



PART OF THE

EU MISSIONS

RESTORE OUR OCEAN & WATERS

Funded by
the European Union



**Ecosystem-based governance with Danube lighthouse
Living Lab for sustainable innovation processes**

**Accelerating transformative
innovation for healthy waters in
the Danube and Black Sea
Region**



**DANUBE &
BLACK SEA
LIGHTHOUSE**

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This brochure summarises the work of the EcoDaLLi project. It covers the objective of each workpackage, highlights their key outputs and reflects on challenges, learnings and the contribution to the projects legacy. Results can accessed by clicking (online version only) or scanning the QR codes.

1 Introduction

Our rivers and seas are essential for life, but they are under increasing pressure from pollution, climate change and biodiversity loss. To protect these vital ecosystems, the European Union has launched the Mission “Restore our Ocean and Waters by 2030.” Its goal is simple: to bring Europe’s waters back to a healthy state and make them more resilient for future generations.

EcoDaLLi supports the EU Mission “Restore our Ocean and Waters by 2030” by helping protect and restore freshwater ecosystems in the Danube and Black Sea region. As part of the Danube & Black Sea Lighthouse, the project connects people, knowledge and innovation to develop practical solutions through cooperation, governance and Living Labs. By linking local action with European goals, EcoDaLLi contributes to healthier waters, stronger communities and a more sustainable future.

1.1 MISSION OCEAN AND WATERS

The EU Mission “Restore our Ocean and Waters by 2030” aims to protect and restore Europe’s marine and freshwater ecosystems while reducing pollution and supporting a carbon-neutral, circular blue economy.

Mission Lighthouses

Atlantic &
Arctic

Baltic &
North Sea

Mediterranean

Danube &
Black Sea

To turn this ambition into action, the Mission works through four “Lighthouses” – large-scale innovation areas where solutions are tested, demonstrated and prepared for wider use. One of these is the Danube & Black Sea Lighthouse, which brings together projects and partners to develop practical approaches for healthier waters, stronger biodiversity and more resilient communities.

1.2 Danube and Black Sea Lighthouses

In the Danube and Black Sea Lighthouse EcoDaLLi covers the role of the Coordination Support Action (CSA), with a focus on connecting and building governance structures. The technical aspects of restoration are carried out by the current nine Innovation Action (IA) projects and one Research Innovation Action (RIA), each with its own focus area.



**Freshwater
focus:**



**Wetland
focus:**



DaWetRest



Restore4Life

RESTORING WETLANDS
FOR A SUSTAINABLE FUTURE



**Sediment
focus:**



sundanse

Sustainable Sediment solutions for
the Danube - Black Sea system



**Fish habitat
focus:**

Danube
lifelines



Lighthouse coordination (CSA)



Additional RIA support

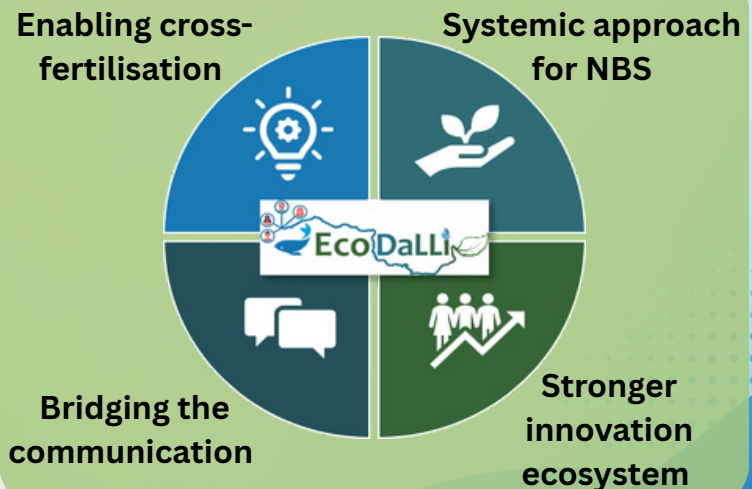


SOS2LearnDBS

Danube - Black Sea

1.3 Role and Scope of EcoDaLLi

EcoDaLLi (2023–2026) stands for “*ECOsystem-based governance with DAnube lighthouse Living Lab for sustainable Innovation processes.*” With 17 partners and one associated partner from 11 countries, EcoDaLLi helped strengthen and connect governance structures in the Danube basin to accelerate innovative solutions for ecological restoration, protection and conservation, supported by a well-connected Living Lab system that builds a stronger innovation ecosystem.



