eNaBLS

Education and NBS -
bending the curve for biodiversity

Engaging with Biodiversity and Nature-Based Solutions in Education - Activity Toolkit

Funded by
the European Union

Publication Information

Title	Engaging with Biodiversity and Nature-Based Solutions in Education - Activity Toolkit
Authors	Nandni Shah (https://orcid.org/0009-0009-7192-8280) Ann-Catrin Fender (https://orcid.org/0000-0003-0491-3037)
Reviewers	Sabiha Gökçen Zwack (https://orcid.org/0000-0000-6488-2098) Katharina Prielinger (https://orcid.org/0009-0002-2602-4097)
Brief summary	This publication presents an interactive educational toolkit designed to introduce biodiversity and Nature-Based Solutions (NBS) through the NBS101 Bingo activity. Framed within the Horizon Europe-funded ENABLS project, the toolkit supports transdisciplinary dialogue, reflection, and peer-to-peer learning across diverse educational and community settings. It offers detailed guidance for facilitators, including activity flow, materials, and adaptable formats. The resource aims to make NBS concepts more accessible, engaging, and relevant across disciplines and knowledge systems.
Publication date	27/06/2025
Edition	1st edition
Publisher	ENABLS
eNaBlS Work Package	WP3 – Living Labs in Action

Funded by the European Union

Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

© 2025 by ENABLS consortium is licensed under CC BY-NC 4.0. To view a copy of this license, visit https://creativecommons.org/licenses/by-nc/4.0.

Table of Contents

List of Figures

List of Tables

Table of Abbreviations

Abbreviation	Description
ENABLS	Enhancing Nature-Based Solutions for Biodiversity Learning in Higher Education and Vocational Training Systems
HEIs	Higher Education Institutions
IUCN	International Union for Conservation of Nature
LNL	Learn in Nature Living Lab
NBS	Nature-Based Solutions
TVET	Technical and Vocational Education and Training

Engaging with Biodiversity and Nature-Based Solutions in Education - Activity Toolkit

1. Introduction

'Climate Change', 'Biodiversity loss', 'Social inequity' aren't just textbook terms, but phenomena we experience in our everyday lives today. In this light, the conversation around sustainability has grown more urgent than ever, which comes with many intertwined challenges. One of these challenges is public knowledge and awareness. **How much of it do we really understand? Do we make enough conversations around us about these topics? and how do we even begin talking about it?** These are some questions that naturally arise in our minds when we start thinking of addressing this gap. While many sustainability efforts focus on technological innovation or carbon mitigation, among the core elements often overlooked in mainstream sustainability discourse are **Biodiversity** and **Nature-Based Solutions (NBS)**, concepts that link human wellbeing directly with the health of natural systems (Cohen-Shacham et al., 2016; Díaz et al., 2018; Seddon et al., 2020). To address the dilemma of which approaches to adapt for an engaging entry point into the concept of biodiversity and NBS, this publication offers an interactive and engaging tool for students and academic staff, and various stakeholders like local residents, industry practitioners, etc. from diverse disciplinary backgrounds.

1.1 What is Biodiversity?

Biodiversity, or the variety of life on Earth plays a critical role in supporting life-sustaining processes such as **pollination, nutrient cycling, and climate regulation at all – genetic, species, and ecosystem levels** (Cardinale et al., 2012). Its loss not only threatens species and ecosystems but also undermines food security, water availability, and disease resistance for human populations (Díaz et al., 2019). Yet, public awareness and understanding of biodiversity remain limited, and are often seen as abstract or disconnected from everyday life (Soga & Gaston, 2016).

1.2 What are Nature-Based Solutions (NBS)?

In response to growing ecological crises, NBS have emerged as an integrated approach that leverages the functions of healthy ecosystems to address societal challenges such as flooding, food insecurity, and urban heat while promoting biodiversity and human wellbeing (IUCN, 2020). Unlike traditional engineering solutions, NBS are inclusive by design, seeking to co-create benefits across environmental, social, and economic domains (Cohen-Shacham et al., 2016). They also open space for local participation and knowledge, which is essential for lasting and equitable impact.

