable potential for biodiversity and connectivity, yet they are often overlooked in planning and lack mechanisms for owner engagement (Wilk et al., 2021). Additionally, many local plans lack binding mandates to reserve land for green spaces, making NBS vulnerable to political shifts and short-term development goals (Xie & Bulkeley, 2020; Wilk et al., 2021). Persistent perceptions that NBS are less effective than grey infrastructure further marginalize them in planning decisions, reflecting deeper institutional and cultural biases (Faivre et al., 2017; Wilk et al., 2021).

Finally, stakeholder engagement in urban greening remains limited and uneven. Although inclusive co-creation processes are widely recognized for enhancing legitimacy, ownership, and the long-term success of NBS, they are rarely institutionalized in urban planning practice (Raymond et al., 2017; Kabisch et al., 2016; Wilk et al., 2021). Participatory approaches are often perceived as time-consuming, inefficient, or difficult to manage, particularly in politically or administratively constrained contexts.

Linkages with other support functions:
No direct link was found with other support functions.

Main success factors (detailed in Annex 6):

- Strategic contribution to policy alignment.
- Basis for Science-Policy Interface Development.
- Evolving into a Systemic Change Facilitator.
- Enhancing NBS strategic framing and communication.

Main challenging factors (detailed in Annex 6):

- Risk of over-reliance on project-based approaches.

References:

Croeser, Thami, Georgia Garrard, Roshan Sharma, Alessandro Ossola, and Sarah Bekessy. 2021. “Choosing the Right Nature-Based Solutions to Meet Diverse Urban Challenges.” Urban Forestry & Urban Greening 65: 127337. https://doi.org/10.1016/j.ufug.2021.127337.

Croeser, Thami, Sarah Clement, Marta Fernandez, Georgia E. Garrard, Ian Mell, and Sarah A. Bekessy. 2024. “Action Research for Transformative Change.” Sustainability Science 19 (2): 665–70. https://doi.org/10.1007/s11625-023-01458-2.

Davis, McKenna, Katrina Abhold, Linda Mederake, and Doris Knoblauch. 2018. “Nature-Based Solutions in European and National Policy Frameworks.” https://naturvation.eu/result/nature-based-solutions-european-and-national-policy-frameworks.

Dorst, Hade, Alexander van der Jagt, Helen Toxopeus, Laura Tozer, Rob Raven, and Hens Runhaar. 2022. “What’s behind the Barriers? Uncovering Structural Conditions Working against Urban Nature-Based Solutions.” Landscape and Urban Planning 220: 104335. https://doi.org/10.1016/j.landurbplan.2021.104335.

Faivre, Nicolas, Marco Fritz, Tiago Freitas, Birgit de Boissezon, and Sofie Vandewoestijne. 2017. “Nature-Based Solutions in the EU: Innovating with Nature to Address Social, Economic and Environmental Challenges.” Environmental Research 159 (August): 509–18. https://doi.org/10.1016/j.envres.2017.08.032.

Hawxwell, Tom, Sophie Mok, Ernesta Mačiulytė, Johannes Sautter, and Ekaterina Dobrokhotova. 2019. “Municipal Governance for Nature-Based Solutions: Executive Summary of the UNALAB Municipal Governance Guidelines.”

Kabisch, Nadja, Niki Frantzeskaki, Stephan Pauleit, Sandra Naumann, McKenna Davis, Martina Artmann, Dagmar Haase, et al. 2016. “Nature-Based Solutions to Climate Change Mitigation and Adaptation in Urban Areas: Perspectives

on Indicators, Knowledge Gaps, Barriers and Opportunities for Action." Ecology and Society 21 (2). https://doi.org/10.5751/ES-08373-210239.
Raymond, Christopher M., Niki Frantzeskaki, Nadja Kabisch, Pam Berry, Margaretha Breil, Mihai Razvan Nita, Davide Geneletti, and Carlo Calfapietra. 2017. "A Framework for Assessing and Implementing the Co-Benefits of Nature-Based Solutions in Urban Areas." Environmental Science and Policy 77: 15–24. https://doi.org/10.1016/j.envsci.2017.07.008.
Sarabi, Shahryar, Qi Han, Bauke de Vries, and A. Georges L. Romme. 2022. "The Nature-Based Solutions Planning Support System: A Playground for Site and Solution Prioritization." Sustainable Cities and Society 78: 103608. https://doi.org/10.1016/j.scs.2021.103608.
Schröter, Barbara, Jochen Hack, Frank Hüesker, Christian Kuhlicke, and Christian Albert. 2022. "Beyond Demonstrators—Tackling Fundamental Problems in Amplifying Nature-Based Solutions for the Post-COVID-19 World." npj Urban Sustainability 2 (1): 4. https://doi.org/10.1038/s42949-022-00047-z.
Toxopeus, Helen, and Friedemann Polzin. 2021. "Reviewing Financing Barriers and Strategies for Urban Nature-Based Solutions." Journal of Environmental Management 289 (March): 112371. https://doi.org/10.1016/j.jenvman.2021.112371.
Wilk, Bettina, Andreas Vetter, and Alice Schröder. 2021. "Tackling the Climate and Biodiversity Crises in Europe through Urban Greening Plans." https://citieswithnature.org/tools-and-resources/276.
Xie, Linjun, and Harriet Bulkeley. 2020. "Nature-Based Solutions for Urban Biodiversity Governance." Environmental Science and Policy 110 (February): 77–87. https://doi.org/10.1016/j.envsci.2020.04.002.

Activity C5: Scoping policy needs through dialogue with key EU-level actors.

Main support function: Linking up with biodiversity policy & strategies	**WPs involved:** WP1

Objective: This activity aimed to identify relevant policy entry points and knowledge needs to guide the strategic orientation of the urban NBS DC. It focused on exploring how the DC could contribute to the implementation the EU Biodiversity Strategy 2030 by engaging with key European actors involved in science-policy interfaces and capacity building for NBS.

Method/approach: Between November 2023 and June 2024, a series of targeted meetings were held with representatives from the Joint Research Centre, the Knowledge Centre for Biodiversity and NetworkNature+. These meetings served as informal consultations to gather perspectives on what the strategic policy focus of the Urban NBS DC should be, and how it could link to ongoing European policy monitoring, coordination, and capacity-building mechanisms. The meetings were exploratory and dialogical, allowing needs to emerge organically across institutions and roles.

Summary of results:
In the first exchange with the Joint Research Centre (01.11.2023), Target 14 was immediately identified as a strategic gap in the EU biodiversity monitoring landscape. Although it is expected to be included in the mid-term review of the EU Biodiversity Strategy, the target currently lacks dedicated indicators in existing EU dashboards. The discussion highlighted the absence of reliable urban-level data on whether and how cities are developing Urban Greening Plans, and raised the challenge of assessing the level of ambition behind these plans. Broader knowledge needs were also identified, including the definition and measurement of urban green spaces—particularly on private land—alongside the need for comparable indicators across Member States and better understanding of legal and governance barriers to urban greening.

The meeting with NetworkNature+ (26.03.2024) confirmed strong alignment with the objectives of the DC. Urban NBS is a core theme across its community of 75 Horizon Europe projects. Participants highlighted the SSBD's potential role as a knowledge broker and recommended building synergies with existing mechanisms, such as the UrbanbyNature programme, National NBS Hubs, and collaborative governance structures like task forces and project boards. They also suggested that ongoing stakeholder mapping and results from the Delphi process (Activity N.x) could inform how the DC supports public authorities and practitioners.

In the final exchange with the Knowledge Centre for Biodiversity (KCBD) (12.06.2024), the importance of developing a clear, policy-relevant request around Target 14 was emphasized. Participants recommended initiating pre-scoping meetings with relevant European Commission directorates (e.g. DG ENV, DG REGIO) to co-define priorities and ensure alignment with real policy needs. Rather than proposing a predefined topic, the suggested approach was to engage directly with EC stakeholders to identify pressing knowledge gaps and actionable entry points.

Linkages with other support functions:

- Activating topical networks: This activity contributed to the mapping of actors relevant to urban NBS, helping to identify key stakeholders for potential engagement in topical networks.
- Research prioritization: The insights gathered during this activity informed the conceptual design of the Delphi survey conducted under Activity N.X.

Main success factors (detailed in Annex 6):	**Main challenging factors (detailed in Annex 6):**
• Proactive policy scoping through informal engagement.	• Risk of duplicating existing policy support mechanisms.

Activity C6: Mapping the urban NBS community within NetworkNature+ and related mechanisms

Main support function: Activating topical networks	**WPs involved:** WP1

Objective: This activity aimed to familiarize and connect BioAgora with NetworkNature+, the most consolidated, top-down, multi-stakeholder platform for NBS at the EU level. The NetworkNature project and its follow-up project NetworkNature+, under the Horizon Europe funding program, is one of the several efforts of the European Commision to build and consolidate the NBS community at the EU level. The project aims to support and expand the multi-stakeholder platform created around NBS (not only for urban contexts) and strengthen partnerships within this "network of networks", with the specific mission of "creating opportunities for local, regional and international cooperation to maximise the impact and spread of Nature-based Solutions". An important aspect to take into account is that it does not purely focus on urban contexts but rather has a broader scope that includes other kinds of settings. The specific objectives of this DC activity were to:

i. Map of the EU urban NBS community organized under NetworkNature+,
ii. Identify the core structure and governance model of NetworkNature+,
iii. Analyse key tools and knowledge products developed within the project,
iv. And examine how NetworkNature+ supports coordination and strategic direction for the NBS community across Europe.

Method/approach: This activity was developed via various approaches. A preliminary desk study was conducted on the project online material. This enabled the identification of networks and organizations partnering in the project, the several mechanisms the project has put in place to achieve its mission, and the different products and databases accessible to broad NBS community. Further information on these elements was retrieved through bilateral interactions with the NetworkNature+ coordination team and some partners and participation in their processes and activities, including the in-person attendance to the NetworkNature Annual Conference - Busting myths: People ~~or~~ with nature on September 2024 and the NbS Italy Hub Annual Meeting on November 2024.

Summary of results: To support its mission of fostering a robust, multi-level community around NBS, NetworkNature+ collaborates with a set of key partner networks and organizations operating across different functional domains and geographic scales, contributing to the platform's multidimensional engagement strategy. The domains represented include Policy–Science, Science–Society, and Business & Finance interfaces, highlighting the cross-sectoral and transdisciplinary nature of the network. Geographically, these partners span both EU-level and global scopes, enabling alignment with European policy frameworks while also engaging with international agendas on biodiversity and sustainable development. It also maintains close interactions with the European Commission's DG RTD and DG ENV, ensuring alignment with EU policy priorities and scientific agendas. This diversity enhances the capacity of NetworkNature+ to act as a bridge between research, policy, practice, and innovation. These actors include:

- ICLEI – International Council for Local Environmental Initiatives: A global network of local and regional governments committed to sustainable urban development.
- Biodiversa+ – The European Biodiversity Partnership: A European-level partnership supporting research on biodiversity and fostering alignment of research agendas with policy and practice needs.
- Oppla – The EU Platform for Nature-Based Solutions: A European knowledge marketplace for natural capital, ecosystem services, and NBS, offering access to tools, resources, and expert communities.
- IUCN – International Union for Conservation of Nature: A global authority on the status of the natural world and the measures needed to safeguard it, bridging science and practice in conservation.
- IEEP – Institute for European Environmental Policy: An interdisciplinary, multi-stakeholder think tank producing evidence-based research and policy insights on environmental and sustainability issues.
- Steinbeis Europa Zentrum: An innovation partner supporting sustainable societal transformation and responsible industrial change across Europe.
- Horizon Nua: A not-for-profit organization advancing the transition toward a nature-positive economy through systemic change and collaborative innovation.

Among the mechanisms and operational structures NetworkNature+ has put in place to fulfil its mission, several are particularly relevant for informing the setup of the SSBD:

- Six Task Forces provide structured spaces for collaboration among EU-funded NBS projects on specific issues related to NBS implementation. These currently focus on: (i) harmonizing existing NBS databases and promoting knowledge sharing, (ii) developing integrated assessment frameworks and indicators, (iii) advancing business models and financial instruments, (iv) communication and dissemination of NBS knowledge, (v) education and training across levels, and (vi) co-creation and governance.
- Strategic clustering of 88 EU-funded research and innovation projects on NBS into six priority themes, including Biodiversity enhancement and ecosystem restoration; Sustainable food systems; Zero pollution; Climate adaptation, mitigation, and resilience; Sustainable finance, investment, and just transition; Sustainable urban and regional transformation. Under these clusters, NetworkNature+ develops and curates tools, training, and resources to support the uptake of NBS.
- An NBS Project Board, enabling regular exchanges between project coordinators and NetworkNature+ partners to align activities, share progress, and foster synergies.
- Training and capacity-building programmes, tailored to actors from science, policy, business, and civil society, to strengthen skills and understanding of NBS design, governance, and scaling.
- Six NBS Regional hubs, functioning as stakeholder networks that bring together researchers, practitioners, policymakers, and community actors. These hubs operate at both national and transnational levels (e.g. the Italy, Portugal, and Hungary Hubs, as well as the Nordic and Caucasus Hubs), and facilitate knowledge exchange, events, and collaborative learning in support of NBS deployment.

Among the different products and resources of the project, important ones include:

- A curated list of 88 projects EU-funded NBS Research Projects Tackle the Climate and Biodiversity Crises, which provides a snapshot of high-impact, research-driven projects, and is designed for policy audiences, funders, and stakeholders interested in how EU-funded research contributes to biodiversity and climate goals.
- Database of EU Research and Innovation Projects NBS: A comprehensive inventory of 471 projects funded by Horizon 2020, FP7, BiodivERsA, Interreg, and LIFE, aligned with the European Commission's definition of NBS. The database supports evidence synthesis, funding trend analysis, and gap identification across ecosystems and societal challenges, and includes EU, national, and some international projects, going beyond flagship research to encompass implementation and demonstration initiatives as well.
- NBS knowledge database: a repository that compiles EU and international tools and resources, e.g., scientific findings, policies, projects, and market-based instruments for NBS implementation.
- NBS knowledge gaps database**:** An evolving resource that identifies key gaps in the evidence base on NBS. Developed through a desk study and online consultation in 2021 and updated in March 2024, the database now includes over 600 knowledge gaps. It defines future research lines across thematic areas such as governance, technical design, capacity building, and ecosystem-based management. Gaps are categorized by type of NbS approach—e.g., protection, restoration, or management—and offer strategic insights for guiding research, policy, and innovation agendas in Europe and beyond.

- NBS case study finder: A global database of NBS interventions, showcasing practical examples from diverse contexts to support learning, replication, and evidence-based decision-making.
- NBS European Roadmap: A strategic document outlining key actions for advancing Nature-Based Solutions in Europe by 2030. It identifies research priorities, implementation pathways, policy integration needs, and capacity-building measures to support the widespread uptake of NBS across sectors and scales.

Linkages with other support functions:

- Answering request: The outcomes facilitated the identification and accessibility to Experts involved in the answering request function.
- Building evidence base: This DC identified the Task Force of harmonizing NBS knowledge databases as particularly valuable for testing the function "Building the evidence base", and participated in the activities in the Task Force.

Main success factors (detailed in Annex 6):	**Main challenging factors (detailed in Annex 6):**
• Proven structures for inclusive and organized collaboration. • Strategic alignment with EU policy priorities and institutions. • Regional hubs as a model for decentralized engagement. • Diverse knowledge resources supporting evidence use. • Capacity-building and continuous learning as a core mission. • Mapping key actors to build strategic networks.	• Limited visibility of urban-specific activities in a broader NBS scope. • Potential fragmentation across knowledge tools and platforms. • Dependence on interpersonal interactions to access network insights.

Activity C7: Mapping and connecting with actors outside NetworkNature+ working on urban NBS across diverse scales and domains

Main support function: Activating topical networks	**WPs involved:** WP5

Objective: This activity aimed to identify actors (i.e., organizations and networks) operating at the science–policy–society–business interface who are not formally part of NetworkNature+, but who have been working on urban NBS at global, EU, national, and local levels.

Method/approach: Actors were identified through desk research, participation in NetworkNature+ events (e.g., the NetworkNature Annual Conference 2024), and interviews with NBS experts conducted in collaboration with Task 5.1—some of whom were also involved in NetworkNature+ Task Forces. Interview details are reported in Activity C8. Specifically, at the end of each interview, the NBS DC team presented a visual overview of the NBS-related actors identified so far and asked interviewees to suggest any additional relevant actors not yet included. The list of actors was further expanded with new contacts made through parallel activities, including those related to research prioritization and responding to urgent policy requests.

The mapped actors were classified according to the following criteria:

- Involvement in up to four domains, including policy, science, society and business & finance.
- Governance levels, including local, national, EU and global.
- Engagement levels, categorized on a 3-point scale: level 3 - active engagement, level 2 – informed, and level 1 - no contact efforts or unresponsive actors.

Summary of results: The comprehensive list of actors is reported in Annex 1 and 2.

The mapping identified 64 external actors, broadening the reach of the NBS DC beyond the NetworkNature+ project (See Activity N.5). A large share of the actors operates at the interface between domains. The majority are involved in

policy (89%), while 55% work in science, 42% in society, and 19% in business and finance. Notably, some actors (e.g., CitiesWithNature, UrbanByNature, IUCN) operate across all four domains, reflecting their bridging role

These organizations span all governance levels, with a strong representation of local actors (41%), followed by national (28%), EU-level (20%), and global (11%).

In terms of engagement, 59% of the actors participated in DC activities, 14% were informed about BioAgora and the SSBD, and 27% were mapped but either not contacted or did not respond to outreach efforts.

The urban NBS community is diverse, cross-sectoral, and multi-level, but remains uneven in terms of active participation. The high number of policy-related actors and the strong participation rate suggest that the mapping was effective in reaching key stakeholders. However, future efforts should focus on involving underrepresented domains—particularly Business & Finance and Society—and strengthening engagement with less responsive actors.

Linkages with other support functions:

- Answering request: The outcomes facilitated the identification and accessibility to Experts involved in the answering request function.

Main success factors (detailed in Annex 6):	**Main challenging factors (detailed in Annex 6):**
• Multi-scalar reach of the urban NBS community. • Urban NBS community's multi-sectoral character. • Strong on-the-ground participation from local and national actors. • Entry points for strategic alignment with EU and global policy actors. • Mapping offers a strategic baseline for future stakeholder engagement.	• Partial reliance on interpersonal interactions for data collection. • Limited representation of specific domains. • Temporal limitation of project-based engagement. • Risk of reinforcing existing silos or overlooking emerging actors.

Annex: The list of relevant organizations, networks and projects for the NBS DC is provided in Annex 1 and 2.

Activity C8: Identifying capacity needs at the science-policy interface through interviews with urban NBS experts

Main support function: Capacity Building & Governance of Topical Networks	**WPs involved:** WP5

Objective: This activity, conducted in collaboration with WP5, aimed to identify the capacity development needs of diverse stakeholder groups working on urban NBS. The interviews explored what skills, knowledge, and resources are required for actors to more effectively engage at the science–policy–society interface, and to document existing practices that support the development of these capacities.

Method/approach:

The interviews followed a semi-structured format, guided by stakeholder-specific templates developed under Task 5.1. They were tailored to four key domains: science, policy, NGOs, and business, each with targeted questions to explore domain-specific challenges and capacity needs at the science–policy–society interface.

Each one-hour interview began with a brief introduction to the BioAgora project and the interview's purpose, followed by an open discussion on the interviewee's work and its relevance to biodiversity and urban NBS. The first section focused on how actors interact with scientific knowledge and influence policy processes. The second explored challenges in cross-sector collaboration and the skills, tools, and knowledge needed to improve science-policy engagement and co-production. A third section introduced the urban NBS DC and invited interviewees to suggest additional relevant contacts. The final section allowed for open reflections and ensured transparency around data use and consent.

The urban NBS DC supported the process by selecting five interviewees representing different stakeholder types including scientists, policymakers, and civil society actors, presenting the DC's objectives, and facilitating the discussions.

All interviews were transcribed and analyzed qualitatively by Task 5.1 using a narrative coding approach. Responses were grouped into 18 categories of capacity needs, which were further organized into three dimensions: individual skills, organizational capacities, and systemic factors. This analysis helped identify capacity gaps patterns across stakeholders' groups and informed the development of the NBS topical network.

Summary of results:

Findings indicate **capacity needs** across all 18 identified categories. All interviewees emphasized the need to foster interdisciplinary and transdisciplinary collaboration. They highlighted the importance of building synergies and strengthening cooperation across sectors and disciplines—particularly with scientists.

Three experts also identified the need for harmonized timelines. They noted that sectors involved in NBS—such as policy, science, and business—often operate on different schedules. Effective NBS implementation requires mechanisms to better align these timelines or develop flexible processes that can accommodate each sector's constraints.

Stakeholders also pointed to the need for stronger skills in co-producing knowledge, especially in integrating scientific, policy, and practical insights. Three experts highlighted the lack of training for local decision-makers and the need for institutional frameworks that promote communication, collaboration, and engagement skills.

Three experts also stressed the importance of broadening capacity-building efforts to include a wider range of stakeholders, ensuring that NBS strategies reflect diverse perspectives, particularly those of marginalized communities, and that they address social justice concerns.

Research gaps were also raised, including the lack of evidence to support business investment in NBS—particularly from small enterprises. Two experts further emphasized the broader investment gap in the private sector, pointing to the limited financial capacity of small businesses to engage in NBS initiatives.

On communication, two experts noted challenges in how the concept of NBS is conveyed and understood—particularly among stakeholders outside the European Commission or those not operating at the EU level.

Two experts mentioned personal time management as a barrier. They reported difficulties staying engaged in knowledge co-production processes and biodiversity strategies after project completion. One expert also noted a lack of institutional support for smaller organizations and businesses to participate in NBS efforts.

The interviews highlighted a wide range of **opportunities** to strengthen capacity development for NBS, particularly by shifting beyond conventional formats such as webinars and online courses. Experts emphasized the added value of more interactive and immersive approaches, including residencies, summer schools, and collaborative workshops, which offer space for deeper engagement, relationship-building, and transdisciplinary exchange. Initiatives like Resonances IV, led by JRC SciArt, exemplify this approach by bringing together scientists, artists, and policymakers to co-create responses to complex ecological challenges. These formats were seen as particularly effective in supporting capacities such as knowledge co-production, inter- and transdisciplinary collaboration, inclusion, and the integration of diverse values and worldviews.

A strong consensus emerged around the importance of co-creation and engagement as core elements of capacity-building. Experts from science, policy, and civil society underscored the need for participatory processes that involve a broader range of stakeholders, including local practitioners, citizens, NGOs, and underrepresented groups. Good practices mentioned include internal workshops at the European Commission, the NetworkNature Task Forces, and the NbS hubs in various cities, all of which create structured opportunities for exchange and mutual learning across sectors and levels of governance. Projects like Connecting Nature, EmpowerUs, and Clever Cities were also highlighted for their tools and methods that support collaborative planning and empowerment of local communities.

In addition, several tools were identified as effective in supporting learning and decision-making, including the Urban Nature Atlas, the Urban Governance Atlas, and practical handbooks and manuals.

Finally, the integration of financial actors and investors into capacity-building efforts was identified as crucial for scaling NBS. Experts highlighted the value of case studies and tools like participatory budgeting—a process where citizens help decide how public funds are spent—as effective ways to demonstrate the relevance and return on investment of NBS. This is especially important for engaging small and medium-sized enterprises, which often lack the resources to participate fully.

Linkages with other support functions:

- Activating topical networks: Informed the mapping of NBS-related actors developed in the Activity C7.

Main success factors (detailed in Annex 6):	**Main challenging factors (detailed in Annex 6):**

• Comprehensive categorization of capacity needs. • Validated relevance of co-creation and engagement. • Embedding immersive and transdisciplinary formats into capacity building. • Leveraging existing practices and platforms.	• Unequal access to NBS capacity-building opportunities. • Limited representation from the business domain.