2. NBS & eco-system connectivity for the protection and restoration of freshwater ecosystems and biodiversity

Objectives:

- Develop and apply a Mission-relevant methodology for assessing Nature-Based Solutions
- Showcase implemented best practices across the four Danube units (upper, middle, lower and delta), with emphasis on connectivity, restoration and replicability
- Translate the evidence into policy recommendations and validate them with stakeholders through regional workshops



What are Nature-Based Solutions?

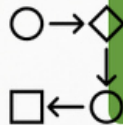
“solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and interventions. Nature-based Solutions must therefore benefit biodiversity and support the delivery of a range of ecosystem services”

From: [European Commission: European Research Executive Agency, Nature-based solutions – EU-funded NbS research projects tackle the climate and biodiversity crises, Publications Office of the European Union, 2025.](#)

2. NBS & eco-system connectivity for the protection and restoration of freshwater ecosystems and biodiversity

A clear sequence from assessment methodology to validated recommendations

Translation of restoration knowledge into tools that can be used by policymakers, practitioners and innovators.

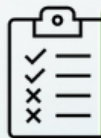


Methodology for NBS assesment



Catalogue of NBS

Outputs are not only desk-based; they were tested with stakeholders and adjusted to implementation constraints.



Policy Recommendations



Validation

2. NBS & eco-system connectivity for the protection and restoration of freshwater ecosystems and biodiversity

Outputs

D2.1 Methodology for Mission relevant NBS assessment



The methodology designed as assessment tool and NBS literacy resource for different users.

D2.2 NBS catalogue of implemented best practices



Funded by
the European Union

Demonstrates what can be learned from implemented NBS across the Danube Basin.

D2.3 Policy recommendations for NBS Implementation



Addressed technical, governance, financial and knowledge barriers. Emphasised local context, co-creation, monitoring and evidence generation.

2. NBS & eco-system connectivity for the protection and restoration of freshwater ecosystems and biodiversity

Challenges

- Heterogeneous data across NBS projects
- Different governance systems across Danube units
- Broad stakeholder engagement in a large basin



Lessons



- effective NBS implementation is as much a governance and financing challenge as it is a technical restoration challenge
- address challenges through methodology, validation and policy framing - not as deviations

Legacy

- validated NBS pathway from knowledge to implementation support



3. Innovative practices in spatial policies for the protection and restoration of freshwater ecosystems and biodiversity

Objectives:

- Establish the Danube-Black Sea Lighthouse as a key point for exchange & learning on innovation in biodiversity, water systems & climate change for the river cities & cross-border actors
- Set up the scene for an improved local potential for innovation & innovation upscaling as well as an improved potential for citizen engagement

Achievements

- Innovative solutions inventory for city-river interactions & Stakeholders Mapping
- Stakeholder-tailored knowledge co-creation & engagement
- Setting up the EcoDaLLi Local panel
- Ecosystem impact assessment for transformations of urban land-uses (integrated spatial policies for river-cities & cross-border areas)

3. Innovative practices in spatial policies for the protection and restoration of freshwater ecosystems and biodiversity

9 innovative ecosystem-based practices identified and documented



Mapping of innovative ecosystem-based practices in local, cross-border, transnational spatial policies in the 4 territorial units (Upper, Middle, Lower & Delta), and at watershed/basin level, of Danube River basin.

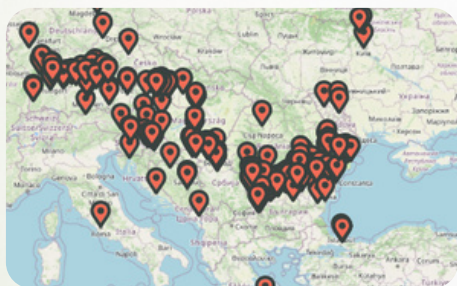
Shared vision on spatial policies for the protection and restoration of freshwater ecosystems and biodiversity in the Danube river basin and its Delta



A basis for future spatial policies supporting freshwater ecosystem restoration and biodiversity.

3. Innovative practices in spatial policies for the protection and restoration of freshwater ecosystems and biodiversity

Stakeholder database



Can be reused for future engagement, Living Labs, and cross-project collaboration.