Despite their potential, biodiversity and NBS are often under-represented in educational, policy, and community spaces, particularly in ways that are accessible to diverse groups. Many people, especially youth and urban populations, experience 'extinction of experience', a gradual loss of meaningful contact with the natural world which limits emotional connection and motivation for action (Pyle, 2003). Therefore, it is valuable to mainstream these concepts. Are biodiversity and NBS separate from sustainability topics? No! They in fact, form important pillars to achieve sustainability goals and therefore are much in need to be mainstreamed within civic, education, and policy spheres.

1.3 About the ENABLS Project

The **ENABLS** project is a Horizon Europe initiative that aims to mainstream nature-based solutions (NBS) and biodiversity-related education within Higher Education Institutions (HEIs) and Technical and

Vocational Education and Training (TVET) centres. It responds to the urgent need for interdisciplinary and applied approaches to address biodiversity loss, climate change, and sustainability challenges.

ENABLS promotes the integration of NBS across academic as well as technical and vocational education and training curricula and institutional practices by advancing a range of actions. These include the development of teaching modules, the implementation of campus-based NBS interventions, the facilitation of real-world experimentation through Living Labs, and the creation of open educational resources. The project engages students, educators, and societal stakeholders through a collaborative, and a transdisciplinary learning process.

A core feature of ENABLS is its use of the **Living Lab approach**, which emphasizes **co-creation, experimentation, and stakeholder involvement in real-life settings.** Within these living labs, participants work together to design, test, and evaluate NBS-based approaches, thereby bridging the gap between academic knowledge and societal application. This approach enables the development of context-specific, actionable knowledge while supporting the transformation of higher as well as vocational education towards greater ecological relevance and societal impact (Evans et al., 2015).

Further information about the project can be found at: www.enabls.eu.

1.4 Aim of the activity toolkit

The **NBS101 Bingo** activity was designed originally for a workshop format, and was developed as part of the ENABLS project under the **Learn in Nature Living Lab (LNL) at the University of Hohenheim**. This activity encourages participants to reflect on how NBS and biodiversity-related themes may connect to their own fields of study or professional practice.

This toolkit offers a structured guide to implementing the activity in higher education and living lab settings. **The method promotes interactive, peer-to-peer dialogue and supports transdisciplinary learning by encouraging participants to identify potential links between their disciplinary expertise and NBS principles.**

The activity is intended as a flexible and replicable tool that can be adapted to different academic contexts, learning objectives, and participant groups. It is particularly suitable for use in Living Lab environments, classroom settings, interdisciplinary workshops, or community-engaged learning formats.

2. Activity Toolkit

This section offers a complete guide on the structure and realisation of one of the project-tested introductory engagement activities with concepts like biodiversity and NBS. An overview of the methodology of the activity, the audience profile, materials and preparation required, as well as step-by-step directions on implementing the activity is provided in the form of a comprehensive toolkit, openly accessible through the ENABLS project.

2.1 Audience Profile

This activity can be conducted with audiences that characterise, but are not limited to the following:

- ***varying prior awareness and knowledge levels of biodiversity and NBS***
- ***diversity in age***
- ***culturally and socially diverse backgrounds***
- ***diversity in professional or educational disciplines***

While working with heterogenous groups brings rich opportunities for mutual learning and grounded understanding of sustainability challenges, it is important to acknowledge that diversity (in awareness or knowledge levels, age, backgrounds, disciplines) can also present certain challenges in group dynamics. For instance, differing knowledge levels within academic experts and those with lived or practical experiences (in common words, lay people) may unintentionally lead to hierarchies or imbalances in participation. To navigate this, facilitators could actively encourage an inclusive dialogue and space where all contributors are equally heard and valued. Emphasising that 'lay' participants are experts in their own contexts such as everyday practices or community concerns and can help establish shared ownership of the activity. Addressing these differences in knowledge experiences openly at the start of the activity can foster trust and meaningful engagement across varying audience profiles.

The activity aims to spark curiosity, foster dialogue, and create personal entry points into sustainability topics. Through hands-on exploration, guided reflection, and open conversation, participants are invited to see themselves as both learners and contributors to a shared ecological future. The next section offers a complete template and guidance to implement such an activity within your organisation, community or educational setting freely, with minimal preparation.

