

## Project Report

*Author-formatted document posted on 27/04/2026*

*Published in a RIO article collection by decision of the collection editors.*

DOI: <https://doi.org/10.3897/arphapreprints.e197166>

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# Policy support tools for TEN-N implementation

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# NATURA CONNECT

## TEN-N spatial planning tools

D8.1 Policy support tools for TEN-N implementation



Funded by  
the European Union

NaturaConnect receives funding under the European Union's Horizon Europe research and innovation programme under grant agreement number 101060429.

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**Prepared under contract from the European Commission.**

Project acronym:	NaturaConnect
Project full title:	NaturaConnect - Designing a resilient and coherent Trans-European Network for Nature and People
Grant agreement number:	101060429
Start of the project:	1 July 2022
Duration:	51 months
Project coordinators:	International Institute for Applied Systems Analysis (IIASA) and Martin-Luther Universität Halle-Wittenberg (MLU)
	<a href="https://naturaconnect.eu">naturaconnect.eu</a>
Scientific coordinator:	Piero Visconti, PhD, IIASA
Type:	HORIZON Innovation Actions
Call:	HORIZON-CL6-2021-BIODIV-01

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D8.1 Policy support tools for TEN-N implementation

31.03.2026

<b>Project reference number</b>	<b>101060429</b>
<b>Project title</b>	NATURACONNECT - DESIGNING A RESILIENT AND COHERENT TRANS-EUROPEAN NETWORK FOR NATURE AND PEOPLE

<b>Deliverable title</b>	Policy support tools for TEN-N implementation
<b>Deliverable number</b>	D8.1
<b>Contractual date of delivery</b>	31 March 2026
<b>Actual date of delivery</b>	31 March 2026
<b>Type of deliverable</b>	DEM — Demonstrator, pilot, prototype
<b>Dissemination level</b>	PU – Public
<b>Work package number</b>	WP8
<b>Institution leading work package</b>	1 – IIASA
<b>Task number</b>	Task 8.7
<b>Institution leading task</b>	1 – IIASA
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<b>Deliverable reviewers</b>	Marit Schnepf, Andrew Plumptre, Hildegard Meyer.
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<b>Deliverable description</b>	This is the output of task 8.7 and includes: - developing and make openly available an easy-to-use online interface to implement spatial planning for case study implementation - developing, making freely available and providing training for an open-source GIS toolbox “NaturaConnector” available for standard GIS programs (QGIS/ArcGIS) that will allow spatial planners to apply and adapt our analysis workflows based on customized problem variants and
<b>Keywords</b>	Spatial platform, Prototype, Prioritisation, Dashboard, GIS

We would like to express our sincere gratitude to the stakeholders who contributed their time, expertise and feedback on the policy support tools outlined in this report, and the data layers underpinning the tools. Your contributions have helped to develop decision-making support products for planning the Trans-European Nature Network with improved data accuracy and platform usability.

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# Abbreviations

<b>AOI</b>	Area of interest
<b>BISE</b>	Biodiversity Information System for Europe
<b>CBD</b>	Convention on Biological Diversity
<b>DMP</b>	Data Management Plan
<b>EEA</b>	European Environment Agency
<b>GIS</b>	Geographic Information System
<b>IIASA</b>	International Institute for Applied Systems Analysis
<b>KBA</b>	Key Biodiversity Areas
<b>NADEG</b>	Expert Group on The Birds And Habitats Directives
<b>NCP</b>	Nature's contributions to people
<b>OGC</b>	Open Geospatial Consortium
<b>SCP</b>	Systematic conservation planning
<b>SSP</b>	Shared Socioeconomic Pathway
<b>TEN-N</b>	Trans-European Nature Network
<b>UI</b>	User Interface
<b>WP</b>	Work Package
<b>WMS</b>	Web Map Service

## Executive summary

Ambitious commitments under the European Biodiversity Strategy for 2030, including protecting at least 30% of land area and restoring 20% of ecosystems, are an opportunity to halt and reverse biodiversity loss. Achieving these objectives would benefit from coordinated, integrated and biodiversity-inclusive spatial planning approaches to identify where conservation and restoration actions will be most effective and resilient. Systematic conservation planning (SCP) provides such a framework, but its outputs are often complex and need to be translated into actionable and interpretable information for decision makers.

Here in the context of the NaturaConnect project, we developed stand-alone policy support tools designed to bridge this gap between science, policy and practice, specifically tailored to the implementation of the EU Biodiversity Strategy in the terrestrial realm. Specifically, we developed two interactive platforms, described in this deliverable: NaturaConnector and PriorityCheck. Both tools are web-based and enable to visualise spatially explicit prioritisation outputs generated using the prioritizr R-package. We produced multiple spatial scenarios reflecting different objectives and planning assumptions, allowing exploration of trade-offs and synergies across different scenarios.