Proposals for innovation potential, innovation up-scaling, on citizen engagement techniques

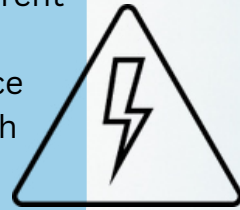


Provides a set of evidence-based recommendations, drawn from workshops, surveys, and expert input, to strengthen innovation capacity, scale up solutions, and enhance citizen engagement in ecosystem restoration across the Danube region.

3. Innovative practices in spatial policies for the protection and restoration of freshwater ecosystems and biodiversity

Challenges

- Heterogeneity across areas (different needs, priorities, capacities)
- Stakeholder engagement imbalance (e.g. lower participation of research sector in the first round of stakeholder workshops)



Lessons



- Workshops in different geographical areas and tailored stakeholder engagement to adjust to heterogeneity
- Targeted invitation improve stakeholder balance

Legacy

- A ready-to-use spatial policy platform for continued Danube and Black Sea cooperation



4. Danube river basin Lighthouse governance and networking

Objectives:

- Build cross-border Living Lab communities for knowledge sharing
- Develop and test the PLLS (Practices Living Lab System) across 4 Danube regions
- Co-create action-oriented knowledge for governance
- Facilitate dialogue on the Lighthouse Implementation Charter

Definition of Living Labs in EcoDaLLi:

“not physical places, but interactive systems of tools, stakeholders and processes. They enable co-creation by involving stakeholders directly in identifying problems and developing solutions”

Main goal: enable cross-border Living Labs for sustainable Danube governance.

4. Danube river basin Lighthouse governance and networking

EcoDaLLi Living Labs



Innovation
Ecosystem



Climate
Change



Water
Systems



Biodiver-
sity



Applied and tested different engagement formats across the Danube regions to adapt to diverse governance structures and cultural contexts.

4. Danube river basin Lighthouse governance and networking

Practice Living Lab System

Practices Living Labs System (PLLS) is a structured tool that supports Living Lab activities by collecting and organizing stakeholder information. It helps project partners identify the right people to involve, understand stakeholder needs, define priorities, and discover opportunities for cooperation.

Key role of PLLS:

- Brings the right stakeholders into the discussion
- Collects data through questionnaires and engagement activities
- Identifies needs, priorities, and cooperation opportunities
- Supports analyzing and structuring information
- Turns stakeholder input into practical advice and follow-up actions



PLLS is not only a project tool, but a reusable framework for long-term governance, restoration, innovation, and sustainable development.

4. Danube river basin Lighthouse governance and networking

Outputs

Living Lab Roadmap



Gaps and needs analysis:
knowledge base for more targeted
policy and governance discussions.

Living Lab Concept



Stakeholder engagement: practical
mechanisms adapted to diverse
governance and cultural contexts.

Practice Living Lab System (PLLS)



Supports Living Lab organisation,
stakeholder mapping and process
improvement.

4. Danube river basin Lighthouse governance and networking

Challenges

- Diverse governance structures across regions
- Uneven stakeholder engagement levels
- Limited resources and funding continuity



Lessons

- Need for strong cross-border coordination
- Communities must act as co-creators
- Flexible, context-specific approaches are essential



Legacy

- Lasting networks: cross-border communities
- Knowledge for governance: evidence and dialogue formats for policy learning
- Reusable framework and tools: transferable methods for other Lighthouse & restoration projects



5. Fostering a strong innovation ecosystem for the protection and restoration of freshwater ecosystems and biodiversity

Objectives:

- Support the transfer, replication & wider dissemination of innovations addressing freshwater ecosystem restoration.
- Develop resources for innovators in the region
- Strengthening capacity for relevant stakeholders trainings
- Paving the way to upscaling: conditions, strategy, infrastructures and mechanisms

Resources



Catalogues of services



The guidebook

Analysis



Promising innovations



Challenges to upscaling



Upscaling in real life

People



Trainings



Collective evaluation

5. Fostering a strong innovation ecosystem for the protection and restoration of freshwater ecosystems and biodiversity

The Scalability of Nature-based Solutions

Strengths and Opportunities of NBS

- They address pressing environmental and societal challenges
- Technological maturity
- Favorable policy environment: Internationally recognised and embedded in EU policies and strategies
- Flexible and cost effective – Multiple benefits provided
- Growing recognition as investment opportunities



Challenges of NBS

- Conceptual clarity, monitoring and measurement gaps
- Planning and implementation barriers
- Some long term, non-market benefits are sometimes difficult to quantify
- Policy and governance practice alignment (national level)

5. Fostering a strong innovation ecosystem for the protection and restoration of freshwater ecosystems and biodiversity

Upscaling in Real Life

Enablers

Governance structures

Stakeholder engagement

Institutional anchoring

Funding

Administrative complexity

Financial viability constraints

Fragmented funding systems

Transaction and implementation costs

Barriers



Upscaling does not happen in barrier free environments!