Activity C9: Conducting a workshop to test elements of the governing principles of the SSBD and build capacity for interdisciplinary interactions and collaborations at the SPSI	
Main support function: Capacity Building & Governance of Topical Networks	**WPs involved:** WP4
Objective: This activity aimed to test a workshop model for capacity-building at the SPSI by providing participants with a hands-on experience of collaborative decision-making around a biodiversity-related challenge. Through a role-playing exercise simulating the requalification of a degraded urban industrial site, participants assumed the perspectives of diverse stakeholders—including public authorities, scientists, community members, and businesses—and negotiated potential NBS for the site. The objective was to strengthen participants' skills in interdisciplinary collaboration, inclusive negotiation, and knowledge co-production. As part of the BioAgora WP5 series of workshops, it aimed to generate insights into the tools, governance principles, and participatory methods that could inform the development of the SSBD.	
Method/approach: The workshop was piloted at the 10th International Degrowth Conference and the 15th Conference of the European Society for Ecological Economics, held jointly in June 2024 in Pontevedra, Spain. These conferences convene diverse and critically engaged communities committed to strong sustainability and systemic transformation. They bring together scientists, policymakers, ecological economists, civil society actors, and practitioners who are already confronting tensions with vested interests and actively rethinking the relationship between nature and urban development. In this context, the workshop offered a valuable opportunity to explore those tensions through the lens of urban NBS implementation, using inclusive and negotiated decision-making processes. The presence of ecological economists also helped integrate perspectives from the business and finance sectors—previously underrepresented in the NBS network. The workshop simulated a decision-making process around a fictional but realistic case study: the requalification of a 100-hectare abandoned industrial area in a mid-sized city ("Busytown") through urban NBS, such as the creation of a public park (See Annex 3). The scenario introduced potential green gentrification concerns, requiring participants to reflect on social equity, environmental impact, and investment models in urban transformation. Participants were assigned stakeholder roles—including local government planner, environmental scientist, oil company representative, small business owner, and elderly residents. These roles were designed to reflect different interests, values, and levels of power in urban NBS planning (See Annex 3). The workshop followed a structured three-phase format: • Individual reflection: Participants reviewed their assigned roles and formulated initial positions on the proposed NBS project based on their stakeholder's values, concerns, and goals. • Bilateral exchange: Participants interacted in pairs to negotiate, share knowledge, and explore conflicting or complementary views. This unstructured format, with limited time and open interaction, was intended to mirror the uncertainties and frustrations often present in real-life negotiations. • Group deliberation and debrief: All stakeholders reconvened for a plenary discussion to share their preferences and search for common ground. This final session emphasized inclusive deliberation, the identification of co-creation principles, and reflection on the skills, tools, and institutional conditions needed for effective stakeholder engagement at the SPSI.	
Summary of results:	

The 1.5-hour workshop included five participants with backgrounds in social sciences and affiliations with NGOs or civil society organizations. The group was balanced in age and disciplinary background related to urban greening and NBS, reflecting the diversity of stakeholder types relevant to NBS governance. It offered space for participants to reflect on how science-policy-society-business interactions can unfold in practice. While the process of deliberation and stakeholder exchange was widely appreciated, several insights emerged regarding the limits and risks of participatory approaches.

Participants found the exercise engaging and intellectually stimulating, particularly the opportunity to explore different stakeholder perspectives. However, many expressed dissatisfactions with the final policy outcome, which was perceived as overly technocratic and insufficiently attentive to the social dimensions of the issue. There was a sense that the final solution emerged too quickly, without sufficiently exploring the underlying tensions or alternative visions. This prompted reflection on how scientific knowledge, when dominant in the process, can unintentionally marginalize other forms of knowledge and weaken the legitimacy of decision-making.

A recurring theme in the discussion was the concern that science is often positioned as the primary source of "correct" solutions, which can lead to decision-making processes that prioritise technical optimisation over deeper societal considerations. Participants stressed that science should instead contribute by offering diverse policy options, revealing systemic weaknesses, and supporting democratic deliberation, rather than closing down debate. There was strong emphasis on the need for science to engage with the political, ethical, and justice dimensions of environmental issues—rather than presenting knowledge as neutral or detached from power. In this view, socially relevant science should not only inform policy, but also help illuminate whose interests are served or excluded by particular interventions, such as NBS projects that risk displacing vulnerable communities.

Another critical insight concerned the tokenistic use of public participation. Participants noted that while participatory processes are often presented as inclusive, they frequently serve a symbolic function, offering little real influence over decisions. This observation was particularly salient when participants played roles with less formal power, such as vulnerable residents or small business owners, whose voices were not meaningfully reflected in the final agreement. The exercise raised questions about how knowledge is curated, who gets to shape the narrative, and how dissent is handled.

The notion of consensus also came under scrutiny. Participants warned that pushing for agreement too early can result in weak compromises and obscure important disagreements. Instead, they suggested that participatory processes should allow conflict to surface and be explored as a necessary part of building more reflective and robust outcomes.

Despite these critiques, participants found consultation to be a useful tool for structuring dialogue and building shared understanding. It helped clarify stakeholder positions and provided a sense of process legitimacy. However, its effectiveness was seen to depend on the diversity of the stakeholder group, the time available, and the skills of facilitators.

Overall, the workshop highlighted the importance of designing participatory processes that go beyond inclusion for its own sake. Effective engagement requires attention to power asymmetries, knowledge hierarchies, and the social and political context in which environmental decisions are made. These insights are highly relevant for shaping the participatory mechanisms and governance models of the SSBD for Biodiversity, particularly in its efforts to support socially grounded and transformative NBS implementation.

Linkages with other support functions:
No direct link was found with other support functions.

Main success factors (detailed in Annex 6):	**Main challenging factors (detailed in Annex 6):**
• Role-play workshops work well even with limited time and resources. • Scientists need support to engage with the political side of NBS. • Validated workshop to promote inclusive stakeholder engagement.	• Limited control over conference logistics. • Short session time restricted depth of engagement. • Uncertainty in participant recruitment and diversity. • Lack of structured follow-up to assess long-term impact.

Annex: The description of the requalification greening project and participants roles is provided in Annex 3.

Activity C10: Conducting a workshop to explore the transformative potential of NetworkNature+.	
Main support function: Capacity Building & Governance of Topical Networks	**WPs involved:** WP2, Task 2.3
Objective: This workshop aimed to test the collective learning and assessment framework for the transformative potential of networks, as developed in BioAgora Deliverable D2.3, by applying it to the case of NetworkNature+. Envisioned as a mutual learning exercise between BioAgora and NetworkNature+, the goal was to reflect on how principles of transformative change can be interpreted and applied within an existing network structure. It also served to explore potential synergies and opportunities for collaboration between NetworkNature+ and BioAgora that could support transformation in biodiversity governance and practice.	

Method/approach: The online workshop was held on July 24, 2024, and included six participants actively engaged in NetworkNature+, ICLEI, and IUCN. These participants represented a range of roles and expertise within the network ecosystem. The agenda included the following components:

- Welcome and introduction to BioAgora and the NBS Demonstration Case
- Overview of the workshop objectives and activities
- Introduction to the "Three Spheres of Transformative Change"
- Presentation of the assessment framework
- Main activity: interactive exploration of the seven steps of the theory of change
- Closing reflections and evaluation

Participants contributed their insights collaboratively using a Miro Board, structured around the framework's seven sequential steps for assessing the transformative potential of networks. Each step was explored through targeted probing questions, as outlined below:

- Step 1 – Motivation and Mission: This step assesses the network's ability to reflect on and evolve its purpose and foundational principles.

  Probing questions: Is the network capable of reflecting on and evolving its mission? Does the network aim to address root causes?

- Step 2 – Composition and Structure: This step focuses on member diversity and the network's embeddedness in broader systems.

  Probing questions: Are the members of the network diverse? Is the network embedded in and connected with other networks?

- Step 3 – Internal Processes: This step evaluates transparency, ethical practices, and a collaborative culture within the network.

  Probing questions: Does the network work in a transparent, inclusive, pluralizing, and collaborative way? Is there a culture where people can be challenged and feel safe?

- Step 4 – Activities: This step considers the network's capacity for learning, strategic action, and knowledge co-production.

  Probing questions: Does the network have capabilities for futuring, assessing, synthesizing, prioritizing, and strategizing? Does the network coproduce knowledge and support learning?

- Step 5 – External Processes: This step assesses the network's ability to engage with diverse actors, including both challengers and status quo players.

  Probing questions: Does the network have a strategy for dealing with various target groups? Does the network have the skills to distinguish when to collaborate, challenge, or disrupt?

- Step 6 – Outputs: This step reviews the innovativeness and influence of the network's outputs.

  Probing questions: Do outputs appear to be influential in terms of leading to change (e.g., behavioral change, awareness, recommendations, policy)?

- Step 7 – Outcomes: This final step focuses on the network's observable impacts in society and policy.

Probing questions: Does the work of the network lead to pluralized and respectful societal debates?
Summary of results: The workshop outcomes were structured around the seven steps of the theory of change, highlighting both strengths and areas for further development. Motivation and Mission: NetworkNature+ does not explicitly position itself as addressing the root causes of biodiversity loss. However, it contributes indirectly through its community-building efforts, by engaging a diverse range of actors and fostering awareness and knowledge on NBS. The network has supported the creation of national NBS hubs, which are emerging as platforms for mindset change. Reflection and reorientation are part of its culture, as seen in upcoming activities like the redesign of its website, indicating openness to revisiting its audience and purpose**.** Composition and Structure: There is a strong ambition to diversify network membership beyond its current research-focused base, aiming to involve more landowners, urban planners, and other on-the-ground stakeholders. NetworkNature+ maintains connections with several international networks and includes an advisory board of eight members, all representing relevant organizations. However, its cultural reach remains largely European, and there is room to strengthen ties with underrepresented groups and external networks, such as Natura Network. Internal Processes: NetworkNature+ demonstrates strong commitment to transparency and inclusiveness, exemplified by its use of open calls for event participation and its openness to different viewpoints. However, the network still faces challenges in attracting more critical or dissenting voices, particularly from private sector actors. While internal power imbalances appear limited—largely due to the like-minded nature of current members—this homogeneity can also limit constructive debate. There is a recognized need to broaden the diversity of perspectives within the network and to create space for more critical engagement that can challenge assumptions and enrich internal learning. Activities: NetworkNature+ plays an active role in knowledge co-production and capacity building, with key outputs including national NBS hubs and policy roadmaps. It demonstrates adaptability in setting strategic priorities—for example, through the European Environmental Bureau initiative, which assesses EU policy landscapes to identify where the network can most effectively act. However, collaboration among core partners such as IUCN and ICLEI remains a challenge. Strategic decisions are often made separately by each organization, as the existing governance structure—particularly the General Assembly—offers limited time and space for joint decision-making. There is a need for stronger internal coordination and clearer mechanisms to support shared strategic planning. External Processes: NetworkNature+ does not yet have a clearly defined strategy for directly engaging marginalized or underrepresented groups. However, some efforts occur indirectly through affiliated projects and partner networks—for example, through initiatives like Clever Cities, which included engagement with refugee communities. The network's approach generally emphasizes collaborative and challenging approaches with institutional actors, rather than pursuing disruptive strategies. However, some degree of disruption is present through its connections with more activist-oriented organizations, such as the European Environmental Bureau. Strengthening intentional outreach to marginalized groups and clarifying when to collaborate, challenge, or disrupt could enhance the network's capacity to support inclusive and transformative change. Outputs: The network has produced several high-impact outputs, such as the European Roadmap to 2030 for Research and Innovation on NBS, national NBS hubs, and standardization efforts. These have gained traction at the policy level, reflected in the growing EU funding for NBS—from just 4 projects initially to 76 (by 2024), with €655 million invested. While awareness-raising is a clear intention, the direct impact on societal change remains difficult to measure and merits further reflection. Outcomes: NetworkNature+ aims to contribute to broader societal and policy shifts by fostering dialogue on systemic transformation. Its annual conferences, which focus on topics such as transformative change and nature-positive economies, are designed to influence the narrative around biodiversity and sustainability. The network sees growing potential for policy influence—particularly in advancing the nature-positive economy agenda—leading up to 2027. At the same time, NetworkNature+ acknowledges the inherent complexity of outcomes such as paradigm shifts, policy change, or the empowerment of key actors. These outcomes depend on broader societal dynamics and are shaped by the actions of many actors beyond the network's direct sphere of influence. To better understand and enhance its

<table>
<tr><td colspan="2">long-term impact, the network recognizes the value of engaging in peer learning with other networks, which can provide fresh perspectives and methods for evaluating transformative outcomes.</td></tr>
<tr><td colspan="2">Linkages with other support functions:
Overarching function of transforming processes within and between science and policy</td></tr>
<tr><td>Main success factors (detailed in Annex 6):
Effective application of a structured learning framework.
Culture of reflection and adaptive thinking in the network.
Demand for cross-network peer learning.
Strategic influence through policy-aligned outputs.</td><td>Main challenging factors (detailed in Annex 6):
Insufficient internal coordination mechanisms.
Underdeveloped strategy for inclusive engagement.
Ambiguity for engaging with power and resistance.
Difficulty in evaluating long-term transformative change.</td></tr>
</table>

5. Transforming processes within and between science and policy

This section provides details on the activities carried out by the Freshwater and Urban NBS DCs aimed at transforming processes within and between science and policy. These include:

- Activities B8 to B12 (Freshwater DC)
- Activities C11 to C15 (Urban NBS DC).

5.1. Freshwater DC

To demonstrate how the Freshwater DC is actively reshaping the interface between research and policy, we have selected four main activities that collectively span the core SSBD functions, from distilling legal frameworks and activating stakeholder networks, through horizon scanning and research prioritization, to generating robust evidence and embedding biodiversity objectives into broader land-use and heritage planning. Each activity showcases a different mechanism for moving scientific insight into decision-making (and vice versa), testing methods for co-production, iterative feedback, and capacity building that are essential to transforming how EU river-restoration science informs, and is informed by, policy at all levels. Our activities underscore our thematic focus on creating dynamic, cross-sectoral processes that ensure free-flowing-river restoration is guided by the best available knowledge, aligns with evolving regulatory requirements, and results a truly integrated "network of networks".

Activity B8 – Conducting a pan-European research prioritisation and horizon scanning for river restoration research.	
Main support function: Research prioritization	**WPs involved:** T3.1, T3.2, T3.3, and T5.3 Tasks
Objective: To assemble an inclusive, interdisciplinary research agenda for free-flowing river restoration, drawing on the collective expertise of natural scientists, social scientists, practitioners and policymakers, and to channel those priorities into EU Research & Innovation processes. We tested how disciplinary background and question framing shape priorities, ensuring the final list addresses both ecological knowledge gaps and the real-world barriers to implementing the Nature Restoration Law target to restore free-flowing rivers.	
Method/approach: We rolled out a three-stage process to engage the full spectrum of freshwater restoration actors across Europe. First, we launched an open scoping survey (March 4–23, 2024), inviting scientists, practitioners, water managers, policymakers and NGO representatives inside and outside our network to propose up to three research questions each and to share their disciplinary background. The survey was distributed through our European Rivers Cluster, professional mailing lists and a snowball sampling approach to maximise reach. Next, on April 18 2024 at the Free Flow conference in Groningen, we convened 18 participants, balanced between natural and social scientists and including on-the-ground practitioners, in an interactive workshop. There, attendees reviewed and refined the survey outputs, explored how question framing influenced responses, and worked in breakout groups to shape a draft list of 27 research topics that bridged ecological and societal concerns. Finally, from October 22 to November 15 2024, we conducted a ranking survey with the revised topic list, asking 175 of the original respondents to select and order their top ten priorities. We applied a transparent, weighted scoring system, combining average rank, top-10 frequency and top-3 appearances, and used Correspondence Analysis to reveal how disciplinary background affected topic preferences. This three-pronged approach ensured both breadth of input and depth of critical reflection, producing a robust, interdisciplinary research agenda for river restoration.	
Linkages with other support functions: • Horizon Scanning • Feedback to policy frameworks: Our final results will be communicated to Horizon Europe programme officers and DG ENV, offering concrete guidance on which research areas to fund and how to align upcoming calls with the Nature Restoration Law's objectives.	

- Supporting & monitoring biodiversity mainstreaming: The exercise surfaced critical socio-ecological research needs (governance, stakeholder engagement, cost–benefit tools) that underpin the broader mainstreaming of freshwater biodiversity across EU policy and practice.
- Evidence base: We consolidated 714 expert inputs into 425 topics, refined them through expert deliberation, and applied rigorous quantitative weighting and correspondence analysis, thereby creating a robust, transparent evidence base to inform science-policy interfaces and future research investments.

Summary of results:
The results revealed not only which questions topped the list, but also how and why they did so. From 714 initial suggestions we distilled 425 unique topics and, through our workshop, refined these into 27 well-defined research questions. When 127 respondents took part in the ranking survey, five themes emerged as clear priorities across disciplines: standardising national barrier-inventory methods, developing cross-sector governance frameworks, designing cost–benefit tools for prioritising restoration investments, creating participatory monitoring protocols, and evaluating the long-term ecological and societal outcomes of restoration projects. Crucially, our dual-frame design showed that participants prompted to think about "roadblocks to action" placed twice as many socio-policy questions in their top ten than those given an "understanding" prompt, while natural-science respondents consistently favoured process-based ecological questions. Correspondence Analysis visualised these divides, identifying a set of "bridge" topics (e.g., governance–ecology integration and stakeholder-driven adaptive planning) that attracted high scores from both groups. These insights have already been packaged into a concise set of recommendations and forwarded to Horizon Europe officers, where they are influencing the 2026–27 calls for freshwater restoration research.

Success factors (detailed in Annex 6):	**Challenging factors (detailed in Annex 6):**
• Combining scoping, workshop and ranking maximized reach and depth. • An open call for questionnaire respondents captured diverse perspectives across the freshwater community. • Face-to-face deliberation sharpened topic definitions and built buy-in. • Weighted scoring and analysis ensured clear, defensible priorities.	• Some early respondents did not return for the ranking phase. • Cleaning hundreds of suggestions into coherent topics remained time-intensive. • Ensuring comprehensiveness while keeping the list manageable required careful editorial judgment. • It was challenging to get policymakers/politicians to be involved in this effort.

Annex: The full survey instrument for the scoping and raking survey is provided in Annex 4.

Activity B9 – Developing the scientific manuscript "Removing barriers: a collaborative research agenda for restoring free-flowing rivers" to translate our prioritised research topics into a structured agenda and policy recommendations

Main support function: Research prioritization	WP involved: WP1 and WP3

Objective:
To synthesize our pan-European research-prioritisation results into a peer-reviewable manuscript that presents a co-developed research agenda, grounded in both ecological and socio-policy needs, for restoring free-flowing rivers under the EU Nature Restoration Law. This output aims to guide future research funding, inform policy frameworks, and foster interdisciplinary collaboration.

Method/approach:
Building on the scoping survey, workshop outputs and ranking analysis, we convened the author team, comprising natural scientists, social scientists and practitioners (who all participated in our surveys), to build the 27 priority topics into a coherent narrative. Drafts were structured around the top ten ranked priorities and illustrated with key figures (topic frequencies, final ranking, correspondence analysis). Successive versions were circulated among the author group for targeted feedback. The final manuscript integrates tables of top priorities, spatial-scale annotations and CA biplots, and maps each priority onto policy instruments (NRL Article 9, Habitats Directive, WFD).

Linkages with other support functions:
- Feedback to policy frameworks: By explicitly mapping each top research priority onto the Nature Restoration Law (Article 9), the Habitats Directive and the Water Framework Directive, the manuscript provides clear, actionable guidance that feeds directly into Horizon Europe calls and national restoration planning.

- Supporting & monitoring biodiversity mainstreaming: The balanced agenda, combining ecological and socio-policy topics, helps embed freshwater biodiversity restoration into broader EU policy and practice, setting measurable research targets that can serve as indicators of progress toward the EU Biodiversity Strategy 2030 goals.
- Evidence base: Our work creates a transparent, stakeholder-validated evidence base to guide future research investments and underpin adaptive management across Member States.

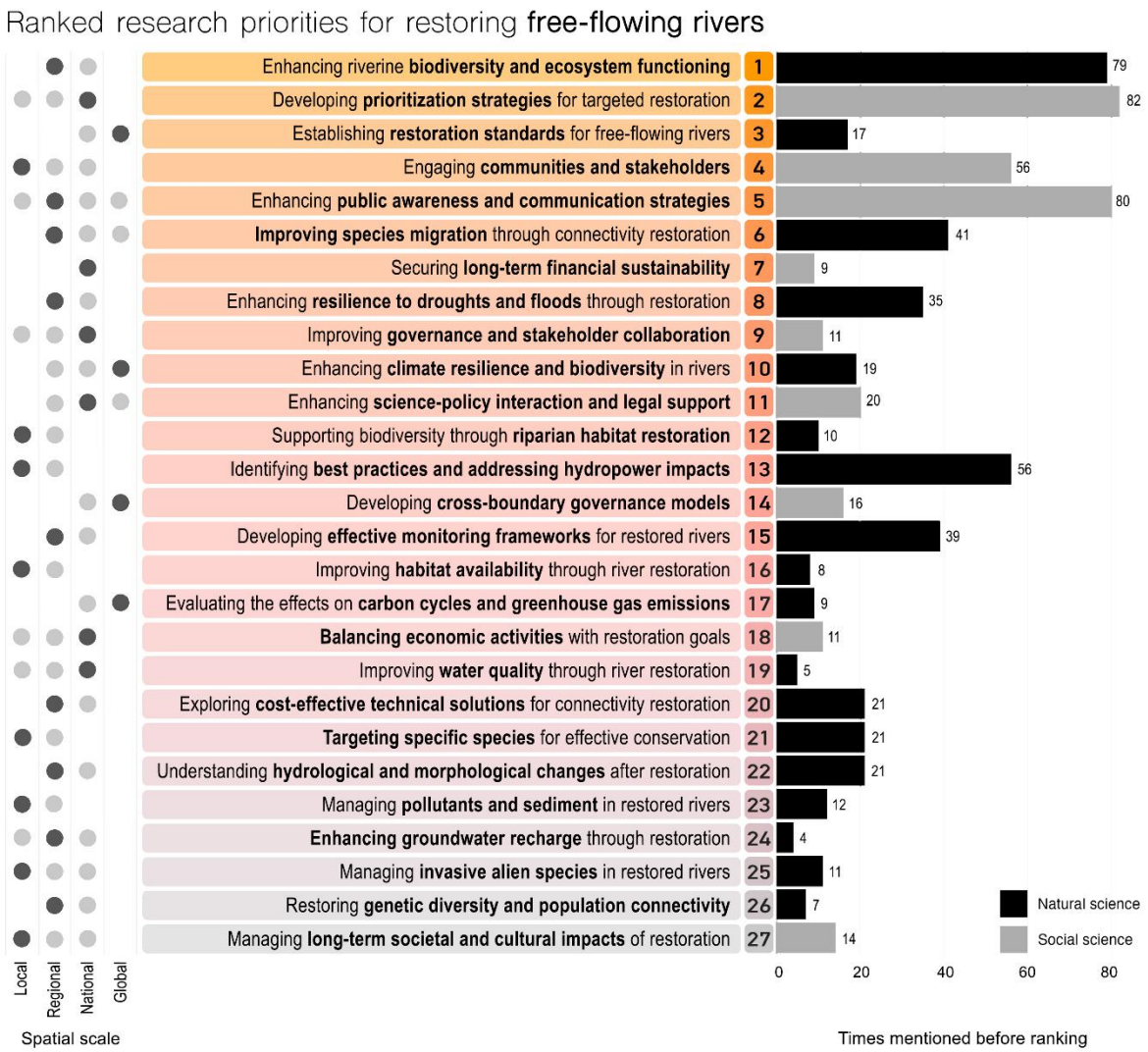
Summary of results:

The manuscript distills the input of 237 experts from 45 countries, who submitted 714 suggestions consolidated into 425 unique research topics, into a focused agenda of 27 draft priorities. Leading the list were core ecological questions ("enhancing riverine biodiversity and ecosystem functioning") and equally critical socio-policy concerns ("developing prioritization strategies for targeted restoration" and "establishing restoration standards for free-flowing rivers"). Notably, social-science topics such as governance frameworks and financing models, though less frequently mentioned in the initial survey, climbed into the top ten during ranking, underscoring the need for actionable tools as much as ecological knowledge. Spatial-scale annotations showed that higher-ranked topics tend toward national and global relevance, while lower-ranked items often address local or regional implementation needs.