2.2 Introduction to the activity – NBS101 Bingo

Biodiversity, NBS, and sustainability-related topics are frequently viewed through the lens of environmental science. However, their relevance extends across disciplines including engineering, business, health sciences, the arts, and beyond. The NBS101 Bingo activity is designed to break down these disciplinary boundaries by offering a fast-paced, interactive method for participants to explore how NBS concepts may emerge in their own fields of study, professional practice, or everyday experiences.

Inspired by the classic game of Bingo, this activity transforms the original rules into a learning tool that supports both **peer-to-peer exchange** and **cross-disciplinary reflection**. Instead of matching numbers, participants engage in short conversations with one another to identify whether they, or their field can relate to prompts presented on a Bingo card. When a connection is made, they mark that square, adding brief notes based on the conversation. The goal remains the same: completing lines or patterns on the card. However, the emphasis is on **discussion, insight-sharing, and collaborative meaning-making**.

The activity incorporates multiple layers of engagement, including metaphorical thinking (by connecting disciplines to ecosystems), group-based exploration, and collective reflection. **It invites participants to shift perceptions, uncover unexpected linkages, and recognize the broader relevance of NBS across knowledge systems.** While ideal for use in student, academic, and practitioner settings, the activity is also highly adaptable for general public engagement. For instance, it can be a good activity with local residents and the practitioners before a green community project is planned in the neighbourhood. This activity can also be used as an opening exercise for a series of events focused on a particular theme to gauge **where the interest and experience of the participants lie.** Using the editable bingo template available with the materials- various themes, topics and statements can be explored based on the setting. This supports inclusive learning and shared exploration in both formal and informal learning environments.

Purpose

> ***To interact with Nature-Based Solutions (NBS) and Biodiversity concepts in a light and engaging format while prompting for deeper understanding and reflections on the relevance of NBS for biodiversity in a diverse group setting.***

2.3 NBS101 Activity Overview

Table 1: NBS101 activity overview.

Category	Details
Group Size	12-25 participants
Lead	One facilitator to guide the group through the activity using the toolkit.
Time Needed	45–60 minutes (flexible, based on group pace and energy)
Activity Flow	1. Start-off / Ice-breaker – 5 minutes 2. Bingo challenge – 15 minutes 3. Ecosystem grouping – 5 minutes 4. Small group discussions – 15 minutes 5. Joint reflection – 10–15 minutes 6. Buffer / Wrap-up – 5 minutes
Materials Required	1. Printed NBS101 Bingo cards with ecosystem labels (Forest, Wetland, Coral Reef, Urban Green Space, Grassland). Ecosystem labels can be adapted based on the disciplinary focus and group size. (1 per participant) 2. Activity sheet for small group discussions (1 sheet per group) 3. Pens or markers 4. Projector for display 5. Timer or bell

2.4 Directions

Step 1 (5 minutes)

Before the Bingo: Building a shared starting point

To begin the session, consider incorporating a brief icebreaker, think of it as *'ice-breaking without causing climate change'*. Invite participants to introduce themselves by sharing their disciplinary background and current familiarity with biodiversity and NBS. This step helps to assess the impact of group thinking and reflections post-activity. You might use simple image-based prompts to initiate the discussion, for example, ask whether a given photo represents a NBS or a biodiversity-related challenge. Alternatively, display brief scientific definitions of NBS and biodiversity and ask participants whether these resonate with their field or experience. For examples and clear definitions, visit the ENABLS project website for project articles and comprehensive overview of nature-based solutions.