Even upscaled cases show substantial barriers. Successful projects manage barriers – they do not eliminate them.

5. Fostering a strong innovation ecosystem for the protection and restoration of freshwater ecosystems and biodiversity

Outputs

Catalogue of Business Innovations



Helps to identifies and connects (potential) innovators with relevant financing parties.

Guidebook to Support Innovation in Ecosystem Restoration



Designed to help innovators, support organisations, and key actors navigate innovation-related challenges and identify practical support services that can accelerate the development of ecosystem restoration solutions.

5. Fostering a strong innovation ecosystem for the protection and restoration of freshwater ecosystems and biodiversity

Outputs

**Webinar “Surfing the innovation stream”
and other online trainings**



Support for innovators covering information on FAIR data principles, involvement of the private sector in ecosystem restoration, upscaling, governance structures and more

**Report on upscaled
innovations**



A qualitative analysis of 68 case studies in the Danube and beyond, to identify promising Innovations and common challenges to upscaling

5. Fostering a strong innovation ecosystem for the protection and restoration of freshwater ecosystems and biodiversity

Challenges

- The innovation jargon does not always “speak” to stakeholders involved in ecosystem restoration
- Innovation actors (e.g. incubators) are used to deal with other sectors (e.g. technological start-ups)
- Bridging the two worlds and raising stakeholders’ interest, can be challenging



Lessons



- Innovation in ecosystem restoration: Bridging languages, people, worlds
- creating a common ground, first of all by “translating” the innovation language to make it fit for ecosystem restoration

Legacy

- Resources for innovators
- Trainings and collective evaluation for stakeholders.
- Upscaling analysis and lessons learned



6. EcoDaLLi Portal Implementation for better cross-fertilisation of achieved results

Objectives:

Cross-Fertilisation and Innovation: Share activities, models, and innovations developed in previous tasks across the Danube River basin



Knowledge Transfer and Awareness: Disseminate information on ecosystem preservation and restoration to stakeholders, enhancing awareness of key issues

Sustainable Development Solutions: Provide practical solutions for sectors to harness economic benefits from sustainable development practices



How:

- Development of interactive portal for stakeholders' inclusion
- Custom made space for citizen-governance connection
- Identification of synergies with related Mission Implementation Portal

6. EcoDaLLi Portal Implementation for better cross-fertilisation of achieved results

Outputs

EcoDaLLi Portal



EcoDaLLi Online Interactive Portal developed as the central hub for project results, tools and stakeholder resources.

Catalogue of Innovation Action Solutions



 **Submit a New Solution**

Practical, science-backed solutions developed through Mission Ocean Innovation Action projects. New solutions can be submitted

Content Catalogue for Stakeholder Engagement



Stakeholder engagement tools to support feedback, participation and co-creation.

6. EcoDaLLi Portal Implementation for better cross-fertilisation of achieved results

Challenges

- Making citizen–governance interaction practical and meaningful
- Avoiding duplication with other Mission Ocean platforms.
- Securing governance-sector uptake



Lessons



- Technical results need to be translated into simple, stakeholder-oriented formats.
- Governance engagement requires direct outreach, not only online tools.

Legacy

- EcoDaLLi outputs are structured, centralised and made available for future users
- The portal supports evidence-based decision-making by giving governance actors access to policy-relevant tools, best practices, stakeholder inputs and Mission Ocean-aligned resources.