Our analysis revealed a clear split between natural-science and social-science priorities, with a handful of "bridge" topics (e.g., integrated governance-ecology strategies) having support from both groups. NGO and water-management respondents, for example, prioritized community engagement and economic viability, whereas academic ecologists leaned toward technical questions about connectivity and species migration. These patterns highlight not only the disciplinary divides in research needs but also the areas where interdisciplinary collaboration can deliver the greatest impact. By mapping each priority to EU policy instruments (NRL Article 9, the Habitats Directive and the Water Framework Directive), this work provides a concise, stakeholder-validated roadmap to guide Horizon Europe and national research calls toward the most pressing questions for restoring Europe's free-flowing rivers.

Figure 5: Final ranking of the 27 research priorities for restoring free-flowing rivers, arranged from highest rank (top) to lowest (bottom). The bar charts on the right show how many times each topic was originally mentioned in the scoping survey (see also Fig. 1). Grey bars denote social science topics, while black bars represent natural science topics. The dots on the left indicate the spatial scales (local, regional, national, and global) assigned to each topic based on its scope, potential impact, and capacity to influence policies or

ecosystems. Light grey dots indicate the probable spatial scale of action for each topic, while dark grey dots denote the scale most frequently assigned by the author group.



Success factors (detailed in Annex 6):

- Involving experts from our European Rivers Cluster and beyond ensured the work reflected real-world insights and built ownership across diverse stakeholders.
- High-quality visualizations (ranked lists, CA biplots, spatial-scale annotations) make the complex prioritization results accessible to scientists and policymakers alike.
- Purposeful integration of social-science priorities alongside ecological topics created a balanced agenda that resonates across sectors.

Challenging factors:

Not found

Activity B10 – Assessing barrier (and removal) impacts on migratory fish and crafting a prioritisation framework to guide NRPs under the NRL	
Main support function: Feedback to policy frameworks	WPs involved: WP1

Objective:
We sought to link barrier-removal activities directly to gains in freshwater biodiversity by quantifying how removing instream barriers reopens critical migration pathways for Europe's most vulnerable fish, both on diversity and on the case study groups sturgeons, eels and salmonids. Our aim was to translate this into a spatially explicit prioritisation map and narrative guidance that Member States can plug into their National Restoration Plans under Article 9 of the Nature Restoration Law. By focusing on species' life-history needs and conservation status, we intended to ensure that every km of restored river yields maximum benefit for migratory fish resilience, ecosystem function and cross-sector policy coherence.

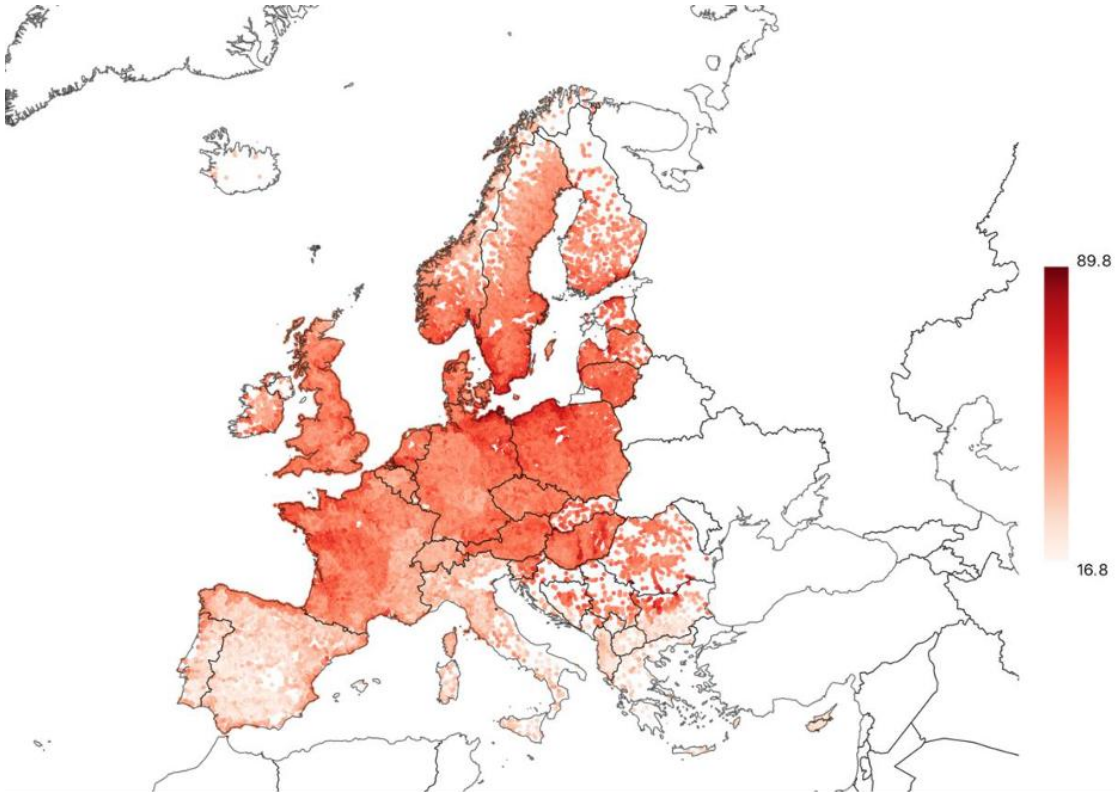
Method/approach:
We built on Europe's largest barrier database (AMBER project) and removed barrier database (Dam Removal Europe; DRE) and the continental river network to link each obstacle with its river order and the ranges of over 100 migratory fish species. We first calculated a vulnerability score for each species, then overlaid species-range maps to count total and high-priority fish richness at every barrier. By combining those biodiversity metrics with the river's size (Strahler order) and local barrier density, we derived a unified impact score that highlights which removals would yield the greatest benefit for migratory fishes. Throughout, we worked together with Wetlands International Europe and Dam Removal Europe, holding joint meetings to refine our scoring choices and verify that our top priorities align with real-world recovery outcomes.

Linkages with other support functions:

- Research prioritization: By identifying river reaches where barrier removal would unlock the greatest gains in fish connectivity and biodiversity, our analysis sharpens the focus of future research calls, ensuring that limited funding targets the most ecologically impactful questions and regions.
- Horizon scanning: Continuous monitoring of barrier inventories, removal rates, and shifting fish-rich hotspots allows us to anticipate where restoration demand will surge, helping to flag emerging pressures (e.g., new hydropower proposals) and opportunities (e.g., approved removal schemes) before they become entrenched.
- Building evidence base.

Summary of results:
Our Europe-wide assessment developed a simple yet very needed prioritization index that blends migratory-fish richness, species vulnerability, river network size and barrier density to spotlight where removing a single obstacle will yield the greatest ecological return. Applying this index to over 620 000 existing and 8 000 historic removal sites revealed clear geographic "hotspots" for migratory fishes, notably the Baltic and North Sea catchments, headwater tributaries of the Danube and Alpine-foothill systems, where barrier removal would reconnect key spawning and feeding grounds for dozens of at-risk species. In partnership with Wetlands International Europe and Dam Removal Europe, we have distilled these insights into concise case studies for 3 fish families (sturgeon, salmonids and eels). Although full implementation remains a future goal, our framework gives Member States a transparent, tool to guide the selection of barriers to remove under their National Restoration Plans. By aligning on-the-ground removal projects with this evidence base, Europe's rivers can make real progress toward the 25 000 km free-flowing target while delivering maximum return for migratory fishes.

Figure 6: Barrier Removal Impact Scores for AMBER barriers. Each point denotes a barrier, shaded from cool to warm tones according to its BRIS value, ranging from low impact (16.8) to high impact (89.8), to illustrate where removal would most benefit migratory fish



Success factors (detailed in Annex 6):	**Challenging factors (detailed in Annex 6):**
• Integrating ecological insights, hydrological data, and GIS on harmonized pan-European layers (IUCN ranges, hydrological networks, barrier inventories) produced robust, policy-ready priorities. • NGO partners (DRE and Wetlands International) validated our scoring and case-study selection, smoothing uptake in restoration workflows. • Our empirical case studies provided compelling proof points for policy- and decision makers to prioritize dam removal.	• Incomplete species range and barrier metadata required extensive validation and confidence scoring. • Harmonising large geospatial layers and custom indices demanded intensive GIS and scripting effort. • Balancing continent-wide analysis with local-scale relevance is challenging. • Lack of data about terrestrial area planning and how lateral river zones can become or stay connected.

References:

https://damremoval.eu/
https://amber.international/
https://europe.wetlands.org/home-2/our-work/wetland-biodiversity/swimways/

Activity B11– Participating as BioAgora representative in the EUBP expert subgroup on the NRL.	
Main support function: Supporting function of feedback to policy frameworks	**WPs involved:** NA

Objective:

BioAgora became member of the EUBP expert group on the NRL to provide knowledge transfer from science to the involved stakeholder groups. Stakeholders and especially lobbyist groups of the expert group often perceive a lack of knowledge transfer from academia, calling upon a so-called Ivory Tower. The membership of BioAgora in this expert group is to improve the communication of science and to give feedback to the EU about gaps and potential for transformative change.

Method/approach:
One member of the Freshwater DC, Sibylle Schroer, is presentative for BioAgora in the EUBP expert group. She is attending the meetings and gives feedback to the documents developed. In observing the discussion arguments from lobbying groups with economic interest in land and freshwater change are collected and the science evidence analyzed on the subject. The main priority is put on the implementation of Articles 4 to 9 of the NRL.

Linkages with other support functions:

- Supporting and monitoring biodiversity mainstreaming. In providing science knowledge to the expert panel and arguments for the investment into nature restoration, stakeholder groups can become more aware of the issues of biodiversity loss and can transform thinking towards economic benefits through nature and resource protection.

Summary of results:
Feedback was given during the first meeting and after the dissemination of documents. 18 suggestions were submitted for the technical background notes. The collaboration in the expert group is ongoing over the reporting period of task 1.2.

Success factors (detailed in Annex 6):	**Challenging factors (detailed in Annex 6):**
• Opportunity to bring the perspective of biodiversity science into the expert group, in which many lobbyists are present • Potential to learn the needs and gaps from science knowledge transfer • Potential to shape policy briefings and other outreach communication accordingly to the needs for the implementation pf the NRL.	• A lot of speaking time is given to group members with economic interest, who are not interested in the implementation of the regulation. • The discussion is often misleading as if the law had not already been passed after many hurdles. • An invitation to economical scientists to provide knowledge to the various NGOs and lobbyist groups is highly recommended to move forward with the implementation of guidelines for the member states.

Activity B12– Exploring interdisciplinary synergies among economic, social, and environmental pillars through stakeholder dialogue in the Danube Basin.

Main support function: Supporting and monitoring biodiversity mainstreaming, and Evidence base	**WPs involved:** WP1, WP2 and WP5

Objective:
The Freshwater DC will explore the stakeholder interactions using the pilot area of the Danube Basin, in this analyze we will include representatives that hold various types of knowledge (e.g. indigenous, local, scientific, various disciplines, practice, implementation) and positions of power (e.g. funders, brokers, policy makers, lobbyists). We will analyze success-stories and gaps in knowledge communication to various stakeholder groups in order to improve the knowledge transfer of the scientific perspective of river restoration. Further, we will analyze the potential of bottom up approaches in researching the cultural values and how these can empower citizen science engagement for river restoration, using the example of the Danube basin.

Method/approach:
At November, 29, 2024 the Freshwater DC presented for the Future Dialogue of the Leibniz Research Network 'Knowledge for Sustainable Development', at the German Mining Museum Bochum. The dialogue was dedicated to the question of how historical, cultural and artistic perspectives can contribute to sustainability concepts. We presented results of the survey for research prioritization and the gap of the involvement of social scientists in the discourse in order to establish links to the subjects of cultural heritage and landscape planning.

A further workshop will be conducted June, 2, 2025 at which four invited speakers experienced in stakeholder interaction in the Danube basin will present their success stories and what they observe as major challenges in the communication. In collaboration with task 5.3 we will discuss the findings and analyze the parameters for success and failures. We will prepare a ranking for the identified parameters and discuss (a) how the pathways for success can be determined for capacity building and (b) how the repetition of failures can be prevented in future projects. Target of the workshop is dissemination material for outreach to various stakeholder groups.

We will further conduct a study on common cultural values of European rivers and migratory fish, as well as associated organisms. With this investment we want to explore common incentives for stakeholders to deliver arguments for

authorities and decision makers to invest in the preservation of the cultural heritage. Indicators for the restoration of rivers and the cultural heritage will be analyzed from a social and a natural science perspective in order to pluralize the interest groups for river restoration engagement.
Linkages with other support functions: • Capacity building and governance of topical networks
Summary of results: Initial contacts to social scientists and to experts for stakeholder interaction have been established. In the ongoing process we will analyze the stakeholder lists from the identified Horizon projects and offer further workshops to combine the knowledge from other subjects. Incentives for river and migrating fish habitat preservation and restoration will be the focus to establish recommendations for the mainstreaming of the BDS target to restore 25.000 km of free-flowing European rivers.

Success factors (detailed in Annex 6):	**Challenging factors (detailed in Annex 6):**
• High interest of various social scientists to collaborate on the subject of river connectivity, restoration and landscape planning. • Well established network for the dialogue to translate and transfer knowledge.	• Many EU member states in the Danube basin suffer from right winged political orientation and sometimes even anti-European views that can cause a barrier for joint investments into restoration. • Some obsolete river barriers are under complex political affiliations (e.g. no clear allocation of national authorities), making joint restoration projects for stakeholders difficult to realise. • Some of the member states in the Danube basin are suffering from corrupt authorities. Stakeholders are thus frustrated and will not engage in surveys and projects.

5.2. Urban NBS DC

The Urban NBS DC carried out a set of targeted activities to test and advance the SSBD's transformative potential. These were structured around three key support functions: (i) research prioritisation, (ii) feedback to policy frameworks, and (iii) building the evidence base.

The first group of activities (Activities C11 and C12) focused on identifying practice-oriented research priorities for urban nature planning. Through a Delphi survey targeting practitioners and the collection of insights from a major international conference, the DC gathered concrete inputs to define critical knowledge gaps for delivering ambitious Urban Nature Plans.

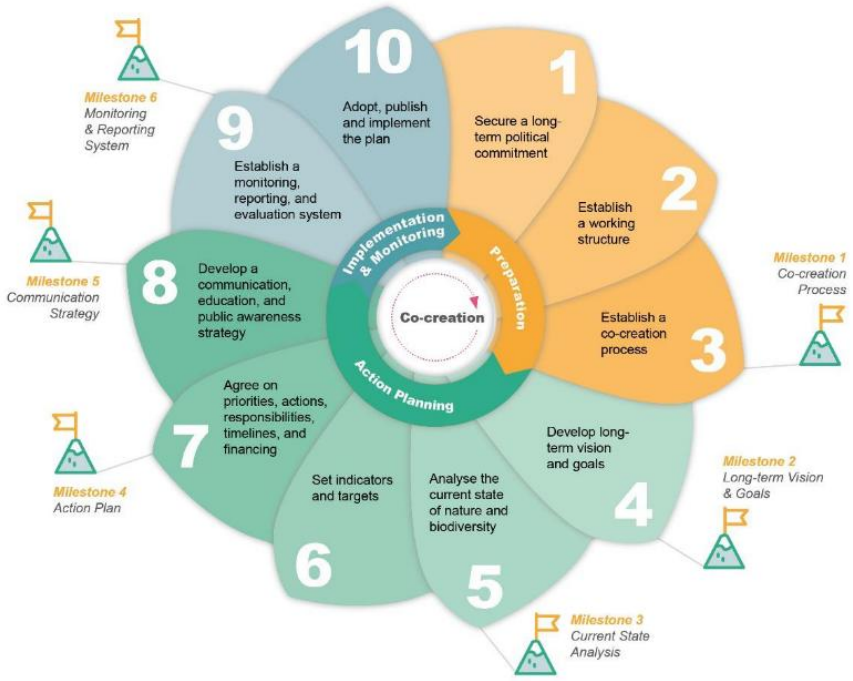
The second group of activities (Activities C13 and C14) aimed to provide structured feedback to policy frameworks. This included contributing comments on the draft typology of measures under the Nature Restoration Regulation (NRR) and engaging as observers in the EU Biodiversity Platform's working group on Green Infrastructure to stay informed on operational needs and emerging policy priorities.

A final activity (Activity C15) involved participating in the NetworkNature+ Task Force on data and knowledge sharing, strengthening the DC's contribution to the EU-wide evidence base on NBS.

Activity C11: Conducting a Delphi survey to elicit practitioners-led knowledge needs for ambitious Urban Nature Plans	
Main support function: Research prioritization	**WPs involved:** WP3
Objectives: This activity has twofold objectives. **From the SSBD perspective:** The activity aims to test the Delphi survey as a method for identifying and prioritizing research needs with local planners and policymakers— a category of actors identified in BioAgora D2.1 as a key for a fair, inclusive, and participatory SSBD.	

From a thematic perspective:
The activity aims to identify knowledge gaps in the technical content of Urban Greening Plans (now renamed into "Urban Nature Plans"), focusing on selected guidance steps where biodiversity-related information is most needed—such as developing long-term visions, analyzing the current state, and setting targets and ageing on priorities and actions (Figure 7)—to support the development of high-quality, ambitious plans. Details on the selected guidance steps can be found in https://environment.ec.europa.eu/topics/urban-environment/urban-nature-platform_en.

Figure 7: Process steps for drafting Urban Greening Plans (Extracted from European Commission 2022):



Method/approach: The Delphi technique involves an iterative process of gathering expert judgments through multiple rounds of anonymous surveys, where participants receive feedback on previous responses to refine their insights (Beiderbeck et al., 2021). The tested methodology follows the following stages:

- Defining objectives and designing the first-round questionnaire
- Selecting the expert panel
- Collecting and analyzing first-round responses
- Providing feedback to experts
- Preparing and analyzing the second-round questionnaire
- Providing final feedback on views around emerging issues.

The first round of the Delphi survey aimed to explore the technical and knowledge-related challenges associated with developing high-quality and ambitious Urban Greening Plans, specifically the five selected steps from the Guidance. The questionnaire (see Annex 5) was structured into two complementary sections. The first one gathered Experts' insights based on their broader professional experience in urban nature, and biodiversity planning. It included seven open-ended questions covering the five selected guidance steps. Experts were encouraged to reflect on challenges, good practices, and missing elements in current planning approaches. The second section included eight questions (both open- and closed-ended) asking respondents to draw directly on their experience in drafting or contributing to a recent Urban Greening Plan or similar instrument. Questions addressed the actual inclusion of relevant content—such as biodiversity and greenery indicators, accessibility considerations, climate mitigation/adaptation, and prioritization criteria—in existing plans. This allowed comparison between expert expectations and current planning practice. By combining general reflections with concrete plan-based input, the first-round questionnaire helped clarify the perceived requirements for ambitious Urban Greening Plans and the extent to which those requirements are currently

met in real-world planning. Results from this round laid the groundwork for deeper investigation in subsequent survey stages.

The panel included 10 local planners and policymakers from across Europe—Madrid, Amsterdam, Krakow, Lisbon, Bolzano, Malta, Glasgow, Bilbao, Lappeenranta, and Turku—ensuring both geographical and thematic diversity. All experts had been directly involved in drafting recent urban plans focused on nature, biodiversity, or greening. Plans were identified through a screening of policy instruments sourced from the Interlace Urban Governance Atlas and other EU initiatives such as the Green City Accord and Greening Cities Partnership. From an initial pool of 32 plans—covering biodiversity strategies, greening plans, and sectoral documents—experts were formally invited, and 10 agreed to participate. The final panel comprised both municipal staff and external consultants, offering a range of institutional perspectives.

The first round of consultations (See Annex 5) was launched in June 2024. To accommodate participants' availability over the summer period, the consultation remained open for two to three months. Responses were analyzed using the qualitative analysis software MAXQDA via deductive thematic coding, allowing for the identification of key themes, areas of consensus and divergence, and expert-suggested additions—particularly new targets and indicators not covered in the EU guidance. A synthesized summary of responses was then shared with the expert panel, along with the second-round questionnaire, to support reflection and refinement of views in line with the Delphi methodology.

Building on the outcomes of the first round, the second questionnaire (See Annex 5) focused on four thematic areas identified as priorities: biodiversity, ecosystem conditions, recreation and cultural ecosystem services, and climate change adaptation. Biodiversity covered the status and protection of species in urban areas, including native, vulnerable, non-mobile, and pollinator species. Ecosystem conditions addressed the health of green and blue infrastructure, with emphasis on spatial coverage, connectivity, vegetation and soil quality, and canopy cover. The theme of recreation and cultural ecosystem services explored the accessibility and distribution of green spaces, their role in supporting well-being, and their contribution to cultural and aesthetic values. Climate adaptation focused on enhancing urban resilience to risks such as flooding, heatwaves, and droughts. In addition, the questionnaire included five cross-cutting issues related to setting plan targets, prioritizing interventions, and aligning with other policy instruments. The questionnaire consisted of open-ended questions designed to capture detailed qualitative input. The second round took place between December 2024 and January 2025, with nine out of ten experts participating.

Summary of results:
This section presents insights from the two Delphi survey rounds on what defines an ambitious Urban Greening Plan (thematic-related objective). The findings were organized by guidance step and cover how current plans meet Experts recommendations, views on the four thematic areas (biodiversity, ecosystem conditions, recreation and cultural services, and climate adaptation), and related barriers. Results from the SSBD perspective are provided in the section on success and challenging factors.

Step 1 – Developing Long-Term Visions and Goals:
Experts emphasized that long-term visions in Urban Nature Plans should be locally grounded and oriented toward systemic change—such as halting biodiversity loss, enhancing ecological connectivity, and fostering nature-connected communities. Visions should integrate ecological and social goals, reflect local identity, anticipate future pressures, and be shaped through inclusive engagement and long-term policy and financial support.

However, selected plans only partially reflect these ambitions. While 78% refer to ecosystem services, one Expert described this inclusion as general and conceptual—indicating limited operational use of the ecosystem services framework. Environmental pressures were not addressed in 33% of plans, often due to a narrower scope (e.g., focus on climate adaptation).

There was strong consensus among Experts on the relevance of the four thematic areas. All nine Experts identified biodiversity as foundational, essential for resilience, service provision, and environmental quality. Some stressed the importance of aligning biodiversity objectives with local socio-economic realities. Six Experts underlined the value of ecosystem conditions, particularly for supporting biodiversity and ecosystem health. Seven Experts emphasized the importance of recreational and cultural ecosystem services, citing contributions to cohesion, heritage, health, education, equity, and local economies. Two Experts offered more cautious views—one considered them secondary to biodiversity, another said their relevance depends on local priorities. Climate adaptation was endorsed by eight Experts

as critical for long-term resilience, though one Expert felt it might be more appropriately addressed in dedicated planning instruments.

Barriers to integration were consistent across themes. Fragmented responsibilities and poor coordination were cited by six Experts for biodiversity and five for ecosystem conditions. Two Experts also noted bureaucratic complexity in incorporating recreational and cultural services. These structural issues often cause administrations to prioritize more conventional or politically safe objectives, sidelining biodiversity and ecosystem-related goals.

Knowledge and awareness gaps were another major constraint. Five Experts identified low awareness among decision-makers as limiting ambition in biodiversity, ecosystem conditions, and climate adaptation. In the latter case, two Experts noted poor understanding of climate dynamics and the role of nature-based solutions. For recreational and cultural services, three Experts pointed to widespread underestimation of their value, especially by planners and local officials.

Resource limitations—both financial and technical—were frequently mentioned. Four Experts cited insufficient funding for biodiversity integration, six for ecosystem conditions, and three each for climate adaptation and cultural services. Two Experts noted lack of staff capacity for biodiversity planning, while three raised the issue of limited training on climate topics.

Step 2 – Analyzing the current state of nature and biodiversity:
Experts emphasized that an effective Urban Nature Plan requires a robust, spatially explicit, and multi-dimensional baseline. Biodiversity and ecosystem conditions were identified as foundational, with key indicators including habitat extent and connectivity, species richness (especially pollinators and endangered species), and tree canopy cover. These metrics are essential for establishing a reference state and assessing progress, such as toward Biodiversity Net Gain. Experts also stressed the inclusion of ecosystem services—such as stormwater retention, air quality, urban cooling, and recreation—alongside accessibility, social equity, and climate resilience. Scenario-based climate assessments and integration of GIS tools were recommended to ensure context-specific, measurable planning.