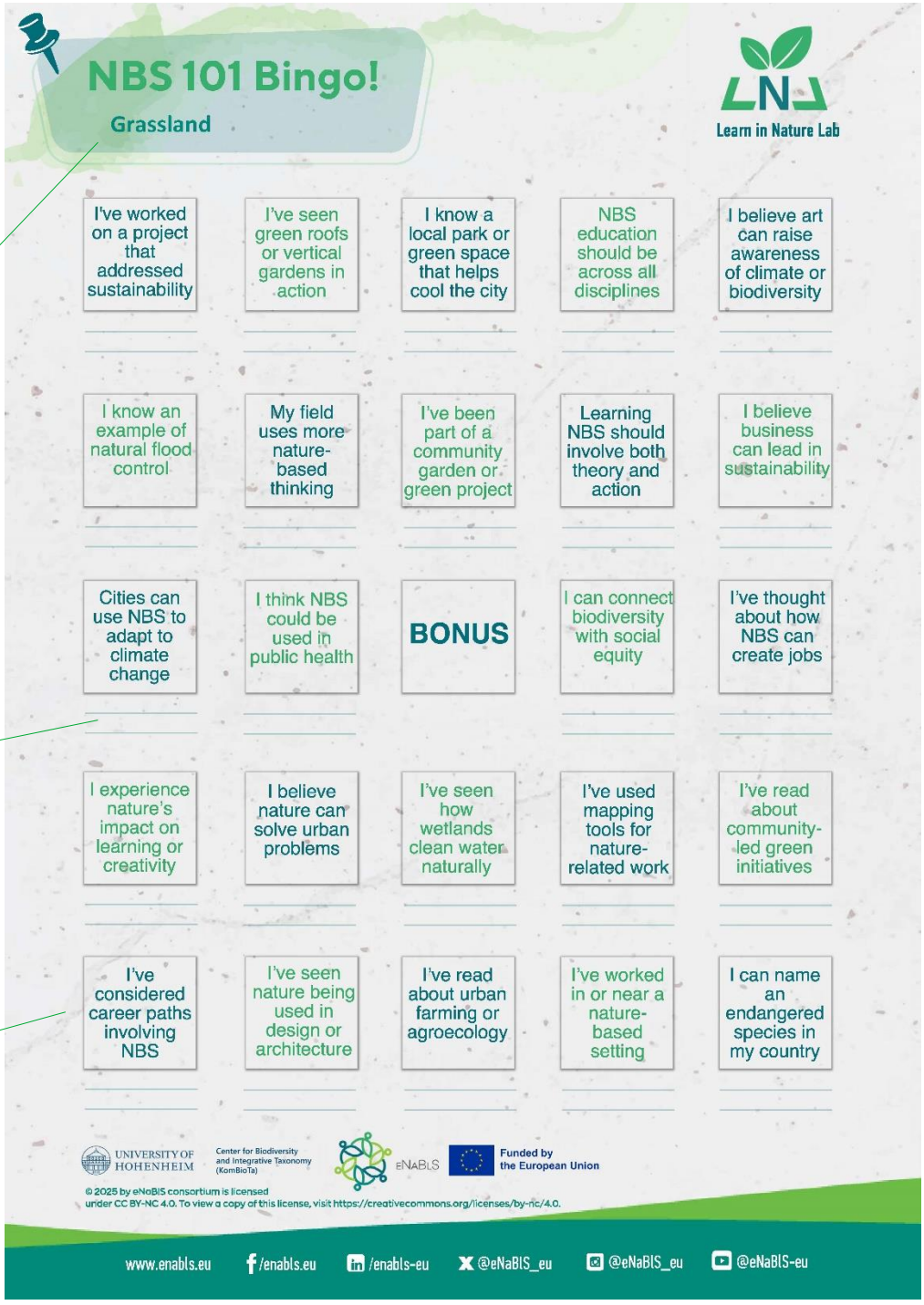
Step 2 (15 minutes)

The NBS101 BINGO challenge

The following table provides detailed instructions on how to conduct the NBS101 Bingo challenge with the group:

Table 2: The Bingo challenge overview.

Step	Instructions
1. **Distribute Materials**	Give each participant: - One NBS101 Bingo card (refer to section 4.1). Distribute cards from all the ecosystems equally based on the group size. For example, if you have 20 participants, there will be 5 cards of each ecosystem, or with 12 participants, you can distribute 3 cards from 4 ecosystems. - A pen or marker
2. **How to Play**	Participants walk around and interact: 1. Ask others if they relate to a Bingo square 2. If the answer is *yes* and they explain *why*, they write a short note under the square and strike it off
Interaction Rule	Participants **cannot speak to the same person twice in succession**. They must talk to at least one other person before returning to the same individual.
3. **Bingo Goals**	Participants aim to complete: - **5 in a row** (any direction) - **All 4 edges** of the card - **Bonus**: Fill the entire card
4. **Celebrating Progress**	Participants should shout "**Bingo**!" or raise a hand when completing each goal.
5. **Optional Awards**	Facilitators may recognize: - First to complete each stage - Most squares filled Note- it is not necessary to carry on the activity until all the 3 goals are met. The activity stops after 15 mins.



Ecosystem Label

Space for Notes

Bingo Squares

Figure 1: The Bingo Card.