NaturaConnector provides a web-based interface that enables users to explore our prioritisation outputs interactively and to better understand the implications of alternative planning strategies. It allows users to compare different scenarios, adjust planning criteria, and visualise how priorities shift under different objectives, assumptions, and implications in terms of performance across a range of ecological, geographic and socio-economic indicators. To facilitate uptake and dissemination, the platform also includes a link to downloadable infosheets for 39 countries and 10 biogeographic regions. The infosheets showcase consensus prioritization outputs as well as an assessment of the performance of the spatial planning solutions with some key takeaways specific to each country or geographic region.

PriorityCheck is an online tool that enables users (stakeholders, practitioners, and experts) to engage directly with the prioritisation outputs, including querying the species and habitats composition at each site, and provide spatially explicit feedback to the research team on selected priority areas, regarding their implementation challenges, feasibility, and local relevance and value for conservation or restoration. Based on this spatially-explicit feedback entered by stakeholders and regional experts on PriorityCheck, we then further refined and improved the spatial prioritisation outputs.

# 1. Introduction

NaturaConnect is a Horizon Europe project dedicated to designing and developing a blueprint for a truly coherent Trans-European Nature Network (TEN-N) of conserved areas that protect at least 30% of land in the European Union, with at least one third of it under strict protection. Another ambition of the project is to bridge the gap between scientific products produced and actionable policy implementation towards designing and implementing the TEN-N. In this deliverable, we describe policy support tools developed as part of the NaturaConnect project that facilitate easy access by decision makers and support them in identifying priority areas for nature conservation and restoration within their jurisdiction. The value of these tools lies in helping to translate complex scientific outputs into accessible formats to maximise potential uptake in regional, national and local planning processes.

A key distinction within the NaturaConnect tools described here is between online and offline decision support tools. Online tools are typically web-based, interactive platforms that allow users to access and visualise data in real time, often requiring an internet connection. Offline tools, by contrast, are designed to function independently of an internet connection; they typically take the form of downloadable documents, or printed guidance. Together, the project's adoption of both modalities ensures that NaturaConnect's outputs remain accessible across diverse settings and resource environments and serve all decision support needs.

Beyond their direct role in informing policy decisions, the tools compiled and developed within NaturaConnect serve a critical function in providing stakeholders with a direct way to not only interact with results but also provide feedback to the project. Direct exchanges with stakeholders across all of Europe remains logistically and financially challenging, and the tools developed here have enabled stakeholders to provide spatial-explicit feedback on outputs of NaturaConnect, ultimately improving accuracy, relevance and potential uptake of the results.

The aim of this deliverable is to provide a comprehensive overview of some of the area-based conservation policy support tools created and curated by NaturaConnect. Specifically, it covers three main categories of tools:

- The NaturaConnector platform, an interactive tool designed to enable online visualisation of different prioritisation scenarios (known as 'variants') as well as their benefits evaluated through a set of indicators;
- The GIS-Tool (PriorityCheck) for interacting with prioritisation outputs and providing spatially explicit feedback to the research team on the prioritised areas; and
- A set of policy support infosheets, which offer decision makers a clear evaluation of the performance of the selected TEN-N scenario compared to the existing protected area network.

While NaturaConnector and the infosheets are designed to visualise the outputs of the prioritisation analyses and will remain available long beyond the project lifespan, PriorityCheck was developed specifically as a tool to elicit spatially-explicit feedback and expertise from stakeholders on the priority areas in order to improve the prioritisation analyses during the project's lifetime.

The deliverable describes each tool according to their rationale for development, development methodology, and intended use by stakeholders, offering a structured reference for both consortium members and external stakeholders seeking to navigate and use the available tools.

## 1.1. Mini-review of available decision-support tools

A range of tools are available to support decisions for spatial conservation and restoration planning. This includes spatial conservation prioritisation tools, and the most commonly used are Marxan (Ball et al. 2009), Zonation (Moilanen et al. 2022), prioritizr (Hanson et al. 2025). These tools enable to identify areas of high importance for conservation or restoration, that efficiently meet biodiversity objectives under constraints (e.g. limited funding resources or area) (Margules & Pressey 2000). Both Marxan and Zonation provide an accessible and user-friendly interface, facilitating the application of spatial prioritisation across contexts. Marxan has been widely applied in Europe and globally (Ball et al. 2009). Zonation, also widely used and applied, produces a continuous ranking of a region of interest based on conservation value (Moilanen et al. 2005; Lehtomäki & Moilanen 2013; Moilanen et al., 2022), and has been effectively applied in both academic and applied contexts to identify top priority areas for conservation and restoration, including by national authorities such as in Latvia or Finland. Developed more recently, the R package prioritizr provides a more flexible and transparent framework for defining and solving spatial prioritisation problems and is increasingly used in both research and applied contexts (Hanson et al. 2025). Its only barrier is that its use requires knowledge of R programming.