Selected plans showed partial alignment with these expectations. Land use and green space typologies were commonly addressed, though not always in detail. Biodiversity was included in most plans, particularly for birds and pollinators, but sometimes sourced from separate documents or omitted in climate-focused plans. Accessibility was also frequently covered, though often using external datasets. In contrast, climate-related risks, pollution, and environmental pressures were inconsistently included—despite being considered critical by Experts for adaptive and integrated planning.

In the second Delphi round, Experts reviewed the comprehensiveness of the proposed indicators (from both Round 1 and the EU Guidance). Strong consensus emerged for biodiversity indicators, with seven Experts confirming sufficiency and recommending gradual expansion where needed. For ecosystem conditions, agreement was weaker—only two Experts viewed the list as complete. Others noted missing indicators, such as for fauna, invasive species, and water/soil quality. On recreation and cultural services, three Experts endorsed the indicator set, while others proposed refinements including visit frequency, proximity thresholds, and aesthetic dimensions. Climate adaptation showed the largest gap: all Experts agreed the indicators were insufficient. They proposed new metrics on thermal comfort, shade, carbon storage, flood risk, and pollution, with a clear call for locally tailored approaches.

Challenges affecting indicator use were also highlighted. Data availability was the most common barrier, noted across all four themes. Four Experts reported fragmented or outdated data for biodiversity and ecosystem conditions; similar concerns were raised for climate adaptation. Recreation and cultural data were less problematic but still time-consuming to collect. Cost was another key issue: three Experts cited the high financial and technical burden of biodiversity and ecosystem monitoring, with suggestions to use simplified proxies where possible. Conceptual and methodological issues were especially noted for recreation and ecosystem condition indicators. Experts called for clearer definitions, warned about inconsistencies in monitoring over time, and raised concerns about the dynamic nature of some ecological variables. For climate adaptation, one Expert stressed the need for interdepartmental coordination, noting that governance fragmentation often hinders effective indicator implementation.

Step 3 - Setting indicators and targets:

Experts emphasized that ambitious Urban Nature Plans should include diverse and measurable targets, with a strong focus on biodiversity and habitat-related outcomes. Priorities included reversing ecological degradation, enhancing connectivity, reducing invasive species, creating new habitats, and expanding protected areas. Other proposed targets

addressed climate mitigation, public health, green-blue infrastructure, green space accessibility, and water management. While most Experts supported integrating environmental quality targets, a divergence emerged: some viewed these as essential, while others argued they are better addressed through separate planning instruments—highlighting the need to clarify the scope of Urban Nature Plans within broader policy frameworks.

Selected plans show an uneven approach to target-setting. Core biodiversity-related targets—such as habitat quality, protection, and accessibility—were frequently included and align well with Expert expectations. However, other relevant targets (e.g., tree canopy cover, greening efforts, and pollution control) were inconsistently applied, often vaguely defined or addressed in external documents. This fragmentation indicates a disconnect between Expert recommendations and planning practice, particularly in setting concrete, actionable goals beyond traditional habitat metrics.

While there was broad support among Experts for including targets like tree canopy cover, tree planting, and climate adaptation, several caveats were raised. Concerns included the need to track tree survival rather than planting alone, challenges in setting locally appropriate thresholds, and limited data availability. One Expert questioned whether adaptation goals should be embedded in Urban Nature Plans or tackled through separate instruments. Overall, these responses underscore the importance of target specificity, local contextualization, and integration across planning domains.

Experts expressed differing views on how Urban Nature Plans should relate to existing planning instruments. Three Experts preferred a standalone plan to enable clearer alignment with national strategies and direct implementation. Two favored treating the UNP as a composition of measures drawn from various existing plans, promoting broader integration across policy areas. One Expert recommended embedding the UNP within the city's masterplan.

Step 4 - Agreeing on priorities and actions:

Experts agreed that interventions in Urban Nature Plans should be primarily guided by ecological criteria—such as the current state of biodiversity, ecosystem conditions, and the potential to improve habitat quality, connectivity, and species diversity. For restoration and greening, underused or degraded areas—particularly those lacking green space or facing environmental stressors—were identified as priority zones. Social aspects like accessibility, equity, and community needs were also considered essential, alongside criteria such as feasibility, long-term sustainability, and cost-effectiveness.

Eight Experts emphasized the need to assess the cost-effectiveness of interventions to ensure efficient resource use. However, two Experts advocated for a broader evaluation approach, stressing that monetary costs alone do not reflect the full ecological and social value of interventions. This highlights general agreement on the importance of cost considerations, coupled with calls to include non-economic dimensions such as health, cultural value, and climate resilience.

Despite strong support for ecological restoration among Experts, it remains underprioritized in current planning practice. Based on Expert responses, greening interventions were most frequently prioritized in selected plans, followed by conservation actions. Restoration ranked lowest, with 56% of Experts reporting it as the least emphasized category. This contrasts with broad Expert consensus on the role of Urban Nature Plans for restoration: eight Experts supported a stronger focus on restoration, with four linking it directly to strategic goal-setting and integrated intervention planning. Restoration was seen as essential for biodiversity, public health, and climate adaptation. Some noted that restoration's priority may depend on the city context, but overall, the findings point to a need for clearer integration of restoration in urban nature strategies and better alignment across planning instruments.

Linkages with other support functions:

- Answering urgent requests: This activity informed the pre-scoping dialogues with DG ENV for identifying suitable topic for a request.
- Activating topical network: The activity expanded the practitioners category of the NBS network, including contacts with local planners and municipalities.

Main success factors (detailed in Annex 6):	**Main challenging factors (detailed in Annex 6):**
• Consensus on key themes for ambitious plans. • Strengthening Practitioner Networks. • Expanding Delphi as a support tool for bridging policy and practice.	• Ambiguity in gap typology. • Challenges in gap analysis. • Sustaining expert participation in time-intensive processes.

• Indicator development. • Improving gap classification by Experts.	• Limited reach beyond EU project circles. • Outdated or incomplete contact data. • Overloaded municipal agendas.

Annex: Questionnaires for the Delphi survey (Annex 5).

References:

Beiderbeck, Daniel, Nicolas Frevel, Heiko A. von der Gracht, Sascha L. Schmidt, and Vera M. Schweitzer. 2021. "Preparing, Conducting, and Analyzing Delphi Surveys: Cross-Disciplinary Practices, New Directions, and Advancements." MethodsX 8: 101401. https://doi.org/10.1016/j.mex.2021.101401.

European Commission. 2022. "Urban Greening Plans: Guidance for Cities to Help Prepare an Urban Greening Plan."

Activity C12: Collecting insights from the ESP Conference on technical contents of Urban Nature Plans.

Main support function: Research prioritization	**WPs involved:** WP1

Objective:

The objective was to support other activities of the urban NBS DC by collecting insights into the latest advancements on the topics addressed in Activity C11 (Delphi survey). Additional goals were:

- contributing to expanding the topical network by getting in touch with experts involved in projects and institutions not yet identified;
- disseminating BioAgora approach and results to a potentially relevant audience.

Method/approach:

A session titled "Assessing ecosystem conditions, services, and biodiversity in Urban Nature Plans: targets, methods, and indicators" was organized at the 5th ESP Europe Conference "Ecosystem Services: One Planet, One Health", held in Wageningen from the 18th to the 22nd of November 2024. ESP is the acronym of Ecosystem Service Partnership, a network that connects over 3000 ecosystem services scientists, policy makers and practitioners who work together in more than 40 Working Groups and a growing number of National Networks on all continents. ESP regularly organises World and Regional conferences and provides many services to further enhance the application of ecosystem services for nature conservation, ecosystem restoration and sustainable management.

The session was organized within the framework of the "urban biomes" working group. The general aim stated in the call for abstracts was to stimulate the debate around the technical aspects of drafting "Urban Nature Plans" (UNP) and specifically to identify suitable methods and indicators that local authorities can adopt to assess urban ecosystem conditions, services, and biodiversity in UNP planning processes.

The call for abstracts included an explicit reference to BioAgora and the role of the urban NBS DC of testing the future functions of the SSBD.

Summary of results:

The session, held on November 19, 2024, featured 10 presentations with topics spanning from the analysis of the current conditions on EU cities with respect to planning targets such as the 3-30-300 rule, to approaches for the prioritization of nature-based solutions, to methods for monitoring urban biodiversity and ecosystem services.

Overall, the insights collected from the presentations revealed innovative methods that could be applied to support the drafting of UNPs, as well as existing gaps and limitations that still need to be addressed. These reflections partly drove the preparation of the questions for the second round of the Delphi survey (Activity C11). Information gathered from the session was also useful in supporting the discussion around Request N.7 on urban greening planning tools, especially during the pre-submission dialogue.

Linkages with other support functions:

- Activating topical networks: This activity contributed to the mapping of actors relevant to urban NBS, helping to identify key stakeholders for potential engagement in topical networks.
- Answering urgent requests: Indirectly, knowledge gathered from the session supported the pre-submission dialogue on Request N.7.

Main success factors (detailed in Annex 6):	Main challenging factors:
• Insights from ongoing projects, included those not funded by the EU. • Possibility of reaching relevant experts outside the main NBS-related networks. • Focused discussion on topical issues.	Not found

Activity C13: Providing feedback to the NRR implementation strategy document on the draft typology of measures related to urban habitats	
Main support function: Feedback to policy frameworks	**WPs involved:** WP1
Objective: The activity seized a window of opportunity for providing feedback to the draft typology of measures included in the implementation strategy of the NRR.	
Method/approach: Since the feedback was required on a short notice, DC leads replied based on their experience on the topic and on the knowledge collected from the network through other activities. Suggestions made by the urban NBS DC were then combined with feedback from other DCs and submitted by the BioAgora observers in the EUBP working group on the Nature Restoration Regulation.	
Summary of results: Feedback by the urban NBS DC focused on measures related to urban habitats. Suggestions included both refocusing some of the measures to better capture specific types of interventions and modifying the descriptions to make it clearer how they could be monitored. The draft also included a generic measure on NBS, which should be further detailed and possibly divided into measures focused on specific NBS.	
Linkages with other support functions: No direct link was found with other support functions.	
Main success factors: • BioAgora was able to provide quick feedback by gathering input from the different DCs.	**Main challenging factors:** • Due to the very short time frame, mobilizing the network was not possible (missed opportunity).

Activity C14: Participating as observers in the EUBP working group on Green Infrastructure	
Main support function: Feedback to policy frameworks	**WPs involved:** WP1
Objective: The main goal of this activity is to ensure linkages between the future SSBD for Biodiversity and policy relevant discussions ongoing in the EUBP working groups. Ideally, this should guarantee that emerging needs at the science-policy-society interface are identified early on, thus anticipating future knowledge requests. EUBP working groups also offer the opportunity to showcase results of the SSBD (including but not limited to the outputs produced by the answering request processes) to a relevant audience, providing feedback to policy frameworks at both the EU and national scales. Given the topic, a representative of the Urban NBS DC was assigned as observer to the EUBP working group on Green Infrastructure, which focuses on the implementation of the EU Green Infrastructure Strategy (COM/2013/0249) and on the provisions of the EU Biodiversity Strategy for 2030 (COM(2020) 380) related to ecological corridors and to green infrastructure and nature-based solutions in urban areas.	
Method/approach: During the time frame covered by this deliverable, the working group met three times: March 7, 2024; January 23, 2025; and March 13, 2025. The first meeting in March 2024 was the kick off of the renewed working group and the members were invited to make proposals for the working plan.	
Summary of results: Discussions within the working group focused on highly-relevant topics for the DC, contributing to frame DC activities in the current policy debate. In particular, the two last meetings in 2025 centered on Article 8 of the Nature Restoration Regulation, which was identified as a priority topic by the working group members. The discussion	

revolved around monitoring and reporting mechanisms related to the targets for urban areas, highlighting unsolved issues and knowledge needs from Member States.	
Linkages with other support functions: • Horizon scanning • Research prioritization	
Main success factors: • Participating in the working groups allows keeping track not only of higher-level policy debates (i.e., issues discussed in general EUBP meetings) but also of the practical knowledge needs related to the implementation of specific policies (e.g., monitoring and reporting mechanisms).	**Main challenging factors:** • Priority topics of the working group might not always align with relevant activities conducted by the SSBD, which might lead to conflicts in the agenda if working groups are identified as potential audiences for the SSBD results. A stronger coordination with the working group leaders - beyond the simple participation as observers - is required for the SSBD to seize all the opportunities offered by these platforms.

Activity C15: Joining NetworkNature+ Task Force 1 on data and knowledge sharing	
Main support function: Building the evidence base	**WPs involved:** WP1 and WP4
Objective: The aim of this activity was to link up with other relevant initiatives and attempts to build an evidence base on DC-related topics. Among the Task Forces set up by NetworkNature+, Task Force 1 (TF1) focuses on advancing data and knowledge sharing on NBS. Among its objectives are: i) to facilitate the development of data standards for priority NbS indicators, ii) to assist the EU Repository of NbS (Oppla) by supporting ongoing development of a shared case study template and API, iii) to help to increase the skills and capacity of NbS projects in relation to data and knowledge sharing, and iv) to collaborate with BioAgora and other projects in helping to meet EU policy needs for data on NbS and biodiversity. Participation in TF1 meetings was therefore a way to keep the DC leads updated on ongoing developments and to learn from this experience as a model that could be replicated in other Horizon clusters and beyond.	
Method/approach: A representative of DC leads joined the online meetings of TF1 during the period covered by this deliverable and reported back to the DC about the ongoing activities.	
Summary of results: Participation in the task force can be seen as an indirect testing of the future SSBD function of "building the evidence base". The function is being performed by the TF with a specific focus on the topic of NBS and as part of a broader strategy of coordinating Horizon projects on NBS through NN+. From the perspective of "building the evidence base", the TF is working on two main lines of activities. The first one is dedicated to data standards for reporting priority indicators of NBS impacts. This activity builds on previous results from another NN+ task force (TF2), which developed a handbook on "Evaluating the impacts of nature-based solutions". The handbook features a collection of indicators to be used by EU-funded projects to report on the impacts of NBS. TF1 is now selecting among those indicators some priority ones for which to develop data standards that would allow a homogeneous reporting of impacts across cases. The second activity focuses on improving the documentation of NBS case studies, already showcased in Oppla, by creating a shared template and API. This again builds on long-term efforts in developing and maintaining Oppla as a platform for sharing knowledge (in many different formats) produced by EU-funded projects.	
Linkages with other support functions: No direct link was found with other support functions.	
Main success factors: • Long-term commitment of the EC is needed for the success of activities aimed at building an evidence base.	**Main challenging factors:** • Part of the success of NN+ activities is due to the relatively limited thematic focus and clear objectives. Replicating the same approach for broader topics (e.g., biodiversity) and more

• EU-funded projects were explicitly required to contribute to the clustering activities of NN+. • TF1 activities build on existing outputs (e.g., the handbook) and platforms (i.e., Oppla) and respond to needs that are perceived as relevant by both the EC and the project partners. • The activities lead to tangible outputs, which boost interest and engagement.	general objectives (e.g., building an evidence base) is more challenging. • Ensuring long-term participation engaging new contributors through time requires flexibility in adapting activities and modes of collaboration to changing interests and needs.

6. Lessons learned and recommendations for developing the SSBD

Building on the experience of the T1.2 DCs in the last three years, this section presents lessons learned and recommendations to guide the future activities of the KENs (including those being developed under Task 1.3, and more generally the development of the SSBD. These lessons and recommendations have been discussed and shared within the consortium in different forms and ways as soon as they emerged, and they contributed to shape relevant activities within BioAgora over the first 36 months. Lessons are divided between those concerning the conceptual development of the SSBD, (Section 6.1), and those related to its operational implementation (Section 6.2). This section is based on the analysis and synthesis of the outcomes of SWOT analyses that were conducted separately for each DC and each function (see Annex 6) and were discussed during the joint meetings of the DC leaders.

6.1. Lessons and recommendations for conceptual SSBD development

The testing of the SSBD framework revealed that its functions are best implemented through a stepwise and adaptive approach, rather than as parallel, standalone activities. In practice, demonstration cases often began with functions like *Linking with Biodiversity Policy and Strategies* and *Activating Topical Networks*, which served as enabling processes that created the conditions for subsequent activities.

More resource-intensive or complex functions—such as *Answering Requests*, *Research Prioritisation*, and *Feedback to Policy Frameworks*—typically emerged later and built upon the groundwork laid by earlier phases. This sequencing points to a functional hierarchy within the SSBD: some functions act as core structural components, others as enabling processes, and still others as integrative outcomes.

For example, *Answering Requests* depends on the coordinated activation of several other functions and is best understood as an integrative process rather than a discrete step. Similarly, *Feedback to Policy Frameworks* consistently appeared as a cumulative result of upstream activities, including stakeholder engagement and knowledge production.

Capacity Building and Governance was observed to operate not as an isolated function, but as a mode of working embedded across multiple processes—from workshop facilitation to request delivery and network coordination.

These insights suggested the need to refine the functional vocabulary of the SSBD to better reflect how functions unfold in practice. Distinguishing between structural, enabling, and integrative roles can help guide implementation and support more coherent and scalable science–policy interfaces.

6.1.1. Interconnections between SSBD functions

The SSBD functions are not stand-alone mechanisms but operate in interconnected, iterative, bidirectional ways, where progress in one area enables or amplifies action in others. Several types of interlinkages were consistently observed across DCs.

From Linking with Biodiversity Policies and Strategies to Activating Topical Networks:

The linkage between *Linking with Biodiversity Policies and Strategies* and *Activating Topical Networks* emerged clearly in all demonstration cases. Policy objectives provided strategic direction, enabling the targeted identification and activation of topical networks. In the Urban NBS DC, for instance, the contribution to EU Biodiversity Strategy 2030 targets (14 and 9) helped define network boundaries and focus. Similarly, the

Pollination DC mobilized its topical network explicitly around policy-defined needs from the EU Pollinators Initiative, such as the identification of Key Pollinator Areas and developing an Integrated Assessment Framework. Thus, policy alignment significantly influenced the thematic focus and actor composition of the activated networks.

From Activating Topical Networks to multiple functions

The activation of topical networks plays a critical enabling role in the overall functioning of the SSBD. These networks serve as the infrastructure through which knowledge circulates, capacities are built, and legitimacy is maintained. Establishing, expanding, and sustaining topical networks is often a necessary precursor to operationalising other functions.

Once topical networks were activated, they became crucial spaces for capacity building and governance activities. In the Urban NBS DC, interactions with NetworkNature+ highlighted the necessity for governance frameworks to manage and sustain these networks beyond initial EU project participation. The Freshwater DC similarly demonstrated this through the establishment of the European Rivers Cluster, a forum that fostered collaborative governance, capacity-building workshops, and co-authored guidance on river restoration. These examples underscore the importance of topical networks as platforms not just for interaction, but also for deeper institutional learning, skill development, and collaborative governance.

Activating Topical Networks significantly supports the SSBD function of *Answering Requests* by mobilizing relevant actors who hold critical expertise and context-specific knowledge necessary for informed responses. For example, the Urban NBS DC mapped stakeholders within and beyond NetworkNature+, identifying key experts who later contributed directly to the urgent policy request on urban greening tools (Request 7), ensuring rapid mobilization of appropriate expertise and comprehensive, relevant input.

Through its observer role in NetworkNature+ Task Force 1, the Urban NBS DC recognised that building a robust and integrated evidence base requires structured, ongoing collaboration facilitated by an active topical network. This insight underscores the necessity for topical networks to be intentionally designed and maintained to foster long-term, collaborative relationships among diverse stakeholders.

Activated topical networks provide crucial platforms for consolidating knowledge into policy-relevant formats, directly supporting the SSBD's *Policy Feedback* function. For instance, the Pollination DC leveraged its activated topical network to inform the "Buzzing Table" workshop, which facilitated direct stakeholder interaction, ensuring practical, policy-informed outcomes. These results were then actively disseminated to EU policy groups, including DG ENV and DG AGRI, providing targeted and timely feedback on pollinator-related policies.

From Activating Topical Networks and Linking with Biodiversity Policies and Strategies to Research Prioritisation

Network activation and policy linkage both played pivotal roles in shaping research priorities. In the Urban NBS DC, for example, the Delphi survey identified practitioner-led knowledge needs aligned with policy goals for Urban Nature Plans. The direct engagement of local planners and practitioners—key network actors—allowed for targeted, policy-relevant research prioritization. Meanwhile, in the Pollination DC, the expert elicitation explicitly highlighted knowledge gaps to inform future research priorities aligned with the EU Pollinators Initiative.

From Research Prioritisation to Answering Requests

In some cases, research prioritisation activities helped shape the focus and scope of policy requests. In the Urban NBS DC, insights from a Delphi survey contributed to defining the thematic direction of Request N.7 on planning tools for urban greening. In the Pollination DC, although no dedicated research prioritisation activity was conducted, the Delphi expert elicitation (Activity A1) may reveal knowledge gaps that could inform future requests.

From Answering Requests to Feedback to Policy Frameworks

Answering policy requests not only supported immediate decision-making but also, in some cases, contributed to broader policy dialogue. In the Pollination DC, insights from the expert elicitation and stakeholder workshop were shared with DG ENV, DG AGRI, and others, and presented at the 2024 European Week of Regions and Cities—serving both as a policy input and a feedback mechanism to the EU Pollinators Initiative.

6.1.1. Gaps in testing functions

Functions differ in the level of effort and resources required. Not all functions can be tested with the same intensity or investment. Some functions, like mapping networks or linking with policy strategies, can be engaged with relatively low initial effort and are exploratory in nature. Others—such as *Capacity Building*, *Research Prioritisation*, or *Answering Requests*—require more sustained coordination, methodological support, and involvement of external stakeholders.

The function of *Supporting and Monitoring Biodiversity Mainstreaming* and *Horizon Scanning* were only addressed in the Freshwater DC (Activity B12), leaving its applicability untested in the other DCs. *Research Prioritisation* was not piloted in the Pollination DC, with only a potential for indirect contributions expected through the Delphi expert elicitation for *Answering Requests* (Activity A1), without a specifically defined prioritisation process. The function *Building the Evidence Base* was not tested across the Pollination and Freshwater DCs, with only limited contributions from the Urban NBS DC. The Pollination and Freshwater DCs did not report any activities explicitly aimed at building or curating an evidence base, despite generating knowledge outputs through other functions such as answering requests and feedback to policy frameworks.

Some activities contributed to the testing of a function only marginally, often through observation or limited participation rather than active implementation. The NBS DC joined NetworkNature+ Task Force 1 as an observer (Activity C15), without direct impact on operationalizing Building the Evidence Base function. While this offered valuable insights into the importance of structured collaboration for evidence integration, the DC did not directly contribute to or lead any data harmonisation or repository-building work. Also, the DC serves as reviewers for an Eklipse report (Activity C1 for answering in-depth requests), which, while relevant, did not entail a full in-depth request process (e.g., no SSBD ticketing, scoping, or synthesis phases). Hence, its impact on testing the full process was limited.

Certain functions were implicitly addressed but not as the focus of targeted piloting activities. *Capacity building* in the Pollination DC was not addressed through any specific activities, even though it may have occurred informally through stakeholder interactions during Activity A2. This highlights a missed opportunity to explicitly test capacity-building activities aimed at strengthening governance structures and processes. In both Pollination and Urban NBS DCs, *Feedback to Policy Frameworks* was partially addressed, but often by sharing outputs developed for other purposes (e.g., the Buzzing Table report or green roof guide) rather than through dedicated feedback mechanisms structured for that function.

In some cases, single activities—such as workshops or literature reviews—were linked to multiple functions (e.g. linking with policy and activating networks), but without a clear explanation of how these functions were connected. This highlights the need to design activities in a way that makes the relationships between functions more explicit, rather than treating them as separate or overlapping tasks.

6.2. Lessons and recommendations for SSBD practical implementation

This section presents key operational lessons for the future SSBD, most of them aligning with the development of other BioAgora tasks. Additional recommendations are expected to emerge from the continued experience of DCs in responding to multiple DG ENV Requests. To support this, the Task, in collaboration with the Task Force on Answering Requests has implemented a monitoring system—including logbooks, evaluation surveys for experts and focal points, and detailed meeting minutes—to track ongoing processes and capture lessons learned upon

their completion. These future insights will be included in Deliverable D4.2: *Functional design report of the future science service, including adequate ethical infrastructure*.