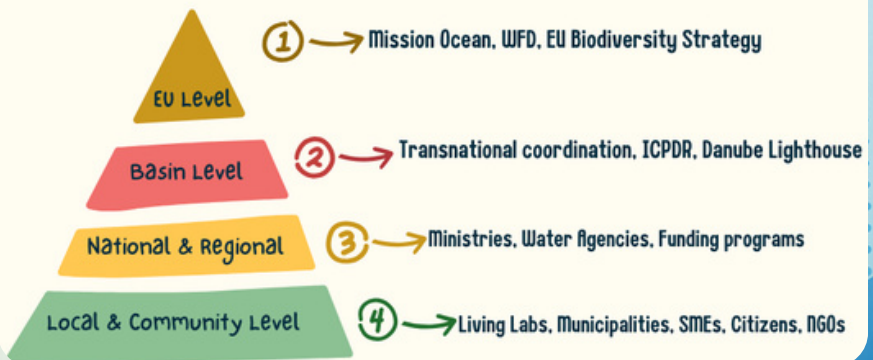


7. Danube Innovation Strategic Action Plan

Objectives:

- Deliver a detailed Innovation Action Plan, a tool that can support the Mission to consolidate the Danube and Black Sea Lighthouse
- Establishment of the lighthouse implementation charter, ensuring its political commitment to the implementation of the lighthouse & helping reach of the Mission Ocean Goals

Multi-Level Governance Framework in the Danube Basin



7. Danube Innovation Strategic Action Plan

A set of strategic outputs was developed:

- an Action Agenda for freshwater ecosystem protection and restoration,
- a monitoring framework,
- a long-term Danube Lighthouse Vision,
- and an Innovation Action Plan showing how governance, restoration, finance, skills, data and innovation can support future action across the Danube and Black Sea region.

6 pillars as the foundation of a practical compass to move from pilot innovation to systemic, basin-wide transformation



Integrative Danube
basin management



Nature-based
solutions at scale



Co-creation and
capacity building



Finance and invest-
ment mechanisms



Replication and
upscaling



Data sharing and
monitoring

For each pillar, key challenges, strategic actions, supporting tools, KPIs, and lessons learned were identified

7. Danube Innovation Strategic Action Plan

Outputs

Action Agenda for Freshwater Protection and Restoration:



**ACTION AGENDA
FOR FRESHWATER
ECOSYSTEM
PROTECTION AND
RESTORATION IN
THE DANUBE
LIGHTHOUSE**

01

Ecological S
Resilien

02

Biodive

03

Data-driven &
Participatory Governance

04

Innovation Uptake &
Scaling

Operational framework for
freshwater ecosystem protection
and restoration with five Priority
Action Packages

Monitoring Framework

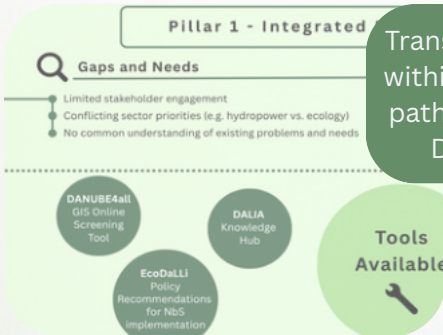


Provides the foundation for
consistent, Mission-aligned
monitoring of Danube Lighthouse

7. Danube Innovation Strategic Action Plan

Outputs

Danube Innovation Action Plan



Translates the strategic vision developed within EcoDaLLi into concrete innovation pathways for implementation across the Danube and Black Sea River Basin

Danube Lighthouse Vision

Linked to strategic objectives of the Mission; defines shared future for the Danube and Black Sea region; sets strategic directions and long-term transformation logic

6. EcoDaLLi Portal Implementation for better cross-fertilisation of achieved results

Challenges

- Transboundary nature of the Danube Region makes coordination, alignment and long-term ownership a central challenge.



Lessons



- Protecting the Danube needs a shared direction and stronger cooperation between all sectors
- Innovation goes beyond technology, from governance models, NbS, financing mechanisms, monitoring tools to citizen engagement

Legacy

- Coherent foundation for continued action in the Danube Lighthouse beyond the EcoDaLLi project
- Foundation of the Danube Lighthouse as a long-term cooperation space that connects countries, sectors and communities around the common goal



HORIZON-MISS-2021-OCEAN-02 (Protect and restore marine and fresh water ecosystems and biodiversity)

Danube Lighthouse Coordination and Support Action

Project duration: 42 months (01/23 – 06/26)

Project Budget: €2,684,875.00

Consortium: 17 Partners & 1 Associated Partner from 11 countries

Coordinator: Steinbeis Europa Zentrum



Federal Ministry
Republic of Austria
Agriculture, Forestry, Regions
and Water Management