Beyond these tools, a number of additional plugins and toolboxes have been developed for users to support data preparation, analysis and visualisation, particularly within more commonly used GIS environments such as QGIS, allowing users to set up and run prioritisation analyses. For example, a number of interfaces have been developed to make Marxan more accessible to non-specialist users, including CLUZ (Conservation Land-Use Zoning) for QGIS, the QMarxan Toolbox, and web-based platforms such as WhereToWork or cloud-based Marxan solutions. (see: <https://github.com/tsw-afropos/qmarxantoolbox> and <https://github.com/NCC-CNC/wheretowork> or <https://marxanplanning.org/>). These tools can lower entry barriers to otherwise complex methodological approaches and are already widely available to stakeholders and practitioners. Based on the assessment, it becomes clear that the main gaps are not in the availability of tools for identifying priority areas for conservation, but in their uptake and use, as these tools often require a certain level of technical expertise, particularly in handling spatial data and interpreting model outputs. Jung et al. (2024) identified several barriers to applying spatial conservation prioritisation in Europe: limited access to harmonised open data, a lack of user-friendly decision-support tools, and insufficient integration of stakeholder engagement and co-design processes. In addition, there is relatively little investment in training and capacity building, which limits the ability of practitioners and decision makers to make full use of existing tools. Additionally, to our knowledge there are no tools that allow to integrated expert-based knowledge into algorithmic approaches to spatial planning for conservation.

In NaturaConnect, to address these gaps, we developed decision-support tools aiming to make prioritisation outputs accessible in order to effectively support policy and implementation on the ground. We also created an online tool that allows experts to query maps and provide spatially-explicit feedback, and a workflow to systematically consider and integrate expert feedback into priorities established through multi-criteria optimization methods. We have also created a training course, the NaturaConnect Learning Platform hosted by the European Nature Academy (<https://tinyurl.com/ENA-NC>, see Schnepf et al., 2024 for a detailed description) aiming to make existing spatial prioritisation tools more accessible and encourage their use and application across contexts.

## 2. NaturaConnector platform

### 2.1. Rationale for development

Within the project, we use prioritizr (Hanson et al., 2025) to identify priority areas for conservation, strict protection and restoration. Rather than producing a single optimal solution, we generate multiple prioritisation variants, aiming to guide and support conservation and restoration planning objectives across a range of needs, values and constraints (but see Jung et al. 2024). In total, we developed 144 scenarios, varying according to different planning criteria, such as whether focusing only on species and habitats or also including ecosystem services, whether climate change and connectivity are explicitly considered, and how area allocated to conservation and restoration should be distributed between European countries and biogeographic regions (ref D7.1: Jung et al., 2024). This recognises that there is not just one possible spatial configuration for a Trans-European Nature Network (TEN-N), but rather a range of possible solutions depending on objectives and constraints.

The complexity and multi-dimensionality of prioritisation outputs from the task associated with this deliverable (T7.3) creates challenges in making them accessible and usable for a broader audience. To address this, we developed a web-based platform coined 'NaturaConnector', which provides an interactive interface for exploring the integrated prioritisation outputs from Work Package (WP) 7, thereby making the complex portfolio of prioritisation outputs accessible to a range of audiences. The platform enables users to navigate and interact with different prioritisation scenarios by selecting criteria and parameters, allowing them to visualise and compare variants both spatially and in terms of performance across a range of indicators, thus helping to better understand the implications of different scenarios, and the trade-offs between objectives and preferences. The tool is designed for a range of end users, including decision makers and authorities responsible for conservation and spatial planning, as well as NGOs, scientists, and other stakeholders involved in conservation and restoration policy, planning and implementation.

The NaturaConnector platform, described in this Deliverable, builds on the User Interface (UI) of previous interactive online platforms developed by the IIASA Scenario Services team, and that are designed to support scenario analysis, visualisation, and dissemination of complex model outputs. Work by the team focuses on making large-scale modelling results accessible to researchers, policymakers, and other stakeholders through interactive platforms, bridging the gap between scientific research outputs and decision making. They develop and maintain web-based systems that allow users to access, visualise, and download scenario data. For example, the Global Hotspots Explorer (<https://hotspots-explorer.org/>) provides an interface to explore SSP scenarios across regions. By building on previous interactive interfaces and their implementation, the NaturaConnector platform can benefit from joint maintenance efforts also beyond the lifetime of this project.