6.2.1. Operational and coordination capacity

Experiences across DCs underscored the critical role of operational capacity—both internal and external—in ensuring the effective delivery of responses to policy requests and the maintenance of long-term collaborations within networks. While several DCs demonstrated strong initial engagement and synergies with ongoing initiatives, these strengths were often offset by significant resource and coordination challenges.

The ability to manage complex answering processes was constrained by limited staffing, and high administrative burden. Focal points played an essential role in facilitating expert engagement, liaising with requesters, coordinating outputs, and supporting co-chairs, yet this function lacked sustained institutional support, recognition, and integration into long-term SSBD structures. Time-intensive processes such as expert elicitation, data validation, and iterative consultations were frequently managed by a small number of individuals, often without junior support, slowing delivery.

Maintaining and leveraging strategic synergies with EU-funded networks required sustained coordination, yet this was often hindered by the absence of formalized collaboration mechanisms and clear governance structures. In many cases, cooperation among key actors lacked the continuity and joint decision-making processes needed to align priorities, coordinate resources, and prevent duplication of efforts. Coordination across diverse communities—such as science, policy, and civil society—was often time-consuming and dependent on personal connections rather than structured, institutional channels. This reliance on informal networks reduced the overall transparency, efficiency, and scalability of collaboration, and posed challenges for sustaining long-term networks.

The following actions are recommended and linked to the Task forces of answering requests and knowledge Agora for networks, the BioAgora WebPlatform, the Business Plan development and governance structure of the future SSBD:

- Institutionalize and adequately resource key internal roles—such as focal points and coordination staff—by establishing long-term support structures that ensure continuity, reduce over-reliance on individuals, and provide mechanisms for onboarding, task-sharing, and quality control.
- Develop internal operational guidance and planning tools to guide expert engagement, data workflows, and multi-actor consultations, and to ensure that capacity planning is integrated from the outset of each request.
- Strengthen coordination with EU initiatives and networks by formalizing collaboration mechanisms—such as shared agenda-setting, common evaluation criteria, and regular alignment meetings—to ensure continuity, reduce reliance on informal relationships, and avoid duplication of efforts.
- Invest in digital infrastructure—such as centralized expert databases and collaboration platforms—to improve expert identification, resource sharing, and continuous communication across requests and networks.

6.2.2. Stakeholder engagement and inclusion

A consistent strength across the DCs was the successful mobilization of expert contributions through existing professional networks and collaborations. Personalized, clearly framed invitations—emphasizing policy relevance and scientific value—were key to securing timely and meaningful engagement. Early outreach, the credibility of focal points, and flexible peer-recommendation methods (such as snowballing) further enhanced responsiveness, especially under tight deadlines.

Equally important was the emphasis on inclusive co-creation. Activities that brought together actors across disciplines, sectors, and governance levels produced outputs that were more trusted, actionable, and grounded in real-world needs. Diversity was understood not only in demographic terms but also as the integration of different

knowledge types—scientific, practical, and policy—which helped bridge fragmented communities and improve the legitimacy and uptake of results.

However, several DCs also exposed structural weaknesses in stakeholder engagement and network composition. Sustaining participation over time proved challenging due to high time demands, limited incentives, and a lack of structured follow-up. This was particularly evident among local practitioners and new stakeholders unfamiliar with BioAgora. Cold outreach—such as contacting EU project coordinators or private-sector actors—often yielded low response rates. Moreover, business, finance, grassroots groups, and dissenting voices were often underrepresented or absent.

These findings highlight a key challenge for the future SSBD and KENs: while professional networks are effective in mobilizing experts, they must be complemented by intentional strategies to ensure balanced and lasting inclusion. Achieving a representative stakeholder base requires clearly defined diversity goals that are tailored to the purpose of each activity or policy request. These goals should address demographic attributes (e.g., gender, geographic origin, career stage), sectoral representation (e.g., research, policy, business, civil society), types of knowledge (e.g., scientific, technical, practical, etc.), and levels of governance (local, national, EU). Meeting these goals requires proactive outreach strategies, sustained institutional support, and structured mechanisms to identify, engage, and retain contributors across all relevant sectors and governance levels. Without this, future KENs risks reinforcing existing silos and limiting the relevance and legitimacy of its outputs.

Importantly, diversity—particularly in terms of disciplines and knowledge domains— should be conceived as a strategic choice aligned with the specific scope and needs of each EC request or SSBD activity. While many policy questions benefit from a multidimensional perspective, others may be best addressed through more focused expertise. Thus, the SSBD should adopt a flexible approach to multidisciplinarity: promoting it where it adds value while ensuring relevance and efficiency in more specialized contexts.

The following actions are recommended and linked to the ongoing work around the Business Plan development, BioAgora WebPlatform, and governance structure of the future SSBD:

- Leverage existing networks and collaborations to efficiently recruit relevant experts, especially for time-sensitive requests.
- Use clear, tailored invitations that highlight the policy relevance and benefits of participation for different stakeholder types.
- Enable flexible peer-recommendation approaches (e.g. snowballing) to identify additional qualified experts across domains.
- Move beyond ad hoc, relationship-based recruitment by institutionalizing inclusive outreach methods that reduce bias and improve transparency.
- Develop and maintain curated stakeholder databases that reflect disciplinary, sectoral, geographic, and institutional diversity, including underrepresented groups such as business, finance, grassroots, and dissenting voices.
- Set and monitor tailored diversity goals for each KEN activity to ensure balanced inclusion of relevant knowledge types, sectors, and governance levels, in line with the specific purpose of each request or task.
- Offer clear and meaningful incentives (e.g. co-authorship, visibility, policy impact, contribution to project deliverables) to foster sustained engagement.
- Ensure continuous engagement through regular communication, feedback loops, and recognition of contributors' efforts.
- Implement hybrid participation formats (online and in-person) to increase accessibility and accommodate varying availability and resources.
- Design and support KENs that intentionally integrate science, policy, practice, and civil society perspectives.
- Build long-term institutional support structures to coordinate stakeholder engagement, follow up with contributors, and manage engagement beyond individual projects or requests.

6.2.3. Methodological innovation for engagement and learning

Across the DCs, innovative participatory methods—such as interactive gaming tools, role-play simulations, and structured learning frameworks— proved highly effective in engaging stakeholders and facilitating meaningful dialogue on complex challenges. These approaches enabled participants to explore diverse perspectives, reflect critically on assumptions, and contribute to knowledge co-production in ways that traditional formats often do not support. Beyond fostering engagement, these methods also generated structured outputs—such as prioritized stakeholder feedback, capacity needs assessments, and actionable policy insights—that increased both the analytical depth and practical relevance.

These tools were especially valuable in resource-constrained contexts, enabling impactful engagement without the need for large-scale events. Moreover, they supported horizontal learning and helped build trust, legitimacy, and shared ownership over outcomes. For the SSBD, embedding such methodologies systematically across functions can support not only inclusive participation, but also strategic learning, adaptive governance, and more grounded, evidence-based decision-making.

The following actions are recommended and linked to the BioAgora capacity building in Work Package 5:

- Adopt interactive formats as standard practice to foster engagement, support learning, and surface policy-relevant insights.
- Create a curated set of documented methods with clear guidance on when and how to apply them, drawing on successful examples from DCs.
- Train focal points and facilitators in participatory design, inclusive moderation, and reflective evaluation to ensure high-quality implementation and continuous improvement.

6.2.4. Translating science into policy-relevant outputs

Another key driver of effectiveness across the DCs was the close alignment of activities with existing EU policy frameworks and priorities. By structuring work around specific instruments—such as the Nature Restoration Law and the EU Biodiversity Strategy for 2030—and involving policy experts from the outset, the DCs ensured terminological clarity and policy relevance. This approach also enabled the transformation of research findings into actionable guidance and supported timely contributions to ongoing policy development.

At the same time, a significant challenge emerged in translating complex scientific knowledge—particularly ecological and technical insights—into outputs that are accessible and usable by non-specialist audiences, including policymakers and practitioners. This translation required balancing scientific rigour with clarity and brevity, especially when producing outputs like policy briefs or executive summaries. Key difficulties included the risk of oversimplification, the potential loss of nuance, and the need for extensive editorial work to maintain consistency across contributors.

In several DCs, producing policy-relevant outputs required intensive coordination among ecologists, social scientists, practitioners, and policymakers. While this collaborative drafting process enhanced the usability and legitimacy of the outputs, it also demanded substantial time and iterative revisions. Additionally, feedback loops were not always well-structured, expert availability was uneven, and editorial responsibilities often concentrated on a small number of contributors—creating bottlenecks and delaying delivery.

The following actions are recommended and linked to existing activities in Work Packages 4, 5 and 7:

- Structure co-authorship between scientists and policy experts to ensure outputs are technically sound, aligned with EU policy terminology, and practically applicable.
- Involve policy experts in co-creation processes to maintain consistency with regulatory frameworks and real-world implementation needs.
- Participate in relevant EU working groups to anticipate evolving policy priorities and ensure alignment with institutional agendas.
- Develop standard templates and formatting guidelines for policy briefs, executive summaries, and visuals to support clarity, brevity, and usability.

- Use clear, visual formats (e.g. diagrams, matrices, infographics) to make complex findings more accessible to non-technical audiences.
- Align outputs with established initiatives to boost visibility, avoid duplication, and ensure long-term integration.
- Provide editorial and methodological training, especially for early-career researchers and focal points, to strengthen internal science-policy communication capacity.
- Offer short guidance sessions for contributors on writing for policy audiences and collaborating in interdisciplinary teams.
- Embed dissemination planning from the outset, ensuring that outputs meet the needs of all stakeholder groups involved, including academic and practitioner audiences.
- Engage consistently in high-level policy forums and use multiple dissemination channels to broaden reach and policy impact.

7. Conclusions and next steps

This deliverable presents the results of the first testing experience of the SSBD conducted through the Pollination, Freshwater, Urban NBS, and Marine Biodiversity DCs. The testing confirmed the relevance of the SSBD functions framework and demonstrated its operational feasibility across diverse biodiversity domains and policy contexts. DCs effectively mobilised expert knowledge, supported real policy processes, and generated valuable lessons for future implementation.

Looking ahead, the findings of this deliverable will be updated with the insights from three additional requests currently being addressed. These insights will be included in the deliverable of Work Package 4, and will further validate and expand the lessons and recommendations presented here. This deliverable contributes to several BioAgora work packages and tasks. It provides actionable recommendations and strategic insights to Task 1.3, particularly to support planning and implementation of piloting activities, while highlighting effective methods and identifying operational gaps. It also compiles a comprehensive list of relevant organisations, networks, and EU-funded projects directly supporting Work Package 2 and the activities of the BioAgora Knowledge Agora Task Force.

It offers practical feedback on the Task 2.3 Assessment Framework, with additional relevance for the Answering Requests Task Force and the Ethical Infrastructure (Work Package 4). These insights can help translate high-level transformative concepts into operational questions for pre-submission dialogues of knowledge requests. By testing the knowledge overview model for urgent requests, the deliverable also identifies how each step functions in practice, where bottlenecks may occur, and what resources are needed to improve performance.

The deliverable also operationalizes methodological proposals from Task 3.3 by applying them in real-case exercises, providing practical insights into how to ensure inclusive representation in prioritisation and horizon scanning processes. It contributes to Work Package 5 by identifying capacity-building needs and testing collaborative engagement methods across three thematic domains. Lastly, it informs Work Package 4 by offering grounded input into the ongoing development of the SSBD's conceptual framework, governance structure, and long-term business model. Finally, the practical examples, critical reflections, and strategic recommendations gathered in this deliverable provide a foundation for shaping the next generation of KENs and for designing a robust, adaptive, and inclusive SSBD that can deliver timely and policy-relevant knowledge for biodiversity governance in Europe.

8. References

Beiderbeck, Daniel, Nicolas Frevel, Heiko A. von der Gracht, Sascha L. Schmidt, and Vera M. Schweitzer. 2021. "Preparing, Conducting, and Analyzing Delphi Surveys: Cross-Disciplinary Practices, New Directions, and Advancements." MethodsX 8: 101401. https://doi.org/10.1016/j.mex.2021.101401.

Castellar, Cristobal, Georgia Garrard, Roshan Sharma, Alessandro Ossola, and Sarah Bekessy. 2021. "Choosing the Right Nature-Based Solutions to Meet Diverse Urban Challenges." Urban Forestry & Urban Greening 65: 127337. https://doi.org/10.1016/j.ufug.2021.127337.

Croeser, Thami, Sarah Clement, Marta Fernandez, Georgia E. Garrard, Ian Mell, and Sarah A. Bekessy. 2024. "Action Research for Transformative Change." Sustainability Science 19 (2): 665–70. https://doi.org/10.1007/s11625-023-01458-2.

Davis, McKenna, Katrina Abhold, Linda Mederake, and Doris Knoblauch. 2018. "Nature-Based Solutions in European and National Policy Frameworks." https://naturvation.eu/result/nature-based-solutions-european-and-national-policy-frameworks.

Dicks, Lynn V., Tom D. Breeze, Hien T. Ngo, et al. 2021. "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." Nature Ecology & Evolution 5: 1453–61. https://doi.org/10.1038/s41559-021-01534-9.

Dorst, Hade, Alexander van der Jagt, Helen Toxopeus, Laura Tozer, Rob Raven, and Hens Runhaar. 2022. "What's behind the Barriers? Uncovering Structural Conditions Working against Urban Nature-Based Solutions." Landscape and Urban Planning 220: 104335. https://doi.org/10.1016/j.landurbplan.2021.104335.

European Commission. 2018. EU Pollinators Initiative. Brussels: European Commission.

European Commission. 2020. EU Biodiversity Strategy for 2030: Bringing Nature Back into Our Lives. Brussels: European Commission.

European Commission. 2022. Urban Greening Plans: Guidance for Cities to Help Prepare an Urban Greening Plan. Brussels: European Commission.

European Commission. 2023. A New Deal for Pollinators: Revised EU Pollinators Initiative. Brussels: Directorate-General for Environment.

Faivre, Nicolas, Marco Fritz, Tiago Freitas, Birgit de Boissezon, and Sofie Vandewoestijne. 2017. "Nature-Based Solutions in the EU: Innovating with Nature to Address Social, Economic and Environmental Challenges." Environmental Research 159 (August): 509–18. https://doi.org/10.1016/j.envres.2017.08.032.

Hawxwell, Tom, Sophie Mok, Ernesta Mačiulytė, Johannes Sautter, and Ekaterina Dobrokhotova. 2019. "Municipal Governance for Nature-Based Solutions: Executive Summary of the UNALAB Municipal Governance Guidelines."

IPBES. 2016. Assessment Report on Pollinators, Pollination and Food Production. Bonn, Germany: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Secretariat.

IPBES. 2016. "Summary for Policymakers of the Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production." https://doi.org/10.5281/zenodo.2616458.

IPBES. 2019. "Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services (Summary for Policy Makers).". https://doi.org/10.5281/zenodo.3553579.

Kabisch, Nadja, Niki Frantzeskaki, Stephan Pauleit, Sandra Naumann, McKenna Davis, Martina Artmann, Dagmar Haase, et al. 2016. "Nature-Based Solutions to Climate Change Mitigation and Adaptation in Urban Areas: Perspectives on Indicators, Knowledge Gaps, Barriers and Opportunities for Action." Ecology and Society 21 (2). https://doi.org/10.5751/ES-08373-210239.

Raymond, Christopher M., Niki Frantzeskaki, Nadja Kabisch, Pam Berry, Margaretha Breil, Mihai Razvan Nita, Davide Geneletti, and Carlo Calfapietra. 2017. “A Framework for Assessing and Implementing the Co-Benefits of Nature-Based Solutions in Urban Areas.” Environmental Science and Policy 77: 15–24. https://doi.org/10.1016/j.envsci.2017.07.008.

Sarabi, Shahryar, Qi Han, Bauke de Vries, and A. Georges L. Romme. 2022. “The Nature-Based Solutions Planning Support System: A Playground for Site and Solution Prioritization.” Sustainable Cities and Society 78: 103608. https://doi.org/10.1016/j.scs.2021.103608.

Schröter, Barbara, Jochen Hack, Frank Hüesker, Christian Kuhlicke, and Christian Albert. 2022. “Beyond Demonstrators—Tackling Fundamental Problems in Amplifying Nature-Based Solutions for the Post-COVID-19 World.” npj Urban Sustainability 2 (1): 4. https://doi.org/10.1038/s42949-022-00047-z.

Toxopeus, Helen, and Friedemann Polzin. 2021. “Reviewing Financing Barriers and Strategies for Urban Nature-Based Solutions.” Journal of Environmental Management 289 (March): 112371. https://doi.org/10.1016/j.jenvman.2021.112371.

UNEP. 2022. Resolution on Nature-Based Solutions for Supporting Sustainable Development. United Nations Environment Assembly, Nairobi.

Wilk, Bettina, Andreas Vetter, and Alice Schröder. 2021. “Tackling the Climate and Biodiversity Crises in Europe through Urban Greening Plans.” https://citieswithnature.org/tools-and-resources/276.

Xie, Linjun, and Harriet Bulkeley. 2020. “Nature-Based Solutions for Urban Biodiversity Governance.” Environmental Science and Policy 110 (February): 77–87. https://doi.org/10.1016/j.envsci.2020.04.002.

Annexes

ANNEX 1 – LISTS OF ORGANIZATIONS AND NETWORKS CONSIDERED IN THE DCS' NETWORKS.

This annex summarizes the organizations and networks mapped or engaged across the Pollination, Freshwater, and NBS DCs. Each entry indicates the organization's main domain (Science, Policy, Society, or Business & Finance), its scale of operation (Local, National, EU, or Global), and its level of engagement with each DC. Engagement is coded as follows: 3 – actively participated in DC activities; 2 – informed about BioAgora and the SSBD; 1 – mapped but not contacted or no response received; 0 – not mapped.

Organizations & Networks' Name	Domains	Scale	DCs' Engagement level		
			Pollination	Freshwater	NBS
Aalborg University	Science	-	0	3	0
Adam Mickiewicz University	Science	National	0	0	3
Alliance for Freshwater Life	Science, Policy, Society	Global	0	3	0
Alliance for Global Water Adaptation	Science, Policy	Global	0	1	0
ALTER-Net	Science, Policy, Society,	EU	0	3	0
Amsterdam City Council, Department of Planning and Sustainability	Policy	Local	0	0	3
Arcadis	Society	-	0	0	1
Association for the sciences of Limnology and Oceanography	Science, Policy, Society	-	0	2	0
Atalaya Agency	Science, Society, Business & Finance	Local	0	0	1
Balaton Limnological Research Institute	-	-	0	3	0
Barcelona City Council	Policy	Local	0	0	1
Biodiversa+	Science, Society	EU	0	2	2
BioSense Institute	-	-	3	0	0
Bolin Centre for Climate Research	Science	Global	0	1	0
Butterfly Conservation Europe	-	-	3	0	0
Centre for Ecological Research (Hungary)	-	-	3	0	0
Centre for Sustainability, Environment and Health (Netherlands)	Policy, Science,	National	0	0	1
Cities4Biodiversity	Policy	Global	0	0	1
CitiesWithNature	Policy	Global	0	0	1

City of Copenhagen, Technical and Environmental Administration	Policy	Local	0	0	1
City of Genk	Policy	Local	0	0	2
City of Hamburg	Policy	Local	0	0	2
City of Helsinki, Urban Environment Division, Urban Space and Landscape Planning	Policy	Local	0	0	1
City of Leipzig, Office for Urban Greenery and Water Bodies	Policy	Local	0	0	1
City of Paris	Policy,	Local	0	0	1
Codema	Policy, Science, Society	Local	0	0	1
Connecting Nature Enterprise Platform	Business & Finance	Global	0	0	3
Copa-Cogeca	-	-	3	0	0
Cornell University	Science	Global	0	3	0
CSIC	-	-	3	0	0
Dam Removal Europe	Policy, Society	Global	0	3	0
Deltares	Science, Policy	Global	0	3	0
Directorate-General for Agriculture and Rural Development	Policy	EU	3	0	0
Directorate-General for Climate Action	Policy	EU	0	0	1
Directorate-General for Environment	Policy	EU	3	3	3
Directorate-General for Mobility and Transport	Policy	EU	0	3	0
Directorate-General for Regional and Urban Policy	Policy	EU	0	1	1
Directorate-General for Research and Innovation	Policy	EU	0	1	3
Dublin City Council	Policy,	Local	0	0	1
Ecologic Institute	Policy, Science	EU	0	0	3
European Environment Agency	Policy, Science	EU	3	0	0
ELO	-	-	3	0	0
Estonian University of Life Sciences	Science	National	3	0	0
ETH Zurich	Science	Global	0	3	0
European Centre for River Restoration	Policy, Science	EU	0	3	0
European Federation of Green Roof & Living Wall Associations	Policy, Science, Business & Finance	EU	0	0	3
European Forest Institute	Policy, Science, Society	EU	0	0	3
European Investment Bank	Business & Finance	EU	0	0	1
European Urban Initiative	Policy	EU	0	0	1

Federal Agency for Nature Conservation	Policy	National	0	2	0
Foundation for Applied Water Research	Policy, Science,	Global	0	1	0
Freshwater Biodiversity Observation Network	Science, Policy, Society	Global	0	2	0
Glasgow City Council	Policy	Local	0	0	3
Global Platform for Sustainable Cities	Policy, Business & Finance	Global	0	0	1
Greater London Authority	Policy	Local	0	0	1
Greening Cities Partnership	Policy, Science,	EU	0	0	2
Grenoble-Alpes Métropole	Policy	Local	0	0	1
Grupo Aranea	Science, Society, Business & Finance	Local	0	0	1
Hellenic Centre for Marine Research	-	-	0	3	0
Horizon Nua	Business & Finance,	EU	0	0	1
Humboldt Institute (Bogotá, Colombia)	Policy, Science	National	0	0	3
Humboldt University of Berlin	Science	National	0	3	3
IEEP	-	-	3	0	0
IFOAM-Organics International	-	-	3	0	0
Innsbruck University	Science	Global	0	3	0
INP-AgroToulouse ENSAT	-	-	3	0	0
INRAE RiverLY	Policy, Science	National	0	3	0
Institute for ichthyological and ecological research	-	-	0	3	0
International Council for Local Environmental Initiatives	Policy, Science	Global	0	0	3
International Network of Basin Organisations	Policy	Global	0	3	0
International Union for Conservation of Nature	Science, Society	Global	3	0	2
Italian National Research Centre	Science	National	0	0	3
Italian NBS Hub	Policy, Science, Society, Business & Finance	National	0	0	2
Jagiellonian University (Krakow)	Science	-	3	0	0
Joint Research Centre	Science, Policy	EU	3	3	3
Karlstad University	Science	Global	0	3	0
LAND Italia	Science	EU	0	0	3
Lappeenranta City Council	Policy	Local	0	0	3
Leiden University	Science	National	0	0	3

Lisbon City Council, Department of the Environment, Green Structure, Climate, and Energy	Policy	Local	0	0	3
Lund University	Science	-	3	0	0
Luxembourg Institute of Science and Technology	Science	National	0	3	0
Madrid City Council, Department of Water and Green Areas Management	Policy	Local	0	0	3
MLU Halle-Wittenberg	Science	National	3	0	0
Municipality of Turin	Policy	Local	0	0	2
National Institute for Oceanography and Applied Geophysics	Science	National	0	3	0
Nature and Biodiversity Conservation Union	Society	National	0	0	1
Naturmål	Science	National	0	2	0
Norfolk Rivers Trust	Science, Policy	Local	0	3	0
Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences	Science	Global	0	3	0
Northumbria University	Science	-	3	0	0
Norwegian Institute for Nature Research	Science, Society		0	3	0
Okolowe	Society	Local	0	0	1
One Water	Society, Science	Global	0	3	0
Open Rivers Programme	Business & Finance	EU	0	2	0
Oppla	Science, Society	EU	0	0	2
Organisation for Economic Co-operation and Development	Policy	Global	0	0	1
Planning Authority (Malta)	Policy	National	0	0	3
Politecnico di Milano	Science	National	0	0	3
Promote Pollinators.org	-	-	3	0	0
Rewilding Europe	Society	EU	0	1	0
Rhine Tracking Network	-	-	0	2	0
Royal Holloway University of London	Science	-	3	0	0
Senckenberg Research Institute	Science, Society	Global	0	3	0
Sendzimir Foundation	Policy, Science, Society	EU	0	0	3
Society of Limnology	Science, Society, Policy	Global	0	2	0
South West Water	Business & Finance	National	0	0	3
South Yorkshire Forest Partnership	Policy, Science, Society	Local	0	0	2

Steinbeis Europa Zentrum	Science, Society, Business & Finance	EU	0	0	3
Sustainable Land Use Partnership	Policy, Science	EU	0	0	1
Swedish University of Agricultural Sciences	Science	Global	3	3	0
Swiss Federal Institute for Aquatic Science and Technology	Science	National	0	3	0
Technical University of Munich	Science	Global	0	3	0
Tecnalia	Policy, Science	EU	0	0	3
The Nature Conservancy	Policy, Society	Global	0	3	0
The Nature of Cities	Society, Science, Business & Finance, Policy	Global	0	0	1
The Pollinators.org	-	-	3	0	0
Turku City Council	Policy	Local	0	0	3
UK Centre for Ecology & Hydrology	Policy, Science	National	3	3	3
Università di Padova	Science	-	3	0	0
Universität Freiburg	Science	-	3	0	0
Universität Würzburg	Science	-	3	0	0
Université de Mons	Science	-	3	0	0
University College Dublin	Science	-	3	0	0
University of Antwerp	Science	National	0	0	3
University of Applied Sciences Trier	Science	Global	0	3	0
University of Bern	Science	Global	0	3	0
University of Cambridge	Science	Global	0	3	0
University of Cologne	Science	Global	0	3	0
University of Copenhagen	Science	Global	0	3	0
University of Duisburg-Essen	Science	Global	0	3	0
University of Hull	Science	Global	0	3	0
University of Lisbon	Science	Global	0	3	0
University of Natural Resources and Life Sciences, BOKU	Science	Global	0	3	0
University of Nevada	Science	Global	0	3	0
University of Novi Sad	Science	-	3	0	0
University of Reading	Science	-	3	0	0
University of São Paulo (ESALQ)	Science	Global	0	3	0
University of the Aegean	Science	-	3	0	0
University of the Basque Country	Science	Global	0	3	0
University of Warmia and Mazury in Olsztyn	Science	Global	0	3	0
University of Warsaw	Science	Global	0	3	0
UrbanByNature	Policy, Science, Society, Business & Finance	Global	0	0	1

Van Hall Larenstein University of Applied Sciences	Science	-	0	3	0
Ville et Eurométropole de Strasbourg, Department of Territorial Ecology	Policy	Local	0	0	1
Wageningen University Research	Science, Policy, Society	National	3	3	3
WBF Agroscope	-	-	3	0	0
Wetlands International	Policy, Society, Science	Global	0	3	0
What's That Green?	Policy, Society, Business & Finance	EU	0	0	1
Wildlife Estonia	-	-	0	3	0
World Bank Group	Policy, Business & Finance	Global	0	0	1
World Business Council for Sustainable Development	Business & Finance	Global	0	0	1
World Fish Migration Foundation	Policy, Society, Science	Global	0	3	0
World Wildlife Fund (WWF)	Policy, Science	Global	0	3	0
Zaragoza City Council, Environment and Sustainability Agency	Policy	Local	0	3	1

ANNEX 2 – LISTS OF EU-FUNDED PROJECTS CONSIDERED IN THE DCS' NETWORKS.