Step 3 (5 minutes)

Ecosystem Sorting

Once Bingo goals are reached, participants look at the ecosystem printed or marked on their Bingo card that they were randomly assigned.

Ecosystem options:

- Forest
- Wetland
- Coral Reef
- Urban Green Space
- Grassland

Participants form groups based on their assigned ecosystem. You can add or remove ecosystems based on the number of activity participants during the NBS101 Bingo challenge.

Optional step: If they feel a stronger connection to another ecosystem, they may swap and join that group. Open prompt for this step- **"Imagine your field of study or work as an ecosystem. Which one are you most drawn to, and why?"** Let each person speak briefly.

Aim for even group sizes eventually.

Step 4 (15 minutes)

Group Reflections

Each ecosystem as a group discusses the following questions:

- **Which Bingo square sparked your interest the most, and why?**
- **What is one surprising way you think NBS could apply to your field?**
- **Did someone have a perspective on a square that changed how you see it?**
- **Pick the square that felt hardest to connect to your field. Try to brainstorm ways it could be relevant, even indirectly**.

Each group is allocated an activity sheet to write their reflections on as a group and a space to discuss. (Find the activity sheet along with the bingo cards in the activity material)

Figure 2: Group Activity Sheet.

Step 5 (5 – 10 minutes)

Joint Reflections

Reconvene with the whole group. Invite each group to briefly share insights from their discussions using the filled-out activity sheet.

Optional discussion step (if time permits):

- **Where did your field and someone else's overlap in terms of these sustainability approaches and concepts?**
- **Are there examples where two fields might collaborate to bring an NBS idea to life?**

- **What barriers or misconceptions about NBS and biodiversity exist in your field, and how could you shift that?**

Collect notes from this optional discussion on a whiteboard or allow participants to leave their thoughts on sticky notes under these questions laid out on a board or a large sheet of paper.

End of activity.

2.5 Note

This activity can also be used as a starting point for co-developing discipline-specific NBS case studies or integrating NBS questions into course syllabi and capstone projects. As an example, this activity was used as an introductory session to the Learn in Nature Lab, essentially a living lab established at the University of Hohenheim under the eNaBlS project. This activity was followed by further sessions of the living lab based on nature-based approaches targeting different topics within this spectrum.

Encourage openness. Some disciplines may find it hard to see a connection to NBS at first, and that's exactly where the richest conversations often start. You can also adapt the bingo squares as per your needs and session topics to make it even more impactful. The templates are available along with this material in a single PDF file named as **'eNaBlS_NBS101 Bingo Activity Material'.**

3. Reuse & Acknowledgement

Parts of this activity – such as the development of bingo prompts and formatting were supported by ChatGPT (OpenAI, 2025) to broaden the range of disciplinary connections and enhance inclusivity in communication. The structure and approach of this publication were also inspired by the Ramsar Convention's Toolkit for Education for Sustainable Development (2022), which offers valuable guidance on designing engaging sustainability resources. While AI can be a powerful tool to explore diverse ideas and prompts, its use in educational design should remain critically guided, academically monitored, and applied with conscious attention to context and values. This publication has followed the same approach, and we encourage others to do so as well when adapting this material.

You are welcome to reuse and adapt the materials provided here under the terms of the **Creative Commons Attribution - NonCommercial 4.0 International (CC BY-NC 4.0)** license. This means you may modify the content to suit your own ideas, contexts, and needs for non-commercial purposes – **but please remember to cite us as the source**.

We are also keen to learn from your experiences! If you use or adapt this material in your own setting, we would greatly appreciate hearing about how it worked for you. Email your insights at enabls.uni-hohenheim.de. Your feedback helps us continue improving and expanding accessible tools for mainstreaming nature-based solutions for biodiversity in higher education and beyond.

4. Materials Provided

The following materials are available along with this publication to make NBS101 Bingo ready to use!

4.1 NBS101 Bingo - How to Play Infographic

A compilation of the activity for workshop facilitators.

4.2 NBS101 Bingo Card Template

Editable PDF. Use this if you would like to add your own texts in the bingo squares, or use new ecosystems. Print in A4 format.

4.3 NBS101 Bingo Cards x 5

A full set of 5 cards, ready to use after printing. Print in A4 colour format.