### 2.2. Technical implementation

The **NaturaConnector** site consists of three main sections from a technical implementation perspective:

- The **Map**, which allows users to select and view the **raster data layers** and shows a **base map, region labels** and **clickable region shapes** for countries and biogeographical regions
- A **detailed region view**, which expands when a region is selected and shows more data aggregated for that region

- **Supplementary material** such as links to external resources, glossary, quick-start guide, methodology report and more

Historically, the IIASA Scenario Services Team focused on user interfaces and tools for [IAMC-style timeseries data](#), with geospatial visualisation options limited to choropleth maps showing the applicable set of regions. While the use of raster-oriented geospatial information was enabled for specific projects and facilitated by developing customised prototypes, the IIASA infrastructure did not yet provide a standardised way or any guardrails for uploading, indexing and serving this kind of data. Hence, the effort was made to introduce a more robust and user-friendly system to bridge the gap between geospatial research output and the technical implementation of user interfaces and apps disseminating it. Said system was integrated into shared codebases and can be reused and improved perpetually.

### 2.2.1 Shared Component Library

Building on the existing work by the IIASA Scenario Services Team, extensions were made to the **shared UI component library “scse-components” and surrounding infrastructure** to facilitate the use of added functionality across different projects, while in turn benefiting from the design and development work from other concluded or ongoing activities. The library is based on the [Vue 3](#) / [Nuxt](#) frameworks and uses another component library “[Vuetify](#)” for generic components like selection controls, structural concepts, and text fields.

Since the launch of the NaturaConnect project, the following contributions to this shared codebase can be attributed to it:

- A **full-page map explorer component** (based on [Leaflet](#), using [Stamen Map Tiles](#)) with plenty of utility components including **legend**, **zoom controls**, **model-run parameter selection** and **detail view** (used in this project to show more information about specific countries and bioregions)
- An improved **header component** with support for subtitles
- **deployment management system** for all frontend web applications maintained by the IIASA Scenario Services Team

This extended functionality was used to assemble the NaturaConnector site, which can be statically built and served using the IIASA Scenario Services web server infrastructure.

### 2.2.2 Spatial Data

The spatial data handling workflow was improved by introducing the new tool “**scse-spatial**” to the Scenario Services suite. This tool implements a **standardised structured file format** for layer and feature information, **validation facilities**, **deduplication** and **constraint validation** via a database (currently [SQLite](#)) and can **automatically simplify and generate appropriate qualities for vector data** like region borders to deal with data transfer limitations and enable lazy loading of higher quality data from the browser.

For each set of raster layers and region information produced by research efforts and uploaded to a [GeoServer](#) instance, **scse-spatial** was used to:

- Normalize, validate and save metadata and parameters for layers and regions
- Check the appropriate layers exist on the GeoServer
- Output a set of minified browser-ready files needed by the web application

The output files from this process are included in the web application and used to select the right layer from the states of the UI elements, obtain information about how to request the data from the appropriate server and associate additional data with features and raster layers.

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### 2.2.3 Data Flow Diagram

For a visual overview of the process, refer to Figure 1 below detailing the flow of research data:

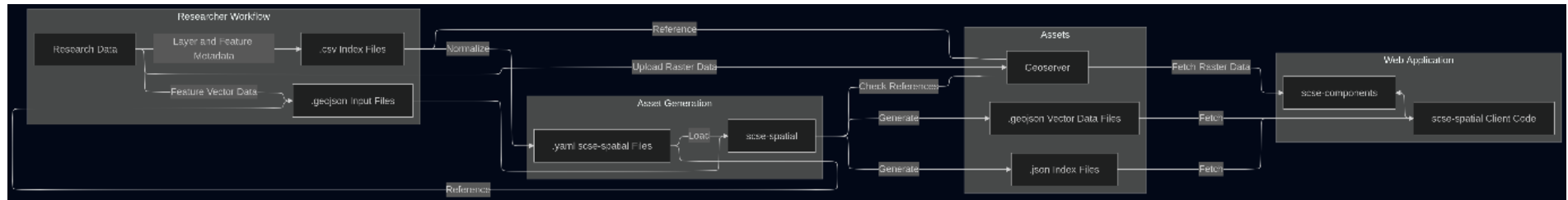


Figure 1: Flow of research data for NaturaConnector

## 2.2.4 Stakeholder feedback elicitation and updates to platform

To develop the NaturaConnect platform in a manner which optimised usage among its target audiences, the project team engaged stakeholders throughout 2024, 2025 and 2026 to gather feedback on the usability and accuracy of its data layers. Stakeholders were engaged at the following events:

- The **Natura 2000 Biogeographical Seminar for the Mediterranean region, from 17 - 19 April 2024** in Larnaca, Cyprus: The early prototype for the NaturaConnect Platform and protected area expansion priorities, were presented to Member State representatives of the Expert Group on The Birds And Habitats Directives (NADEG). The project team sought initial feedback on accuracy of identified areas, and perspectives on usability and application of the NaturaConnect platform. Stakeholders at the meeting included representatives from environmental departments of national and regional agencies, project managers of applied conservation activities within the Natura2000 sites of the region, scientists and the European Commission.