This annex presents a list of EU-funded projects that were mapped or engaged in the Pollination, Freshwater, and NBS DCs. Each entry includes the project's acronym and full title, the associated funding programme, and the level of engagement with each DC. Engagement is coded as follows: 3 – actively participated in DC activities; 2 – informed about BioAgora and the SSBD; 1 – mapped but not contacted or no response received; 0 – not mapped.

Project's Acronym	Project's Full Name	Funding program	DCs' Engagement level		
			Pollination	Freshwater	NBS
VOODOO	Viral eco-evolutionary dynamics of wild and domestic pollinators under global change	Biodiversa	3	0	0
NutriB2	Nutrition as critical link between Biodiversity and Bee health		3	0	0
STING	Science and Technology for Pollinating Insects	DG ENV	3	0	0
SPRING	Strengthening Pollinator Recovery through INdicators and monitorinG		3	0	0
Orbit	Taxonomic Resources for European Bees		3	0	0
Taxofly	Taxonomic Information for European Hoverfly Species		3	0	0
EUPoMS	Proposal for an EU pollinator monitoring scheme		3	0	0

EMBAL	European Monitoring of Biodiversity in Agricultural Landscape		3	0	0
EMBRACE	European Butterfly Monitoring		3	0	0
POLLHAB	Pollinators typical of habitats protected under the Habitats Directive		3	0	0
NatUR-W	Nature-based Urban Regeneration through Water: Integrating the water cycle in urban renaturalization	European Urban Initiative	0	0	1
CLEARING HOUSE	Collaborative Learning in Research, Information-sharing and Governance on How Urban tree-based solutions support Sino-European urban futures	H2020	0	0	3
CONNECTING Nature	COproductioN with NaturE for City Transitioning, INnovation and Governance		0	0	3
REGREEN	Fostering nature-based solutions for smart, gre		0	0	3
GROW GREEN	Green Cities for Climate and Water Resilience, Sustainable Economic Growth, Healthy Citizens and Environments		0	0	2
INTERLACE	INTERnational cooperation to restore and connect urban environments in Latin AmeriCa and Europe		0	0	3
proGIreg	productive Green Infrastructure for post-industrial urban regeneration		0	0	3
Safeguard	Safeguarding European wild pollinators		3	0	0
Showcase	SHOWCASing synergies between agriculture, biodiversity and Ecosystem services to help farmers capitalising on native biodiversity		3	0	0
PoshBee	Pan-European Assessment, Monitoring, and Mitigation of Stressors on the Health of Bees		3	0	0
EuropaBON	Europa Biodiversity Observation Network: integrating data streams to support policy		3	0	0
Danube4All	Restoration of the Danube River Basin for ecosystems and people from mountains to coast		0	3	0
AMBER	Adaptive Management of Barriers in European Rivers		0	3	0
RIBES	RIver flow regulation, fish BEhaviour and Status		0	2	0
GoNaturePositive	Building economies by embracing nature's worth	Horizon Europe	0	0	3
ClimaGen	Climate-resilient reGeneration and renaturing for, by and with vulnerable neighbourhoods, striving towards net-zero		0	0	1
USAGE	Data Usage Control for empowering digital sovereignty for All citizens		0	0	2
UGPplus	Enhanced Urban Nature Plans for Biodiversity Mainstreaming in Society		0	0	3

GreenInCities	Green Cities for Climate and Water Resilience, Sustainable Economic Growth, Healthy Citizens and Environments		0	0	2
NBSoil	Nature Based Solutions for Soil Management		0	0	1
NN+	NetworkNature Plus		0	0	3
PIISA	Piloting Innovative Insurance Solutions for Adaptation		0	0	3
URBREATH	Systemic Integration of Transformative Technical and Nature-based Solutions to Improve Climate Neutrality of European Cities and Regions and tackle Climate Change: the URBreath Approach		0	0	1
SOS-Water	Safe Operating Space for Water		0	3	0
AquaINFRA	AquaInfra – Infrastructure for Marine and Inland Water Research		0	3	0
NaturaConnect	Building a resilient ecological network of conserved areas across Europe for nature and people		3	3	0
Restore4Life	Restoration of wetland complexes as life-supporting systems in the Danube Basin		0	3	0
EcoAdvance	Advancing freshwater ecosystem restoration: people-centred perspectives		0	3	0
EcoDalli	ECOsystem-based governance with DAnube lighthouse Living Lab for sustainable Innovation processes		0	3	0
Danube Lifelines	A pioneering, transdisciplinary blueprint for the recovery of migratory fish and their habitats in the Danube River Basin		0	3	0
GoNEXUS	Innovative tools and solutions for governing the water-energy-food-ecosystems NEXUS under global change		0	2	0
SELINA	Science for Evidence-based and sustainabLe decIsions about NAtural capital		0	3	0
RestPoll	Restoring pollinator habitats across European agricultural landscapes		3	0	0
INSIGNIA	Preparatory action for monitoring of environmental pollution using honey bees		3	0	0
TETTRIs	Transforming European Taxonomy through Training, Research and Innovations		3	0	0
NATURE-FIRST	Preventing the decline of biodiversity		1	0	0
DISSCO	Distributed System of Scientific Collections		3	0	0
MAMBO	Modern approaches to the monitoring of biodiversity		3	0	0
AGRI4POL	Promoting sustainable agriculture for pollinators		3	0	0
VALOR	VALues and dependence of society on pollinatORs		3	0	0

WildPOSH	Pan-European assessment, monitoring, and mitigation of chemical stressors on the health of wild pollinators		3	0	0
BIG4LIFE	(Building-integrated Greenery): Collaborative xeriscaping-based maintenance and monitoring in Mediterranean cities	LIFE Programme	0	0	1
LifeMedGreenRoof	Constructing two demonstration green roofs to illustrate the potential of meeting environmental and energy targets		0	0	1
UrbanGreening Plans	Designing innovative mechanisms to plan, implement, strengthen and manage green infrastructures in (peri-)urban areas		0	0	1
LIFE@Urban Roofs	Stimulating private investment in climate adaptation - who's afraid of red, yellow, green and blue		0	0	1
IGNITION	Innovative financinG aNd dellvery of naTural clImate sOlutioNs in Greater Manchester	Urban Innovative Actions Programme	0	0	3
RESILIO	Resilience nEtwork of Smart Innovative cLImate-adapative rOoftops		0	0	3

ANNEX 3 – DESCRIPTION OF THE REQUALIFICATION GREENING PROJECT FOR ACTIVITY C9 OF THE NBS DC

Busytown is a mid-sized city of 700,000 residents with an abandoned industrial area of 100 ha. The city government would like to requalify the area through the implementation of urban NBS, such as creating a new urban park. Through this development, the city aims to reduce air and noise pollution, provide natural amenities and a better-quality life for residents in the area, and increase the value of the surrounding neighborhood. The former industrial area is surrounded by a low-to-middle-income residential neighborhood with a few small local businesses (small grocery stores, family restaurants, small bakeries, cafes, etc.) and an aging population. The area does not attract many tourists, but the municipality would like to boost its popularity partly through the development of this park for recreation and entertainment.

Participants were assigned a specific role according to their background among the following options:

- Policy category – Local government's urban planning officer: You work in the local government's urban planning office and lead the team of green development and nature-based solutions. You get the city's file on redeveloping the abandoned industrial lot and you see this as a great opportunity to finally bring more nature to the area. You are aware of gentrification issues and would like to make sure that the plan you work on will take these considerations seriously. With the city covering only 10% of the needed investment, you would like to propose that the remaining funds are raised through local businesses and community partnerships to avoid gentrification issues. You prioritize sustainable, nature-based solutions and are wary of a big company's involvement, fearing it may not align with your vision for long-term community benefit.
- Business category – A national oil company: You heard about plans of the city to redevelop a 100 ha former industrial area into an urban park with green amenities. You see investing in this project as an opportunity to offset some of the environmental impact of your business and improve your PR. Hence, you are considering partnering with the municipality to make it happen.

- Business category - Small local business owner: Your business is located in your neighborhood near the abandoned industrial area, and mostly attracts local residents. You would like to attract more customers to increase your profit. Therefore, you support the re-greening project and are thinking about teaming up with other local businesses to invest in the development. Nonetheless you are afraid of losing the character of the neighborhood, and of competing with high-scale businesses.
- Scientist – Environmental engineer and researcher at a national university: You are part of a university team who is consulted by the municipality to draft a plan for the requalification of the industrial area. You have to consider several factors, such as noise pollution, water retention, etc., the provision of various ecosystem services, and the suitable design of the urban park, including various facilities (entertainment, sporting facilities, playgrounds, etc.).
- Local Community – Vulnerable elderly resident: You moved to the area as a young adult and now live by yourself in a social housing apartment supported by your pension. You have a strong emotional connection to the neighborhood and its current character, and you wouldn't consider moving. Your doctor advised you to exercise more, and a public park would give you a space to walk around. However, you are concerned that it would attract foreign residents, tourists, and a lot of noise, which could completely change the fabric of the neighborhood. You also worry about losing your right to social housing and being displaced. At your age, you couldn't adjust to living in a new area.

ANNEX 4 – FULL SURVEY INSTRUMENT FOR THE SCOPING AND RAKING SURVEY OF ACTIVITY B8 OF THE FRESHWATER DC

Scoping survey - SurveyMonkey

Page	Topic	Content	Subquestion/additional text	Answer options
1	Terms & Conditions	Participation to this survey is entirely voluntary, and no personal data will be gathered of participants. The survey is part of the project "BioAgora – Biodiversity Knowledge Agora: Developing the Science Service for European Research and Biodiversity Policymaking", funded by the Horizon Europe programme, and particularly its task on Assessing future knowledge needs and horizon scanning (T3.3), led by Norwegian Institute for Nature Research. The survey is aiming to map ways to aid restoration of European rivers most effectively. The results may be used to guide policies, particularly research prioritization, around river restoration; yet no political effects or uses of the results are guaranteed, and participation should not be considered as replacement of any other type of political activity. Please note that not all participants get access to all survey questions, as we are testing the effects of survey formulation and participants' background on responses. The results of the survey will be published in scientific journals as well as communicated to media, and may benefit researchers, policymakers, managers, journalists, and different organizations across Europe. The survey will take approximately two minutes to fill, but participants may opt for longer to give more detailed answers. Participation is entirely voluntary, and no personal data will be gathered of participants, and thus we will not be able to or erase data after it has been submitted by the participant. Any questions about the study or participants' rights can be addressed to survey leader Katariina	I confirm I have read and understood these Terms & Conditions and my participation to the survey.	Tick the box for agreement
2	Question	Europe is planning to restore 25.000 km of free-flowing rivers by 2030. What **new research** should be conducted that would be most helpful in helping in achieving this goal?	You may insert up to three research topics/questions in the order of importance.	3 open-ended response boxes
3	Questions	Europe is planning to restore 25.000 km of free-flowing rivers by 2030. What is the most important **action** that should be taken to achieve this target?	Who should take action?	Open-ended response
			What action should they take?	Open-ended response
			On which level should the action be taken?	Tick the box: (1) local, (2) regional, (3) national, (4) Europe/global
			Have you been involved in such action(s) yourself, and if so,	Open-ended response
4	Question	Do you have a background in natural or societal sciences? (If you have some background in both natural or societal sciences, please select the field which covers most of your education and work years.)		Tick the box: (1) Natural sciences (ecology, biology, hydrology, etc.); (2) Societal sciences (political sciences, conflict management, economics, etc.); (3) No scientific background
4	Question	What is your current position or connection to river restoration? (Please select the one that best describes your position or connection)		Tick the box: (1) Researcher, (2) Policymaker, (3) Manager, (4) Volunteer, (5) NGO-worker, (6) Landowner, (7) Other (please specify): [open
4	Question	What country do you live in or are currently based?		Open-ended response
5	Information about workshop	Thank you for your responses! Would you like to join a workshop? The priorities identified in this survey will be discussed further at the Free Flow conference April 15-17th 2024 in Groningen, Netherlands. Please see more information here: https://freeflowconference.eu/.		

Ranking survey - SurveyMonkey

Page	Topic	Content	Subquestion/additional text	Answer options
1	Terms & Conditions	Participation in this survey is entirely voluntary, and no personal data will be collected. The survey is part of the BioAgora project, funded by Horizon Europe. It aims to identify effective ways to support European river restoration. The results may inform research prioritization and policy-making around river restoration, although no specific political outcomes are guaranteed. The survey results may be published in reports or scientific journals and shared with researchers, policymakers, managers, journalists, and organizations across Europe. The survey takes about 20 minutes to complete, though participants can take longer to provide detailed responses. Since no personal identifiers will be collected, it won't be possible to delete individual responses once submitted. For any questions about the study or participants' rights, please contact survey leader Twan Stoffers (twan.stoffers@igb-berlin.de).		Tick the box for agreement
1	Information about collaborative paper	Before you begin: we have an exciting opportunity to share: Based on the priorities you help establish through this survey, we will be drafting a scientific paper. We invite participants to join the writing process and potentially become co-authors. We think this is a nice opportunity to contribute further and gain recognition for your expertise.We estimate that completing this survey thoughtfully will take approximately 20 minutes. It is important to take your time and not rush through the ranking excersize, as your thorough and considered responses are crucial for establishing the research priority list that will be communicated in the paper.If you are interested in being a part of the paper writing process and are willing to engage in subsequent discussions and the writing phase, please provide your email address below.By providing your email, you indicate your willingness to participate actively in the development of our scientific paper. Please note: By choosing to engage further, your data will be temporarily stored in a non-anonymized form to facilitate collaboration. All personal data will be anonymized after the survey concludes, in compliance with our data protection		Open-ended response
2	Questions	Do you have a background in natural or societal/social sciences? If you have some background in both natural or societal sciences, please select the field which covers most of your education and work years.		Tick the box: (1) Natural sciences (ecology, biology, hydrology, etc.); (2) Societal sciences (political sciences, conflict management, economics, etc.); (3) No scientific background
2	Question	What is your current position or connection to river restoration? Please select the one that best describes your position or connection.		Tick the box: (1) Researcher, (2) Policymaker, (3) Manager, (4) Volunteer, (5) NGO-worker, (6) Landowner, (7) Other (please specify): [open
2	Question	What country do you live in or are you currently based in?		Open-ended response
2	Ranking exercize	Now the real work starts! From over 700 research topics suggested by more than 300 respondents in our initial online survey, we have condensed the list to 27 key research topics. These topics represent the most critical areas identified through a rigorous analysis of the initial responses, ensuring that they capture the essential research needed to restore 25,000 km of free-flowing rivers across Europe.Please prioritize your top 10 research topics, indicating which you believe are most important for achieving the NRL goal of restoring 25,000 km of free-flowing rivers in Europe. How? Drag and drop the topics into your top 10 by either dragging them to the desired position or using the up/down arrows, whereby 1 is the absolute most important and 10 is less important but still in the group of the 10 most important research priorities. Only your top 10 rankings will be analyzed. Topics outside the top 10 do not require further ranking and will not be included in the subsequent analysis. *Important: Complete this section on a laptop or PC (not on a mobile phone) to maintain a clear overview of the topics!		Drag and drop function in SurveyMonkey with all 27 identified research topics
3	Optional question	We are almost done with the survey and really appreciate the thought you've put into your top 10 ranking! If you're up for sharing a bit more, we would love to hear why you chose your top-ranked topic as the most important for restoring free-flowing rivers. [This is OPTIONAL] This information will be used as input for the		Open-ended response

ANNEX 5 – QUESTIONNAIRES FOR DELPHI SURVEY RELATED TO ACTIVITY C11 OF THE NBS DC

URBAN NATURE PLAN DELPHI SURVEY - round 1

The survey is conducted by the Planes Lab at University of Trento as part of the Horizon Europe project BioAgora, which aims to set up a European Science Service for Biodiversity.

The survey focuses on Urban Nature Plans (formerly named Urban Greening Plans) introduced by Target 14 of the EU Biodiversity Strategies for 2030. The target calls on all European cities and towns above 20,000 inhabitants to develop ambitious Urban Nature Plans that systematically mainstream nature-based solutions and green infrastructure thinking in cities to ultimately enhance biodiversity and human well-being.

The twofold purpose of the survey is (i) to collect experts' opinions on crucial components of good and *ambitious* Urban Nature Plans, and (ii) to identify specific content included or missing in a sample of existing plans. The questions are inspired by and follow the structure of the "Guidance for cities to help prepare an Urban Greening Plan" by the European Commission. The survey focuses on the most technical aspects of the planning process described therein.

The survey follows a Delphi approach consisting of two/three rounds of consultation. After each round, participants will receive the summary of answers from all respondents.

If you have any questions, please contact us at the email maria.ortaortiz@unitn.it

Thank you for taking the time to contribute to this survey.

PART 1: In this part, we ask you to provide your opinion on the following seven questions based on your professional experience with urban nature/biodiversity planning.

1. What are the main principles and criteria that should be considered to develop the long-term vision and to identify the goals of an urban nature plan?

Provide your answer here: -

2. What are the main indicators (qualitative/quantitative) related to nature and biodiversity that should be included in the information base of urban nature plans?

Provide your answer here: -

3. What type of targets should be included in an ambitious urban nature plan? Please indicate the three that, in your opinion, are the most important. (Examples of target types could be "reducing net greenhouse gas emissions" or "lowering air pollutants concentration", without reporting the quantitative threshold).

Provide your answer here: -

4. What aspects should be considered to identify conservation actions in urban nature plans?

Provide your answer here: -

5. What aspects should be considered to select areas for nature restoration in urban nature plans?

Provide your answer here: -

6. What aspects should be considered to identify greening interventions (e.g., new green spaces or elements such as urban forests, community gardens, green roofs, street trees, constructed wetlands, and rain gardens) in urban nature plans?

Provide your answer here:

7. What criteria should be used to prioritize interventions (of protection, restoration and new greening) in urban nature plans?

Provide your answer here:

PART 2: In this part, we ask you to answer the following questions based on your specific experience in drafting the [Name of the Plan], referred below as "the Plan".

1. Which of the following elements do the Plan's visions and goals consider?

Elements	Yes/ No	If no, please describe what was the reason
Perception of urban green spaces		
Types of urban green spaces.		
Ecosystems conditions and biodiversity.		
Ecosystem services, their supply, and derived societal benefits		
Environmental pressures		

2. Which of the following aspects are analyzed in the information base of the Plan?

Elements	Yes/ No	If no, please describe what was the reason

Land use and land cover in the municipality, including public and private green spaces, urban fabric, and industrial/commercial/transport areas.		
Species, including bird and pollinator species such as butterflies.		
Opportunities and gaps from existing policies, strategies, and plans at several spatial scales.		
Access to green spaces.		
Climate change effects on nature and human well-being, including food risk.		
Urban heat		
Noise pollution		
Air pollution		

3. Did the Plan set any (intermediate and/or final) targets related to the following elements?

Elements	Yes/ No	If no, please describe what was the reason
Percentage of public and private green spaces.		
Percentage of tree canopy cover		
Number of new planted trees		
Percentage of protected areas		
Quality and quantity of habitats for biodiversity,		

including abundance and richness of species		
Number and spread of invasive alien species		
Accessibility to urban green spaces		
Balanced land uses, limiting soil sealing and urban sprawl		
Soil, water, air, and noise pollution		
Climate change mitigation and adaptation		

4. Did the Plan include a monitor protocol? If yes, what were the main indicators? If not, please describe the reason.

Provide your answer here:

5. Did the Plan include conservation actions? If yes, please include some examples.

Provide your answer here:

6. Did the Plan include restoration actions? If yes, please include some examples.

Provide your answer here:

7. Did the Plan include new greening interventions? If yes, please include some examples.

Provide your answer here: -

8. Please rank (from 1- most important, to 3-least important) the three types of actions according to their importance in the Plan:

Conservation actions	Score:
Restoration actions	Score:

New greening interventions	Score
Green / Biodiversity Vision / Policy	Score:

Urban Nature Plan Delphi survey - Round 2

This is the second round of the survey on Urban Nature Plans coordinated by Prof. Davide Geneletti (PLANES Lab, University of Trento) in the framework of the Horizon Europe project BioAgora. The answers that you provided in the first round (see summary here) helped us to formulate additional questions.

Thank you in advance for taking the time to contribute to this survey. We would appreciate receiving your reply by January 17th.

If you have any questions, please contact us at maria.ortaortiz@unitn.it.

In answering the following questions, please keep in mind the definition of Urban Nature Plan provided by the Guidance: "an overarching framework articulating, formalising, and showcasing a city's commitment to promoting and protecting biodiversity and urban greening".

Vision and goals

The previous round led to the identification of four main topics:

a) Biodiversity: This topic emphasizes biodiversity-rich spaces and the status of species in urban areas, including native, vulnerable, non-mobile, and pollinator species, considering efforts to preserve and enhance these species and their habitats.
b) Ecosystem conditions: This topic focuses on the health of ecosystems, with particular attention to spatial coverage, connectivity, vegetation and soil quality, and canopy cover, strengthening the urban green-blue infrastructure.
c) Recreation and cultural ecosystem services: This topic addresses the distribution and accessibility of green spaces to promote human health and well-being and highlights the contribution of green spaces to cultural and aesthetic values in urban settings.
d) Climate change adaptation: This topic focuses on enhancing cities' resilience to climate-related risks such as flooding, heatwaves, and droughts.