4.4 The Group Activity Sheet

Print in A3 colour format.

1 References

Cardinale, B. J., Duffy, J. E., Gonzalez, A., Hooper, D. U., Perrings, C., Venail, P., ... & Naeem, S. (2012). Biodiversity loss and its impact on humanity. Nature, 486(7401), 59–67. https://doi.org/10.1038/nature11148

Cohen-Shacham, E., Walters, G., Janzen, C., & Maginnis, S. (Eds.). (2016). *Nature-Based Solutions to address global societal challenges*. IUCN International Union for Conservation of Nature. https://doi.org/10.2305/IUCN.CH.2016.13.en

Díaz, S., Settele, J., Brondízio, E. S., Ngo, H. T., Agard, J., Arneth, A., ... & Zayas, C. N. (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services*. IPBES.

Evans, J., Jones, R., Karvonen, A., Millard, L., & Wendler, J. (2015). *Living labs and co-production: University campuses as platforms for sustainability science*. Current Opinion in Environmental Sustainability, 16, 1–6. https://doi.org/10.1016/j.cosust.2015.06.005

IUCN. (2020). *Nature-based solutions: About*. International Union for Conservation of Nature. Retrieved from https://www.iucn.org/theme/nature-based-solutions/about

OpenAI. (2025). *ChatGPT* (May 2025 version) [Large language model]. https://chat.openai.com/
Pyle, R. M. (2003). *Nature matrix: Reconnecting people with nature*. Oryx, 37(2), 206–214. https://doi.org/10.1017/S0030605303000383

Ramsar Convention on Wetlands. (2022). *Toolkit for Education for Sustainable Development: Version 2*. Ramsar Regional Center – East Asia. https://www.ramsar.org/sites/default/files/documents/library/esd_toolkit_version_2.pdf

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E., ... & Foley, J. (2009). *Planetary boundaries: Exploring the safe operating space for humanity*. Ecology and Society, 14(2). https://doi.org/10.5751/ES-03180-140232

Soga, M., & Gaston, K. J. (2016). *Extinction of experience: The loss of human–nature interactions*. Frontiers in Ecology and the Environment, 14(2), 94–101. https://doi.org/10.1002/fee.1225

eNaBLS

www.enabls.eu

Project information

Title	eNaBLS - **e**ducation and **Na**ture-**B**ased Sol**u**tions: enable **S**ociety to bend the curve for biodiversity (GA No 101135035)
Start - end date	1/1/2024 – 31/12/2026 (36 months)
Project type	Coordination and Support Action
Programme	Horizon Europe – Cluster 6
Funding	2,951,847.33€
Coordinator	University of Hohenheim (UHOH) Dr. Ann-Catrin Fender (anncatrin.fender@uni-hohenheim.de)

Project overview

eNaBLS will set the basis of networking and collaboration to promote, embed and unfold Nature-based Solutions (NBS) concepts and approaches within universities and vocational schools, the professional sphere and society at large through transdisciplinary dialogue. eNaBLS envisions the creation of 7 Living Labs (DE, NL, FI, AT, LT, EL, CZ), incorporating all 'voices' and leaving no one behind. The goal is to enable society to bend the curve for biodiversity by mainstreaming both NBS and biodiversity in higher education and Technical and Vocational Education & Training (TVET). The ultimate objective is for eNaBLS to contribute more generally to i) the advancement of a Nature Positive society through the necessary transformative change of communities, business models and lifestyles, and, specifically, ii) put biodiversity and climate on the path to recovery responding to the objectives of the EU biodiversity strategy for 2030 and the EU climate adaptation strategy.

Consortium

UNIVERSITÄT HOHENHEIM
WAGENINGEN UNIVERSITY & RESEARCH
UNIVERSITY OF EASTERN FINLAND
BOKU UNIVERSITY
VYTAUTAS MAGNUS UNIVERSITY
ICA Association for European Life Science Universities
3s
IDEA training
CERTH CENTRE FOR RESEARCH & TECHNOLOGY HELLAS
FOCUS strategic training consultants
BIO EAST HUB

info@enabls.eu

/enabls.eu /enabls-eu @eNaBlS_eu @eNaBlS_eu @eNaBlS-eu @enabls-eu.bsky.social

eNaBLS

Education and NBS -
bending the curve for biodiversity

www.enabls.eu