Figure 2: NaturaConnect stakeholder engagement for the NaturaConnect platform and prioritisation areas data at the Natura 2000 Biogeographical Seminar for the Mediterranean Region, 17–19 April 2024, Larnaca, Cyprus. © NaturaConnect

In our presentation we highlighted that many priority areas for protected area expansion are located in the Mediterranean region. These could provide some of the best additional biodiversity outcomes when included in the expansion of the protected area network to 30% across Europe. The main recommendation from stakeholders was to distinguish existing protected area boundaries from those of the priority areas for protected area expansion in the platform, which was subsequently integrated into the platform by the project team. Another recommendation was to provide indicators based on ecosystem type; this was not implemented due the complexity of integrating many additional indicators (the platform already includes 10+ indicators, in addition to those for species and habitats) and the intention to ensure visual simplicity in the platform. The general feedback on the NaturaConnect platform was positive, with stakeholders noting the usefulness of the platform for helping them consider areas for expanded protection in light of broader EU biodiversity goals.

- The **“Models and approaches for conserving biodiversity today and tomorrow” workshop**, from 5 - 6 November 2025 at the National Museum of Natural History in Paris, France, co-organised by PatriNat and the Laboratoire d'Ecologie Alpine (LECA, CNRS) as part of the NaturaConnect French case study. The event brought together French national and regional authorities and experts, including representatives from PatriNat, the Office Français de la Biodiversité, and departmental and regional authorities. The project team presented research results on species distribution, ecological connectivity, and prioritisation of protected areas at European and national levels for a range of biodiversity features under climate change, with a follow up discussion among workshop participants. The NaturaConnector platform was also presented and feedback sought on its usability and application. The main feedback from stakeholders was to make the protected area expansion priority variants available at the biogeographic region level; this functionality was subsequently integrated into the platform.



Figure 3: NaturaConnect stakeholder engagement for the NaturaConnector platform and prioritisation areas data at the “Models and approaches for conserving biodiversity today and tomorrow” workshop, from 5 - 6 November 2025 at the National Museum of Natural History in Paris, France. © NaturaConnect

- The **From Science to Action: Strategic Planning for the Trans-European Nature Network (TEN-N)** project stakeholder event, from 20-21 January 2026 in Brussels, Belgium. Participants from national and subnational government administrations, protected area authorities, the European Commission, International Conventions (Carpathian Convention, Convention on Migratory Species), non-governmental organisations, consultancies, research organisations, and representatives from the agriculture, forestry, hunting and spatial planning sectors attended the event (see post-event [report](#) for more details). While the NaturaConnector platform itself was not presented, the project team held several interactive exercises to receive feedback from the participants on the accuracy and usability of protected area expansion priorities data, which underpins the NaturaConnector platform. Participants provided extensive feedback on the maps, which is summarised in the post-event [report](#). Stakeholders confirmed that the provision of data in dedicated online viewers (such as NaturaConnector), and in GIS formats (made available by the project account in Zenodo) is needed to facilitate further uptake of NaturaConnect results (O'Connor et al., 2026). Stakeholders also noted that some terminology (such as “burden sharing” in the context of the 30% protected area coverage target) needed to be reframed more positively (subsequently, “burden sharing” has been changed to “responsibility

sharing" in the NaturaConnector platform). The project team is currently assessing how further feedback can best be integrated into the platform.



Figure 4: Stakeholder engagement for NaturaConnect prioritisation areas data at the From Science to Action: Strategic Planning for the Trans-European Nature Network (TEN-N) project stakeholder event, from 20-21 January 2026 in Brussels, Belgium. © NaturaConnect/ Sandra Grego

In addition to the above events, two project webinars were organised to gather feedback from biodiversity experts on prioritisation areas for conservation and restoration using an online feedback tool called 'PriorityCheck', developed by the project team (see Section 3). Feedback from stakeholders during this process has resulted in improvements to the prioritisation areas data in the NaturaConnector platform. Information about the engagement process for these two events is outlined in Section 3.4 of this report.

Finally, the platform has also received internal feedback from consortium members, with suggestions for integrations of protected area, connectivity and freshwater connectivity data layers to aid usability. Some layers have already been integrated into the platform; the remainder are in the process of being integrated in collaboration with relevant consortium teams managing the layers.