Q.1a: How important is to consider biodiversity when formulating the vision and goals of an Urban Nature Plan?

[Provide your answer here]

Q.2a: If you think that biodiversity is important, what are the main limitations or barriers to addressing it properly in the vision and goals of an Urban Nature Plan (e.g., lack of expertise/resources, overlapping responsibilities among different agencies/departments, lack of policy coordination, lack of awareness of decision makers)?

[Provide your answer here]

Q.1b: How important is to consider ecosystem conditions when formulating the vision and goals of an Urban Nature Plan?

[Provide your answer here]

Q.2b: If you think that ecosystem conditions is important, what are the main limitations or barriers to addressing it properly in the vision and goals of an Urban Nature Plan (e.g., lack of expertise/resources, overlapping responsibilities among different agencies/departments, lack of policy coordination, lack of awareness of decision makers)?

[Provide your answer here]

Q.1c: How important is to consider recreation and cultural ecosystem services when formulating the vision and goals of an Urban Nature Plan?

[Provide your answer here]

Q.2c: If you think that recreation and cultural ecosystem services is important, what are the main limitations or barriers to addressing it properly in the vision and goals of an Urban Nature Plan (e.g., lack of expertise/resources, overlapping responsibilities among different agencies/departments, lack of policy coordination, lack of awareness of decision makers)?

[Provide your answer here]

Q.1d: How important is to consider climate change adaptation when formulating the vision and goals of an Urban Nature Plan?

[Provide your answer here]

Q.2d: If you think that climate change adaptation is important, what are the main limitations or barriers to addressing it properly in the vision and goals of an Urban Nature Plan (e.g., lack of expertise/resources, overlapping responsibilities among different agencies/departments, lack of policy coordination, lack of awareness of decision makers)?

[Provide your answer here]

Indicators for information baseline and monitoring

Regarding biodiversity, the following table presents the indicators included in the Guidance and those emerging from the 1st Delphi round.

Indicators	Guidance	Experts' opinions
Species abundance	●	●
Species richness	●	●
Number of visits of key pollinator species		●
City biodiversity index (also known as the Singapore Index on Cities' Biodiversity)		●

Q.3a: Do the indicators comprehensively address the topic? Are there missing or unclear/redundant indicators?

[Provide your answer here]

Q.4a: What are the main critical issues that can affect the use of these indicators during the development and monitoring of Urban Nature Plans? (e.g., data availability, availability of tools, quality standards)?

Kindly provide your comments by specifying, as far as possible, the indicator(s) to which each identified issue refers.

[Provide your answer here]

Regarding ecosystem conditions, the following table presents the indicators included in the Guidance and those emerging from the 1st Delphi round.

Indicators	Guidance	Experts' opinions
Numbers of newly planted trees	●	●
Number of trees in streets and green areas	●	
Tree canopy cover	●	●
Length of tree-lined streets and other corridors connecting urban green spaces.	●	●
Tree distribution by age		●
Number of trees susceptible to diseases and/or with physical and structural issues		●
Number of allergenic tree species		●
Share of permeable soil	●	●
Deadwood volume		●
Biomass volume		●
Size of habitats hosting vulnerable and endangered species		●
Percentage of protected natural areas on public land	●	●
Percentage of urban green space (public and private)	●	●
Areas of different ecosystem types (urban farms/urban meadows/urban hedges/urban forests/green roofs and walls...)	●	●

Q.3b: Do the indicators comprehensively address the topic? Are there missing or unclear/redundant indicators?

[Provide your answer here]

Q.4b: What are the main critical issues that can affect the use of these indicators during the development and monitoring of Urban Nature Plans? (e.g., data availability, availability of tools, quality standards)?

Kindly provide your comments by specifying, as far as possible, the indicator(s) to which each identified issue refers.

[Provide your answer here]

Regarding recreation and cultural ecosystem services, the following table presents the indicators included in the Guidance and those emerging from the 1st Delphi round.

Indicators	Guidance	Experts' opinions
Share of the population that has easy access to public urban green spaces, e.g., within 300 meters	●	●
Proximity to green spaces		●
Number of people visiting nature-based recreational sites		●
Number of school field trips to natural sites		●
Number of trees per inhabitant		●

Q.3c: Do the indicators comprehensively address the topic? Are there missing or unclear/redundant indicators?

[Provide your answer here]

Q.4c: What are the main critical issues that can affect the use of these indicators during the development and monitoring of Urban Nature Plans? (e.g., data availability, availability of tools, quality standards)?

Kindly provide your comments by specifying, as far as possible, the indicator(s) to which each identified issue refers.

[Provide your answer here]

Regarding climate change adaptation, the following table presents the indicators that emerged from the 1st Delphi round, while the Guidance does not mention any indicators for this topic.

Indicators	Guidance	Experts' opinions
Volume of stormwater retained by green spaces		●
Reduction of air and surface temperature due to the cooling effect of green spaces		●

Q.3d: Do the indicators comprehensively address the topic? Are there missing or unclear/redundant indicators?

[Provide your answer here]

Q.4d: What are the main critical issues that can affect the use of these indicators during the development and monitoring of Urban Nature Plans? (e.g., data availability, availability of tools, quality standards)?

Kindly provide your comments by specifying, as far as possible, the indicator(s) to which each identified issue refers.

[Provide your answer here]

Targets

Targets are quantitative or qualitative expressions of the desired performance of specific indicators that allow tracking progress toward Urban Nature Plans' goals. Based on your 1st- survey answers, we would like to focus on the following critical issues related to the inclusion of targets in Urban Nature Plans:

1. The following two core targets suggested in the Guidance were not included in most of the plans that you described: % of canopy cover and number of newly planted trees.

Q.5: Do you think that they are indeed relevant targets to incorporate in every Urban Nature Plan? If not, please explain why.

[Provide your answer here]

2. Most of the plans that you described did not include targets related to climate change adaptation, and some of you argued that they are difficult to set in the context of Urban Nature Plans.

Q.6: What is your position regarding the explicit definition of targets related to climate change adaptation in Urban Nature Plans?

[Provide your answer here]

Priorities and actions

In the plans you described, nature restoration actions received overall lower priority than conservation actions and new greening interventions.

Q.7: What do you think should be the role of Urban Nature Plans with respect to nature restoration in urban areas?

[Provide your answer here]

In your answers to the 1st Delphi round, cost-effectiveness emerged as a concern in relation to actions and their prioritization.

Q.8: Do you think the cost-effectiveness of conservation/restoration/greening interventions should be explicitly addressed by Urban Nature Plans? If so, how would you assess it?

[Provide your answer here]

Coordination between Urban Nature Plans and other policy and planning instruments

In your answers to the 1st Delphi round, differences emerged as to the boundaries and competences of the described plans with respect to existing policy and planning instruments.

Q.9: In your opinion, what would be the most effective way to develop an Urban Nature Plan?

Possible options include considering Urban Nature Plans as:

- a standalone document,
- a part or a chapter of an existing plan or strategy,
- the composition of provisions, strategies, and regulations related to urban nature and biodiversity contained in different plans and policies.

[Provide your answer here]

ANNEX 6 – STRENGTHS, WEARKNESSES, OPPORTUNITIES AND THREATS FOR THE IMPLEMENTATION OF SSBD FUNCTIONS

This Annex presents the collection of lesson learned extracted from all DCs's activities around internal and external factors that may support or hinder the implementation of the SSBD functions.

It groups lessons learned by SSBD function and DC, according to the elements of a SWOT analysis:

- Strengths: Internal features of the DC approach that worked well and can be replicated or built upon.
- Weaknesses: Internal limitations in the DC approach, design, or operational setup that hindered performance or clarity.
- Opportunities: External factors or emerging openings that the SSBD can leverage going forward.
- Threats: External risks or contextual constraints that may undermine the SSBD's goals unless addressed.

Answering In-Depth Requests

- **Strengths**:

Pollination DC

(Activity A1 & A2) Mobilisation of a network of voluntary scientific experts. This was relatively easy through a combination of using personal professional connections and contacting active research projects early. Forward planning and professional presentation with targeted individual invitations clearly and concisely explaining the scope (and links to policy), objective and outputs with incentives elicited confidence in the activity and leveraged participation. Personal research profile of contact point is likely useful in mobilizing responses. Being flexible and open to snowballing of contacts is useful.

(Activity A1 & A2) Ensure equality diversity & inclusion. Targeting a balance of diversity in the working group (40 experts) in terms of gender (17 female 25 male), career stage (29 in permanent research positions and 13 in non-permanent, post-doctoral) and geographical location (Northern (6, 14%), Western (16, 38%), Southern (10, 24%) and Central (8, 19%) European experts) was relatively successful and not difficult to achieve.

(Activity A1 & A2) Provide incentives to catalyze participation of researchers. Data foreseen and obtained is comprehensive with potential to generate scientific impact (paper in 2025) and policy impact (policy brief to inform ongoing policy need in 2025).

(Activity A1) Iterative work process. Expert elicitation (2024) method using Delphi-type approach allowed for individual and group deliberative reflection, consensus building or listening to other perspectives/information sources. This assisted taking collective ownership and allowed modification to procedure.

(Activity A2) Workshop marketing. The effort spent in creating an attractive flyer, invitation & using a Brussels location during an 'Event week' was useful in attracting registration. A novel workshop format using an online 'Gaming tool methodology' proved successful in attracting stakeholders to participate in the December 2024 workshop and in animating the deliberative discussions therein. Active partnership and planning (over months from Feb 2024) with stakeholder organizations (ELO, IUCN) to organize the workshop assisted with the focus, attractivity, access to stakeholders & obtaining participation in the workshop.

(Activity A2) Novel and interesting workshop aims and methods to stimulate participation. Use of an online computer based interactive 'Gaming tool' methodology that simulated decision-making in a virtual landscape proved successful in engendering an active stakeholder engagement and collective multi-actor dialogue. This achieved immediate feedback on how to improve the tool and has led to the planning of a second workshop in June 2025; in this second workshop actual decision data from anonymized stakeholders will be automatically collected for analysis of stakeholder acceptability of various policy responses.

- **Weaknesses:**

Pollination DC

(Activity A1) Complexity and Misunderstandings in Expert Elicitation: Despite substantial preparatory work—including the creation of a detailed protocol, glossary, and guidance documents—misunderstandings persisted

during the elicitation phase. This was attributed in part to the difficulty in phrasing questions with sufficient precision.

(Activity A1) Production of final outputs. Data obtained requires time to check and validate for errors, to analyze, and to prepare outputs, such as writing of a publication. This is hampered by lack of junior scientist support meaning time demands on a single senior scientist slows delivery of this part.

(Activity A2) Results of stakeholder on gaming workshop. Feedback on the acceptability of responses (workshop main aim) was less forthcoming, with most focus placed on the 'wished for' functionality of the tool itself. This was partly because insufficient time was spent on presenting & detailing the accompanying expert elicitation and data obtained. This meant that 'gamers' uncertainty in their actions and visualized responses and impacts was increased, leading to decreased confidence in and questioning of the simulation. More pre- and in-workshop guidance is needed (and planned in the 2025 final workshop) to increase transparency of the method and reduce perceived problems.

- **Threats:**

Pollination DC

(Activity A1) Unfamiliarity of participants with the Delphi methodology and the judgment process. Some participants found it harder than others to make probabilistic or consensus-based assessments.

(Activity A1) Expert availability. Time delays were incurred because of protocol issues, but also due to time availability for voluntary expert participants. The slightly longer process led to some minor turnover of scorers (n=2) between round 1 & 2 because of time constraints. In one case a substitute early career scientist replaced a senior scientist. Multiple online briefings (and recordings circulated) had to be done to accommodate expert availability.

Answering Urgent Requests

- **Strengths:**

Urban NBS DC

(Request N.8) Effective engagement through existing networks: Quick responses were received from individuals who had prior interactions with BioAgora through DC activities or with DC leaders in the context of past projects. This underscores the value of maintaining and strengthening connections within the network.

(Request N.8) Diverse and multi-stakeholder composition of the expert group: A key strength of the process was the formation of an expert group representing a broad spectrum of stakeholders, including city administrations, research institutions, universities, consultancies, policy-oriented organizations, and private sector actors. This diversity enriched the knowledge base, ensured the integration of both scientific and practical perspectives, and strengthened the relevance and applicability of the deliverable across different policy and implementation contexts.

(Request N.8) Ensuring synergies with other projects/initiatives and avoiding duplication: A key success factor was the early identification of complementarities with ongoing initiatives, particularly the UNP Plus project and NN+ Task Forces, which had already compiled and assessed tools using criteria such as affordability, ease of use, data requirements, and real-world validation—providing a solid foundation for the current work. The expert group recognized the opportunity to build on this by expanding the inventory and refining evaluation criteria. Additional synergies were explored with the Greening Cities Partnership and the European Urban Knowledge Network on monitoring urban nature plans, developing indicators aligned with NRR requirements, and identifying good practices—further contributing to policy alignment and relevance.

(Request N.8) Ensuring the answering process and outputs strengthen the NBS network and its resources: Opportunities were identified to align the outputs with existing platforms and initiatives to enhance their visibility and long-term value. For example, the report could feed into urban planning guidance on the Urban Nature Platform, while NetworkNature could help keep the tools database updated and include new tools and user feedback over time.

- **Weaknesses**

Urban NBS DC

(Request N.8) Limited engagement from project coordinators: While contacting coordinators of EU-funded projects helped identify some expert candidates, the response rate was low. Out of 54 projects screened, 12 were pre-selected for relevance, and 8 coordinators were contacted. Only three responded positively, with one recommending a less suitable candidate, and the remaining either declined or did not reply. This highlights the need to explore more effective and targeted strategies for engaging project coordinators and partners not previously connected with BioAgora, e.g., very recent projects.

(Request N.8) Long-term sustainability of the focal points' roles: Focal points are central to operationalizing requests. They handle administrative coordination, support the Co-chairs, lead the scoping phase with requesters, and manage the formation of expert panels. Their effectiveness relies on both strong organizational skills and sufficient thematic knowledge to navigate the expert landscape and ensure relevance, balance, and diversity in panel composition. Currently, this role is supported through the person-months allocated to the DCs, but it involves high time demands with limited formal recognition, authorship, or compensation for their largely behind-the-scenes contributions. Looking ahead, the governance of the SSBD must establish a transparent and sustainable mechanism for identifying and supporting focal points beyond BioAgora.

Freshwater DC

(Request N.7) The analyzed networks of the freshwater DC did not match the search for experts. Thus, only few experts were found.

- **Opportunities:**

Urban NBS DC

(Request N.8) Need for early planning of dissemination activities: The expert group highlighted the importance of defining clear dissemination goals early in the process to address both practical and academic audiences. Producing accessible outputs for practitioners—such as a tool inventory or online repository—was seen as essential for real-world impact, while opportunities for academic publications were identified as important incentives for researchers to actively engage in the answering process. Aligning dissemination strategies with these varied motivations helps ensure meaningful participation from both practice- and research-oriented stakeholders, ultimately strengthening the quality and reach of the final deliverable.

Freshwater DC

(Request N.7) Further benefits might come up, for example to transfer knowledge about the importance of free-flowing rivers for the good ecological state of several wetland types.

- **Threats:**

Urban NBS DC

(Request N.8) Lack of accessible contact information: Identifying contact details for project coordinators through CORDIS or other databases proved challenging and time-consuming. The SSBD would greatly benefit from access to a centralized EU database that profiles individuals involved in EU-funded projects—detailing their roles, areas of expertise, project involvement, and contact information. This system could be inspired/rely on the structure of ORCID, which provides unique researcher identifiers linking individuals to their publications, affiliation and research activities. A similar approach for EU project participants would enhance transparency, foster collaboration, and significantly improve the efficiency of expert identification and engagement.

(Request N.8) Limited proactivity of Co-chairs in leading scientific coordination at initial stages: While the co-chairs made valuable contributions, they faced some challenges in fully assuming a leadership role—possibly due to limited familiarity with the answering process, and the time constraints of their pro bono involvement. This highlights the importance of a more structured onboarding and role-specific guidance to better prepare Co-chairs for their responsibilities and support effective coordination in future exercises.

Freshwater DC

(Request N.7) The lack of a ticket targeting the NRL article 9, is an issue as lobbyists of hydropower can oppose the NRL target with referring to the Renewable Energy Directive (RED (EU) 2023/2413). We urgently need discussions and requests on this subject of the BD target to restore free-flowing rivers.

Linking up with biodiversity policy & strategies

- **Strengths:**

Pollination DC

Strategic Policy Alignment for Impactful Engagement: The Pollination DC successfully aligned its activities with EU Biodiversity Strategy 2030 targets and the EUBP Working Group's declared needs, ensuring high policy relevance and uptake potential.

Freshwater DC

(Activity B2 & B3) Ensuring scientific credibility through policy alignment: From the outset, we embedded experts from leading river-restoration research groups and NGOs into our DC activities. This close collaboration allowed us to align every recommendation with the precise terminology and requirements of the Nature Restoration Law, the Water Framework Directive and the Habitats Directive. As a result, our analysis of the challenges of the NRL for restoring free-flowing rivers carried both the scientific rigor and legal clarity needed to inform Member States' restoration plans with confidence.

(Activity B3) Framing practical, ecosystem-specific guidance: We structured our recommendations to show how barrier-removal measures can directly support the restoration of Annex I habitats under the Water Framework Directive, while fulfilling Articles 5 and 9 of the Nature Restoration Law. By pairing each type of barrier intervention with concrete case studies, we created a clear, step-by-step framework that practitioners can tailor to their own ecosystems. This approach bridges the gap between high-level legal requirements and actionable, site-specific restoration plans.

(Activity B2) Building buy-in through interdisciplinary engagement: Restoring free-flowing rivers demands expertise in hydrology, ecology, governance and community outreach. By convening legal specialists, social scientists, ecologists and river managers throughout the co-production processes of our activities, we achieved a balanced set of recommendations that resonated across sectors and were relevant for river-relevant policies and strategies. This inclusive approach not only strengthened the content but also cultivated a network of experts committed to advancing our shared restoration goals.

Urban NBS DC

(Activity C4) Strategic contribution to policy alignment: The activity provided a focused and policy-relevant contribution by linking scientific evidence with a specific EU Biodiversity Strategy 2030 target (Target 14). This demonstrated the SSBD's ability to generate actionable knowledge tailored to real policy needs.

(Activity C4) Basis for Science-Policy Interface Development: By identifying where knowledge gaps intersect with institutional barriers, the activity reinforced the potential of the SSBD to act as a boundary organization—not just delivering knowledge but fostering cross-sectoral dialogue and mutual learning.

(Activity C5) Proactive policy scoping through informal engagement: Early, informal dialogue with key EU actors (JRC, KCBD, NetworkNature+) proved effective in surfacing strategic gaps and aligning the DC with real policy needs.

- **Weaknesses:**

Freshwater DC

(Activity B3) Translating technical science into accessible policy guidance: Boiling down rich ecological and hydrological research into clear, actionable guidance meant we had to constantly juggle the need for technical accuracy against the necessity of straightforward language. Bridging data gaps, preserving critical nuances and ensuring the text remained accessible to practitioners required careful, iterative editing and strategic simplifications.

- **Opportunities:**

Freshwater DC

(Activity B2 & B3) Every author helped share our findings (e.g., through conference talks, policy reports, news articles, and local stakeholder briefings) so our work reached both EU-level politicymakers and on-the-ground practitioners.

Urban NBS DC

(Activity C4) Evolving into a Systemic Change Facilitator: The review highlighted that many barriers to NBS are rooted in structural governance and institutional dynamics rather than knowledge deficits. This opens up an opportunity for the SSBD to broaden its role—from a knowledge broker to a strategic enabler of institutional alignment, policy integration, and long-term planning coherence.

(Activity C4) Enhancing NBS strategic framing and communication: The need to address competing planning priorities and policy incoherence suggests that the SSBD can play a catalytic role in shifting narratives and improving how NBS are communicated and positioned in policy debates.

- **Threats:**

Freshwater DC

(Activity B2 & B3) Complexity in aligning legal frameworks and stakeholder interests: Pulling together the Nature Restoration Law, Water Framework Directive and Habitats Directive, each with its own definitions, targets and reporting rules, while also addressing priorities that ranged from NGO conservation goals to operational concerns of water managers and policy-maker deadlines, made it difficult to reach a single, coherent set of recommendations.

(Activity B2 & B3) Concerns About Lobbying and Political Influence: The DC highlighted the risk that well-organized economic lobbying—particularly from sectors like hydropower and land use—could undermine the implementation of Article 9 of the Nature Restoration Law. This imbalance between evidence-based collaboration and political pressure poses a structural threat to science-informed policymaking.

Urban NBS DC

(Activity C4) Risk of over-reliance on project-based approaches: Urban NBS are often deployed in isolated, short-term projects rather than integrated into long-term planning. Without structural policy shifts, there is a risk that the SSBD's contributions remain peripheral to broader urban development agendas. To remain impactful, SSBD must push for the integration of NBS into long-term policy and planning frameworks.

(Activity C5) Risk of duplicating existing policy support mechanisms: With multiple actors already engaged in urban NBS (e.g., NetworkNature+, National Hubs, EC dashboards), the SSBD must be careful not to replicate efforts. Ongoing mapping of platforms and actor roles is essential. The SSBD should prioritize complementarity and added value when positioning its actions within the broader EU biodiversity governance ecosystem.

Activating topical networks

- **Strengths:**

Pollination DC

(Activity A4) Mobilisation of a network of paid (BioAgora) and unpaid voluntary experts**.**

(Activity A4) Targeted individual invitations explaining the scope, objective and outputs beneficial to their participation.

(Activity A4) Offer incentives (joint paper/policy impact production) to leverage participation.

Freshwater DC

(Activity B4) Targeted hybrid stakeholder convening: By building an online database of over 380 EU restoration projects tagged with information on legislation, habitats and contacts, we could hand-pick the ideal mix of river scientists, NGOs and DG ENV advisers for our events and activities, such as our hybrid River cluster meetings. This

ensured each session and activity brought together the right expertise to tackle emerging challenges, and it allowed us to include new members seamlessly.

(Activity B5) Policy-driven, interactive formats: Every workshop and special session that was organised by the Freshwater DC was explicitly structured around Article 9 of the Nature Restoration Law (as well as the WFD/Habitats Directive), giving participants a clear policy anchor for their discussions. Combining expert presentations with breakout groups, live polling and real-world case studies not only surfaced critical gaps in barrier-removal practice but also strengthened attendees' skills in co-producing actionable guidance.

(Activity B5) Elevated influence through external forums: Our active roles on advisory panels at large EU conferences (BioClim, SERE, EURO-INBO) and co-hosting of special sessions meant the DC outputs were repeatedly amplified to EU negotiators and practitioners. This consistent presence, coupled with policy-aligned briefing materials, resulted in invitations to contribute directly to National Restoration Plan drafting platforms and efforts.

Working through NGOs as policy mediators: Collaboration with NGOs such as WWF served as an effective bridge between science and policy. By co-developing recommendations, the DC translated scientific insights into policy-relevant language and tools, enabling the production of actionable and broadly accepted guidance.

Urban NBS DC

(Activity C6) Mapping key actors to build strategic networks: The mapping of the urban NBS community within NetworkNature+ helped identify well-established partners—such as ICLEI, IUCN, Oppla, and Biodiversa+—and understand how they contribute to the broader NBS landscape. The structured approach used (desk review, partner engagement, event participation) proved effective in revealing who is involved, what roles they play, and how collaboration is organized. This method can be reused by the SSBD to guide the development of other thematic networks and to avoid duplicating existing efforts by leveraging trusted actors and communities of practice.

(Activity C7) Multi-scalar reach of the urban NBS community: The mapping confirmed that urban NBS actors operate across all levels of governance—local, national, EU, and global. This reinforces the relevance of engaging stakeholders at different scales and offers the SSBD a tested entry point for building networks that reflect the multi-level nature of biodiversity governance.

(Activity C7) Urban NBS community's multi-sectoral character: With actors spanning policy, science, society, and business domains—and many operating at the interface of multiple sectors—this activity validated the cross-sectoral nature of the urban NBS landscape. This insight is critical for designing inclusive Knowledge Exchange Networks (KENs) within the SSBD.

(Activity C7) Strong on-the-ground participation from local and national actors: Many municipalities and national research bodies actively participated in DC activities, reflecting their willingness to contribute knowledge and experience. Their involvement highlights the SSBD's potential to tap into grounded expertise when addressing urban biodiversity issues.

- **Weaknesses:**

Freshwater DC

(Activity B4) Heavy lift on data and admin workflows: Pulling together project details from dozens of sources, and then cleaning, standardizing and updating them to feed our cluster's database, demanded constant back-and-forth with project teams, plus careful quality checks. This sizeable administrative overhead pulled team time away from analysis and other activities.

Balancing scientific rigour with policy and practice needs: The DC faced challenges in translating complex scientific insights into accessible guidance. Differences in conceptual frameworks and priorities between scientists and policymakers, combined with the need to balance analytical rigour with practical usability, required careful simplification and adaptation.

Urban NBS DC

(Activity C6) Limited visibility of urban-specific activities in a broader NBS scope: While NetworkNature+ is a comprehensive platform, its scope goes beyond urban contexts, making it harder to isolate urban-specific actors, needs, and resources. As a result, when the focus is on urban NBS, it can be challenging to identify relevant knowledge, contacts, or entry points tailored to cities.

(Activity C6 & C7) Dependence on interpersonal interactions to access network: The mapping of the urban NBS community relied heavily on informal, bilateral exchanges and event participation to access relevant information. While effective in the short term, this approach lacked structured institutional channels, limiting consistency, transparency, and the scalability of similar efforts across future SSBD activities.

(Activity C7) Limited representation of specific domains in the network: The mapping showed a strong focus on policy and science actors, while actors from Business & Finance (19%) and Society (42%) were significantly underrepresented. This imbalance may narrow the perspectives and types of expertise feeding into the SSBD.

- **Opportunities:**

Urban NBS DC

(Activity C6) Proven structures for inclusive and organized collaboration: NetworkNature+ offers well-tested mechanisms—such as its Task Forces, Project Board, and Regional Hubs—that bring together a wide range of actors from science, policy, business, and civil society. These structures have proven effective for fostering coordination, knowledge sharing, and joint action across levels and sectors. For the SSBD, these mechanisms provide a ready model for structuring thematic communities and supporting integrated collaboration in biodiversity governance.

(Activity C6) Strategic alignment with EU policy priorities and institutions: NetworkNature+ combines a well-structured thematic framework—grouping projects under six EU policy-relevant themes—with active coordination with key EU institutions such as DG RTD and DG ENV. This alignment works on two levels: through how the work is organized (clear thematic clusters linked to policy missions) and who is involved (close engagement with EU policy actors). This dual approach boosts the network's policy visibility, relevance, and credibility. This provides a concrete model to guide the selection of new Knowledge Exchange Networks (KENs) in ways that directly support EU strategies, such as the Biodiversity Strategy, Nature Restoration Law, or Horizon Europe Missions.

(Activity C6) Diverse knowledge resources supporting evidence use: NetworkNature+ offers curated and regularly updated knowledge tools—including databases of research projects, case studies, tools, and knowledge gaps—that support evidence-based policymaking and practice. These resources help structure knowledge in ways that are accessible and useful for different stakeholder groups. For the SSBD, this provides a strong foundation for the building the evidence base function and improving the integration of knowledge from across sectors and scales.

(Activity C6) Regional hubs as a model for decentralized engagement: The six NBS Regional Hubs function as stakeholder platforms at national and transnational levels, bringing together local actors, researchers, and policymakers. They help tailor knowledge exchange and capacity-building activities to local contexts. The SSBD can adopt this model to strengthen regional presence and ensure its activities reflect place-based priorities.

(Activity C6) Capacity-building and continuous learning as a core mission: NetworkNature+ provides training programs and user-focused platforms that help build knowledge and skills across policy, research, and practice communities. These efforts support not just information sharing, but long-term learning and institutional change. The SSBD should embed similar approaches to strengthen its support for capacity development and knowledge uptake.

(Activity C7) Entry points for strategic alignment with EU and global policy actors: The presence of high-level actors such as DG ENV, ICLEI, and the World Bank confirms the possibility of aligning future SSBD activities with broader EU and international biodiversity agendas.

(Activity C7) Mapping offers a strategic baseline for future stakeholder engagement: This activity delivered a structured overview of the urban NBS actor landscape, helping to identify gaps, overlaps, and potential synergies.

The SSBD can build on this to guide the formation of new KENs and tailor outreach strategies by domain and scale.

- **Threats:**

Pollination DC

(Activity A4) Time constraints of scientists, policy experts and other stakeholders make longer >1-day events increasingly difficult to produce and require investment in effort to make happen.

(Activity A4) Participant no shows on the day.

(Activity A4) Skepticism and fatigue among scientists and stakeholders.

Freshwater DC

Struggling with patchy monitoring data: Inconsistent or missing baseline metrics across member states limited our ability to develop fully data-driven recommendations in areas like long-term connectivity monitoring, underscoring the need for a more harmonized EU-wide data framework.

Limited engagement of key sectors and opposing stakeholders: The DC faced significant challenges in involving certain stakeholder groups, such as hydropower operators, infrastructure planners, and political actors with conflicting interests. Despite targeted outreach efforts, many declined participation or were unavailable due to scheduling conflicts. Their absence constrained the diversity of perspectives in the network and limited opportunities to explore trade-offs and build broader consensus.

Tension between ambition and capacity in activating networks: The DC experience highlighted that relationship-based outreach can be highly effective for activating topical networks. However, such approaches are difficult to scale without institutional support. Success depended on facilitation by EU-level intermediaries, underscoring the need for structured mechanisms that enable all DCs, regardless of capacity or existing networks, to engage effectively.

Urban NBS DC

(Activity C6) Potential fragmentation across knowledge tools and platforms: The mapping identified a wide range of tools, databases, and resources developed under NetworkNature+, but these are spread across platforms and projects with varying levels of integration. This fragmentation can make it difficult for users to navigate the landscape or get a full picture.

(Activity C7) Temporal limitation of project-based engagement: Many connections were built during a defined window of project activity. Without mechanisms for follow-up or ongoing relationship management, these ties may fade, limiting continuity and institutional memory in the SSBD.

(Activity C7) Risk of reinforcing existing silos or overlooking emerging actors: Without broader outreach or complementary mapping efforts, there is a risk that the SSBD will rely too heavily on familiar or well-established institutions, thereby missing newer, grassroots, or less-connected actors—especially in civil society and business sectors.

Capacity building & governance of topical networks

- **Strengths:**

Freshwater DC

(Activity B6) Practical, policy-aligned outputs supported learning and uptake: Organizing materials around Article 9 of the NRL, complemented by concrete examples from rivers, coastal lagoons, and wetlands, resulted in highly usable guidance. This enhanced immediate relevance for policymakers and facilitated knowledge uptake.

(Activity B6) Collaborative drafting improved legitimacy and usability: Joint development of recommendations with NGOs, IGB researchers, and policy advisors ensured that outputs were both legally robust and grounded in practical realities, strengthening trust and fostering uptake.

(Activity B6) Inclusive expertise ensured actionable guidance: The involvement of ecologists, legal experts, and practitioners in the co-creation process helped to balance technical accuracy with implementation needs.

(Activity B7) Terminological alignment increased policy relevance: Using consistent language across NRL, Water Framework Directive, and Habitats Directive ensured clarity and immediate policy applicability.

Urban NBS DC

(Activity C8) Comprehensive categorization of capacity needs: The analysis of interviews resulted in 18 distinct capacity need categories, organized into three overarching dimensions—individual skills, organizational capacities, and systemic factors. This provides the SSBD with a clear and structured framework to prioritize support actions.

(Activity C8) Validated relevance of co-creation and engagement: Experts from all sectors emphasized the central role of co-creation and engagement in effective NBS implementation and knowledge exchange. These insights reinforce the foundational role that participatory processes should play in the structure of SSBD topical networks.

(Activity C9) Role-play workshops work fairly well even with limited time and resources: The 1.5-hour workshop showed that even short, low-cost sessions can surface complex challenges and prompt deep reflections. This suggests that the SSBD can use similar formats to build capacity across different topics without needing large-scale events or extensive facilitation.

(Activity C10) Effective application of a structured learning framework: The Theory of Change framework from D2.3 provided a solid basis for structured dialogue and reflection. Its adaptability allowed participants to evaluate complex aspects of network functioning in a meaningful, step-by-step format.

(Activity C10) Culture of reflection and adaptive thinking in the network: NetworkNature+ showed openness to revisiting its goals, audiences, and strategies (e.g. through website redesign, national hubs).

- **Weaknesses:**

Freshwater DC

(Activity B6) Challenge of simplifying complex content: Translating technical hydrological and ecological insights into accessible, policy-oriented guidance required extensive editing. Revisions were necessary to strike a balance between scientific accuracy and clarity for non-specialist audiences.

Urban NBS DC

(Activity C9) Uncertainty in participant recruitment and diversity: Because the workshop was hosted within a larger conference agenda, the session was subject to pre-assigned time slots and room allocation, which limited flexibility in design and delivery. This constraint affected group size, duration, and the potential to adjust the format based on participant needs. Relying on open conference registration made it difficult to guarantee a balanced mix of participants in advance.

(Activity C9) Short session time restricted depth of engagement: With only 1.5 hours available, the workshop could not fully explore the complexity of the simulated scenario. Time constraints limited the depth of stakeholder interactions and reflection, especially during the group deliberation phase.

(Activity C9) Lack of structured follow-up to assess long-term impact: While the workshop generated valuable discussion and immediate feedback, there was no formal mechanism to track participant learning outcomes or continued engagement. Without tools for post-event evaluation or follow-up contact, opportunities to assess the workshop's influence on future practices—or to build on emerging networks—are lost**.**

(Activity C10) Insufficient internal coordination mechanisms: Despite NetworkNature+ engagement with key partners (e.g. ICLEI, IUCN), joint decision-making is limited. The General Assembly does not provide the depth or continuity needed for strategic alignment. The SSBD should explicitly support governance development within networks, including tools for collective strategy-setting and conflict navigation.

(Activity C10) Underdeveloped strategy for inclusive engagement: While NetworkNature+ brings together a broad range of institutional actors, its current membership and engagement practices remain relatively homogeneous—dominated by EU-based, like-minded organizations. Efforts to reach marginalized groups, diverse cultural perspectives, or more critical and dissenting voices (e.g., grassroots actors, private sector challengers, non-European stakeholders) are limited and not systematically embedded in the network's design. Inclusion

cannot be achieved by default through broad affiliations; it requires intentional strategies, active outreach, and dedicated resources. The SSBD should support networks in developing structured inclusion plans—offering tools, guidance, and incentives that help embed diverse perspectives and participation from underrepresented groups into the core of network governance and activities. This is essential for building legitimacy, relevance, and transformative capacity.

(Activity C10) Ambiguity for engaging with power and resistance: While NetworkNature+ engages in collaboration and challenge, it lacks a clear framework for deciding when to confront or disrupt entrenched systems and interests. The SSBD should help networks analyze power relations and adopt context-sensitive engagement strategies (collaboration, challenge, disruption).

- **Opportunities:**

Freshwater DC

(Activity B7) Momentum for network consolidation: Many existing river restoration networks showed readiness to align under the European River Cluster model, offering a foundation for scaling capacity-building efforts and reinforcing network cohesion.

(Activity B7) Enabling critical reflection and responsibility: Networks can play a transformative role by not only sharing knowledge, but also framing political dimensions of ecosystem degradation and encouraging institutional responsibility.

Urban NBS DC

(Activity C8) Embedding immersive and transdisciplinary formats into capacity building: Experts stressed the need to move beyond traditional webinars and promote more immersive formats like summer schools, and collaborative workshops. These approaches can enhance co-production, inclusion, and systems thinking within the SSBD.

(Activity C8) Leveraging existing practices and platforms: The interviews surfaced good practices such as EC internal workshops, the NetworkNature Task Forces, NbS hubs. These can inform the setup of topical networks and support functions in the SSBD.

(Activity C9) Scientists need support to engage with the political side of NBS: Participants appreciated when science contributed more than just facts—by acknowledging power dynamics and justice issues in NBS planning. This points to the need for training scientists to reflect on their role in shaping not only knowledge, but also values and decisions.

(Activity C9) Validated workshop to promote inclusive stakeholder engagement: The format allowed participants to step into unfamiliar roles, such as vulnerable residents or business actors, fostering empathy and revealing how easily certain voices are overlooked. For the SSBD, this serves as a valuable tool to train actors in more inclusive stakeholder engagement.

(Activity C10) Demand for cross-network peer learning: Participants expressed interest in engaging with other networks for mutual learning and outcome reflection. The SSBD can position itself as a convener of cross-network exchanges, helping spread practices and evaluate transformative progress.

(Activity C10) Strategic influence through policy-aligned outputs: NetworkNature+ has produced high-impact outputs—such as the NBS Roadmap—that have successfully aligned with EU policy agendas and contributed to increased funding and visibility for NBS. The SSBD should support networks in shaping outputs that are not only evidence-based but also strategically timed and framed to resonate with evolving policy narratives (e.g. nature-positive economy, green transition).

- **Threats:**

Freshwater DC

(Activity B6) Limited monitoring data availability: Inconsistent or insufficient standardized data, particularly for long-term monitoring, constrained the robustness of certain recommendations.

(Activity B7) Policy misalignment and lobbying pressure: Proposals to dismantle barriers and restore free-flowing rivers risk clashing with energy priorities under the Renewable Energy Directive. The presence of powerful lobby groups advocating for hydropower infrastructure poses a serious obstacle to restoration objectives.

(Activity B7) Cross-sectoral integration challenges: Integrating diverse perspectives—such as land use planning, cultural heritage, and climate adaptation—into debates on river restoration proved complex, especially when existing institutional frameworks and discourses remain fragmented.

Urban NBS DC

(Activity C8) Unequal access to NBS capacity-building opportunities: Smaller organizations, local actors, and those outside EU-level networks often lack the institutional and financial support needed to take part in training and collaboration. This risks their underrepresentation in SSBD activities and may undermine the inclusiveness and effectiveness of its networks.

(Activity C8) Limited representation from the business domain: Despite efforts to include diverse stakeholder types, business and finance actors were underrepresented in the interviews. This limits the breadth of perspectives captured and may leave key economic dimensions of NBS capacity needs insufficiently addressed.

(Activity C10) Difficulty in evaluating long-term transformative change: Outcomes such as policy shifts, cultural change, or new governance paradigms unfold over long timescales and involve many actors. Because of this complexity, it is rarely possible to attribute such transformations directly to a single network's actions. The SSBD should promote evaluation approaches that help networks understand and demonstrate how they contribute to transformation — without needing to prove they caused specific outcomes. This includes using narrative evidence, learning-oriented reflection, and process-based indicators to understand how their work supports broader transformation over time.

Research prioritization

- **Strengths:**

Freshwater DC

(Activity B8) Broad engagement through a stepwise approach: The combination of an open call for input, expert workshop refinement, and structured prioritisation through ranking created a process that was both inclusive and focused. This layered method built trust in the final outcomes and gave legitimacy to the research agenda.

(Activity B8) Bridging ecological and societal needs: We deliberately tried to reach a broad range of stakeholders in our river restoration network of networks (natural and social scientists, practitioners and policy advisors), to ensure that both natural-science and social-science questions were included in our study. The result is a research agenda that speaks to habitat connectivity and fish biology as well as governance, funding and community engagement.

(Activity B8) Clear, engaging deliverables: Translating our findings into vivid ranked charts, correspondence-analysis diagrams and maps of topic relevance made the results easy to grasp. These visuals turned hundreds of raw suggestions into a user-friendly roadmap that resonates with researchers, funders and decision-makers alike.

Urban NBS DC

(Activity C11) Consensus on key themes for ambitious plans: Experts converged on four priority themes—biodiversity, ecosystem conditions, cultural/recreational services, and climate adaptation—which are broadly aligned with EU policy objectives. This validates the method's capacity to surface shared strategic priorities.

(Activity C11) Strengthening practitioner networks: The process established new collaborations with municipalities, which not only enriched the Expert panel for Ticket 27 but also strengthened the Science Service's ability to respond to policy requests with place-based and practice-informed insights.

- **Weaknesses:**

Freshwater DC

(Activity B8) Disciplinary imbalance required corrective effort: With over 80% of respondents coming from natural-science backgrounds, we had to work deliberately to lift up social-science and policy perspectives. This meant additional outreach and careful framing to ensure those insights were heard and integrated.

(Activity B8) High resource demand for data processing: The process of collecting 714 questions, cleaning and clustering them into 425 unique topics, then narrowing to 27 priorities required significant coordination, editorial effort, and time investment.

(Activity B8) Participant drop-off during multi-stage process: Some early contributors did not continue to the ranking phase, indicating fatigue or lack of sustained engagement.

Urban NBS DC

(Activity C11) Ambiguity in gap typology: The survey revealed relevant practitioners needs but did not always differentiate the nature of those needs (e.g, scientific knowledge gaps, capacity constraints, or governance barriers) and priorities clearly enough to inform targeted responses. This ambiguity limited the precision of the results in guiding targeted SSBD support.

(Activity C11) Challenges in gap analysis: Because the survey relied mainly on open-ended questions, the identification of gaps required subjective interpretation, which may have introduced bias in selecting and framing issues addressed in the second round.

(Activity C11) Sustaining expert participation in time-intensive processes: Sustaining participation was difficult due to the time commitment required. The lack of direct incentives, especially for local practitioners balancing competing tasks, led to drop-off and required repeated reminders.

- **Opportunities:**

Urban NBS DC

(Activity C11) Expanding Delphi as a support tool for bridging policy and practice: The Delphi's feedback-based structure promoted critical reflection on policy guidance and cross-learning among planners. There is clear potential to institutionalize this reflective exchange within SSBD practices.

(Activity C11) Indicator development and piloting: The Delphi process led to a comprehensive inventory of indicators—many proposed by planners beyond the official guidance. This opens a pathway to co-develop and validate new context-relevant, practitioner-endorsed indicators—particularly for ecosystem conditions and climate adaptation—where gaps in current practice were most evident.

(Activity C11) Improving gap classification: Future Delphi rounds could prompt experts to explicitly categorize and prioritize their needs. Differentiating between research, capacity-building, and policy implementation gaps would enable more tailored responses from the Science Service.

- **Threats:**

Freshwater DC

(Activity B8) Limited policy engagement: Despite policy relevance, few political or institutional policymakers engaged with the process, posing a risk to the uptake and application of the research priorities.

Urban NBS DC

(Activity C11) Limited reach beyond EU project circles: Involving municipalities with no prior EU project experience proved challenging. The need to rely on DC leads' networks to secure participation may have introduced biases and limited the diversity of perspectives represented.

(Activity C11) Outdated or incomplete contact data: Locating and reaching the right experts was hampered by missing contact information in NBS databases and municipal websites. This poses an operational barrier to applying the method efficiently.

(Activity C11) Overloaded municipal agendas: Municipalities' simultaneous involvement in multiple EU initiatives restricted their capacity to engage in BioAgora activities. This saturation may hinder sustained collaboration unless better alignment across projects is achieved.

Feedback to policy frameworks

- **Strengths:**

Pollination DC

Multi-channel dissemination to policy: Feedback was delivered through several policy-relevant venues, including a formal presentation to the EUBP WGP, a stakeholder-facing report sent to key institutions, and a public session at the European Week of Regions and Cities.

Freshwater DC

(Activity B10) Stakeholder-driven policy inputs: By weaving our research priorities directly into webinars and conference presentations where NGO policy advisors and DG ENV representatives were present, we made sure our work fed into the drafting of NRP. Involving policy advisors at every stage, from the Free Flow workshop and webinars through to the review of final manuscripts and reports, built shared ownership and eased the path from our recommendations into real-world policy drafts.

(Activity B10) Accessible outputs enhanced communication of complex priorities: Complex findings were translated into concise formats—such as alignment matrices linking research priorities to NRL Article 9 and WFD objectives—alongside clear executive summaries. These accessible materials enabled rapid uptake of critical research gaps by policymakers.

Urban NBS DC

(Activity C14) Enhancing responsiveness through participation in EUBP Working Groups: Participation in the EUBP Working Group on Green Infrastructure allowed keeping track not only of higher-level policy debates (i.e., issues discussed in general EUBP meetings) but also of the practical knowledge needs related to the implementation of specific policies (e.g., monitoring and reporting mechanisms).

- **Weaknesses:**

Freshwater DC

(Activity B10) Participant engagement and disciplinary imbalance: Sustaining engagement over time was difficult due to respondent fatigue and limited participation from political stakeholders. The process was also heavily weighted toward natural sciences, requiring targeted efforts to elevate social science and policy perspectives.

(Activity B10) Trade-offs between scientific depth and policy brevity: Crafting guidance that was scientifically robust yet brief enough for policy briefs meant tough editorial choices, simplifying methodological nuance while still providing enough context for decision-makers.

(Activity B10) Coordination complexity in multi-actor processes: Managing successive comment rounds between NGOs, IGB scientists, and policy advisors, each with their own calendars and review processes, demanded a dedicated coordination effort and clear communication channels to ensure timely, coherent inputs at every stage of the writing of policy documents and manuscripts.

- **Opportunities:**

Pollination DC

Expanding the collaborative model for broader policy feedback: The collaborative model used with H2020 Safeguard creates momentum for future science-policy workshops that could deepen the participatory feedback loop and inform other EU policy frameworks.

- **Threats:**

Pollination DC

Risk of non-institutionalized feedback processes: Without sustained mechanisms to integrate such science-policy interactions into policy cycles, feedback may remain ad hoc rather than a systematic part of evidence-informed decision-making.

Urban NBS DC

(Activity C14) Misalignment Between SSBD Activities and EUBP working groups: Priority topics of the working group might not always align with relevant activities conducted by the SSBD, which might lead to conflicts in the agenda if working groups are identified as potential audiences for the SSBD results. A stronger coordination with the working group leaders - beyond the simple participation as observers - is required for the SSBD to seize all the opportunities offered by these platforms.

Building the evidence base

- **Strengths:**

Freshwater DC

Integrating diverse pan-European datasets: By merging IUCN range maps, AMBER and DRE barrier inventories, and the EU-Hydro River network, we created a harmonized geospatial framework that underpins the recommendations from our work. This multi-layered approach allowed us to pinpoint high-impact barrier removals with confidence and produce maps and indices ready for policy use.

Co-development with practitioner partners: Involving Dam Removal Europe and Wetlands International at every stage—from refining the Migratory Fish Vulnerability Score to selecting case studies—ensured our methods and outputs reflect real-world priorities and constraints. Their feedback turned abstract metrics into compelling, field-tested evidence that resonates with both conservation NGOs and government agencies**.**

Urban NBS DC

(Activity C15) Using requirements to encourage participation: EU-funded projects were explicitly required to contribute to the clustering activities of NN+.

(Activity C15) Building on existing tools: The NetworkNature+ Task Force 1 activities build on existing outputs (e.g., the handbook) and platforms (i.e., Oppla) and respond to needs that are perceived as relevant by both the EC and the project partners.

(Activity C15) Producing tangible outputs to drive engagement: The activities lead to tangible outputs, which boost interest and engagement.

- **Weaknesses:**

Freshwater DC

Maintaining relevance across scales was difficult: Continental-scale assessments risk overlooking local nuances, while fine-scale analyses can’t easily be rolled out Europe-wide. Balancing a coherent, Europe-wide perspective with the specific needs of individual river basins proved a constant challenge.

Technical complexity and resource demands: Building and maintaining large geospatial pipelines, snapping hundreds of thousands of barriers to river networks, calculating multi-criteria indices, and visualizing high-resolution maps, required specialized GIS expertise and significant computational effort.

- **Opportunities:**

Urban NBS DC

(Activity C15) Thematic focus supports effectiveness: Part of the success of NN+ activities is due to the relatively limited thematic focus and clear objectives. Replicating the same approach for broader topics (e.g., biodiversity) and more general objectives (e.g., building an evidence base) is more challenging.

- **Threats:**

Freshwater DC

Data gaps and quality issues required extensive processing: Incomplete species and barrier metadata necessitated careful validation and confidence scoring, while harmonizing large-scale GIS layers and developing custom indices demanded significant technical effort.

Urban NBS DC

(Activity C15) Need for sustained institutional backing: Long-term commitment of the EC is needed for the success of activities aimed at building an evidence base.

(Activity C15) Managing participation dynamics: Ensuring long-term participation engaging new contributors through time requires flexibility in adapting activities and modes of collaboration to changing interests and needs.