### 2.3. Public release of close to completion prototype

The NaturaConnector platform (<https://naturaconnector.iiasa.ac.at/>) main view when opening the application is a basemap (used as background) in black and white hue. The general interface is separated between UI elements (top, left and right of the screen) and the main map (Figure 5). A toolbar at the top of the page provides users with further information about the shown layers ('About') as well a link to a resource page where information on how to download or use the layers is provided.

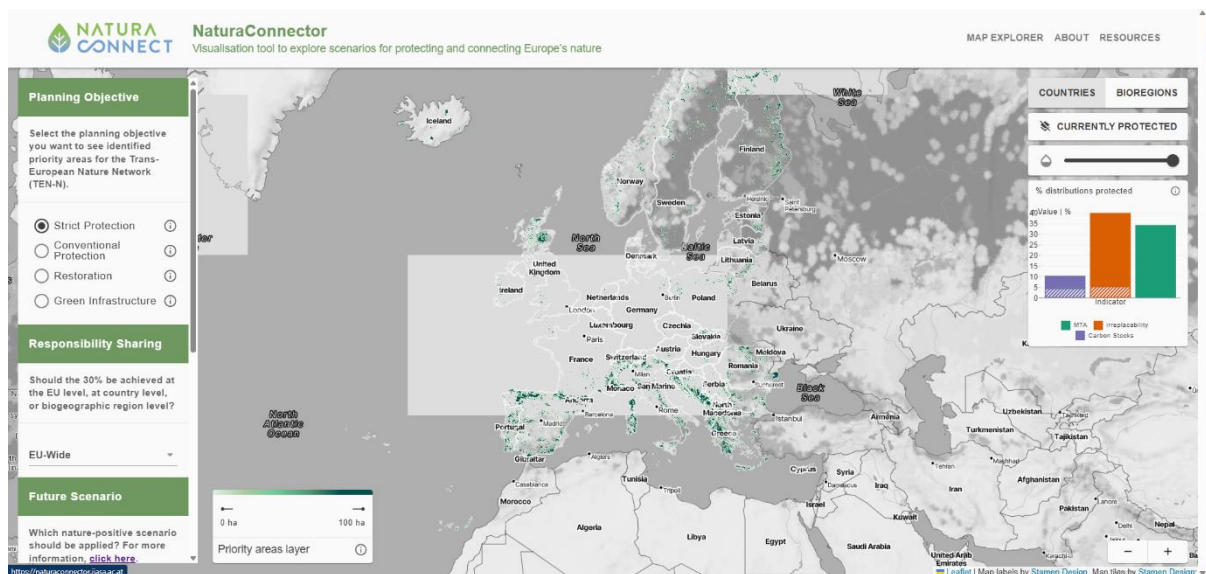


Figure 5: Screenshot of the user interface of the NaturaConnector platform showing the main map and interface elements.

On the top right-hand side, the broader view can be changed from countries to bioregions, viewing existing protected areas (can be toggled on and off) and changing the transparency of shown layer. Further layer settings can be toggled on and off like country/city labels and terrain view. Countries or biogeographical regions can be selected by clicking on them, upon which country specific information will pop up.

The different planning objectives are the foundation layers: **Strict Protection, Conventional Protection, Restoration, and Green Infrastructure**. Selecting these will display the priority areas of each objective. Once a planning objective is selected, the platform automatically adjusts the associated data layers displayed. Based on the additional options you choose such as **responsibility sharing, future scenarios, and other inclusions**, the selected areas can be refined. This allows you to explore how different choices and assumptions affect the resulting map in real time.

By selecting a specific country or biogeographical region a window will pop up. It summarises land area, current protected-area coverage, biodiversity representation, threatened species and habitats, and the importance of the country for endemic or near-endemic biodiversity. Additionally, a range of ecological and socio-economic indicators are shown to quantify the performance/benefits of the priority areas selected in the displayed scenario. This helps place the spatial prioritisation results in context with regards to what a potential implementation would contribute relative to the current protected area network.

In addition, smaller barplots on the main page show a selected indicator, the ecological representativeness of the displayed scenario, measured by the average total amount of species, habitats and key areas for nature's contributions to people (NCP) distributions that are covered by the priority areas.

## 2.4. Next steps and long-term strategy

The NaturaConnector platform is intended to serve as a key support tool for decision-makers, enabling the visualisation of different scenarios generated under the project for the conservation, protection and restoration of nature in the context of TEN-N. Where relevant and possible, further refinements to the platform data and its usability during the remainder of the project will be made by the project team before project end. The platform will also include

references and links to all final technical data outputs by the end of the project in the 'Resources' tab. The platform is fully hosted by IIASA and will thus be operated at little to no cost beyond the lifetime of the project. The long-term strategy for the platform will be outlined in the project's final data management plan (DMP3), which will be made publicly available.

## 2.5. Availability

The NaturaConnector platform is publicly accessible at: <https://naturaconnector.iiasa.ac.at/>. Priority maps for conservation, strict protection and restoration shown on NaturaConnector are available on Zenodo (<https://doi.org/10.5281/zenodo.18863403>, O'Connor et al., 2026).

# 3. GIS-tool for interacting with spatial prioritisation outputs: PriorityCheck

## 3.1. Rationale for development

Systematic conservation planning (SCP) offers a framework for identifying and integrating data, targets, constraints into spatial-explicit priorities where such areas could be implemented. In this framework, specific technical tools, based on heuristics or exact algorithms such as Zonation (Lehtomäki & Moilanen 2013; Moilanen et al. 2022) or prioritizr (Hanson et al. 2025), can be used to map spatial-explicit priorities. Yet, data inputs and spatial prioritisation methods get increasingly more complex, making it harder to visually assess why one 'priority' area is chosen over another.

The participatory involvement of stakeholders in SCP is essential (Margules & Pressey 2000) and can foster a sense of ownership and responsibility but also harness the collective wisdom of different experts in the validation of area-based priorities and identifying key constraints (e.g. agriculture, energy production). One of many key entry points for engaging stakeholders is the visual assessment of spatial priority maps, for example where a 10% strict protected area expansion could happen. At local and landscape-level, the best strategy can be participatory GIS approaches with maps presented in-person. However, with increasing spatial scale (regional to continental) gathering spatial-explicit feedback in such a way can be challenging because of logistical, financial and time constraints. It is thus no surprise that the majority of previous SCP applications did not involve any stakeholders, likely being primarily driven by scientific curiosity (Jung et al. 2024). While lack of engagement can be transparently flagged through standardised reporting (Jung et al. 2025), there does not exist any open, geographically explicit tool that would facilitate the collation of inputs from stakeholders at larger scale.

During the lifetime of the NaturaConnect project, it became clear that innovative ways to interact with stakeholders in hybrid settings were needed. Detailed feedback on spatial-explicit priority maps requires stakeholders to be able to interrogate both maps and features within them. Here we present a novel GIS tool in the form of an interactive online platform ('PriorityCheck') that is specifically built to elicit spatial-explicit feedback on area-based prioritisations. It furthermore contains functionalities to identify key features (species or habitats) that would primarily benefit from the priority area. We will highlight experiences and lessons learned from several stakeholder engagements where we aimed to gather feedback on pan-European conservation and restoration prioritisations outputs.

### 3.2. Methodology

The *PriorityCheck* tool has been developed primarily as an interactive tool to be opened in a browser. The backend it primarily relies on the R programming software run on a local server, and there particular Shiny (Chang et al. 2025) and leaflet (Cheng et al. 2015) for rendering spatial data. Rather than a single shiny app, the tool has been implemented as a modular system using the ‘golem’ framework for production-ready environments (Fay et al. 2021). The modular system allows to separate visualisation components with components related to feedback gathering or query functionalities (Figure 6). From the start, the platform has been designed to visualise specifically spatial prioritisation outputs (such as those obtained from Zonation or prioritizr). Since the aim of PriorityCheck is to enable external stakeholders to interact with (spatial) data, the tool requires a web-exposed server with installed R-shiny server (see also Section 3.3), although it can also be run locally on any PC exposed to the internet.

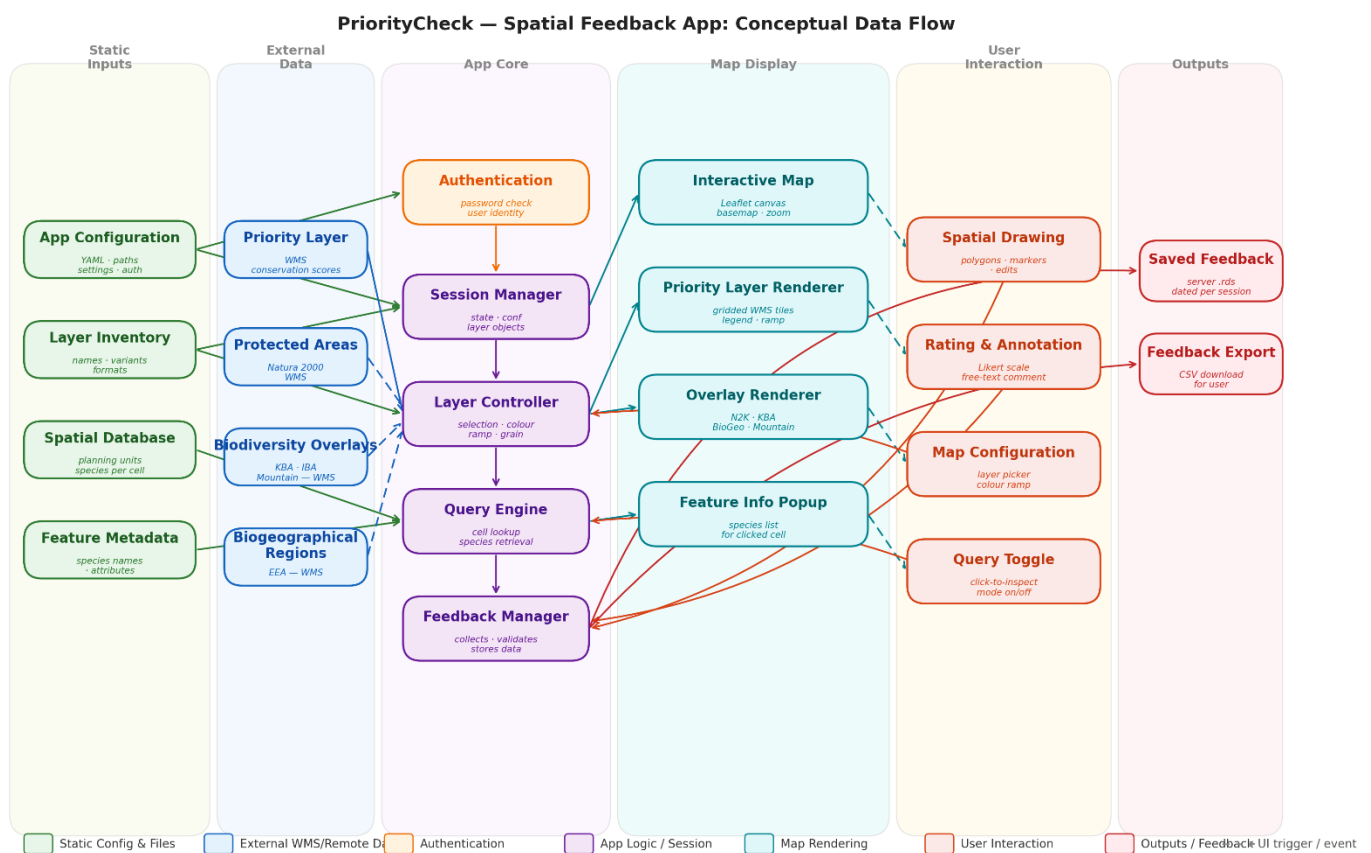


Figure 6: Conceptual flowchart of the PriorityCheck app, highlighting key modules, feedbacks among them as well as inputs and outputs.

With version 1.4, the following functionalities have been implemented:

- Configuration-based modules that can be controlled through a central yaml file, which specifies paths and settings (e.g. Project names, links, url, etc).
- Rendering of spatial-explicit gridded formats in an efficient way. Gridded layers can be supplied either as locally rendered Cloud-optimized Tif file or through a targeted backend such as a Geoserver instance.
- Feedback module that allows to provide spatial-explicit feedback by drawing either points, rectangles or polygons directly on the map. Feedback can be entered on a likert-scale (“agree” to “not agree”, see Figure 8). Entered feedback can be shown

directly on screen, saved internally (on the server instance running PriorityCheck) or exported as a comma-separated file.

- Authentication and campaign module settings, allowing users to add specific login names (and optional passwords) as well as providing functionality to close running campaigns gracefully through an overlay.
- An optionally enabled query functionality, which after clicking on a map that displays to users the features (e.g. which species or habitats are contained in an area). Convenience summary tables are displayed as well as web-links for each species and habitat (see Figure 9). A full list of species and habitats can furthermore be downloaded through the interface as a comma-separated file.
- Optional enabling of rendering additional layers using Open Geospatial Consortium (OGC) compliant Web Map Service (WMS). Tested are for example biogeographic regions, existing Natura 2000 sites from the EEA or globally scoped Key Biodiversity Areas (KBA) from WP7.

A full list of all R-package dependencies as output from 'grateful' can be found in Annex 8.1.

### 3.3. Implementation of PriorityCheck

The PriorityCheck tool is primarily to be executed in the browser and requires an instance of the R software to run in the background. It can be executed either locally, for example on a laptop brought to a meeting, or online through an exposed sub-domain or website. Currently there is an instance of PriorityCheck running on a server run by IIASA (<https://prioritycheck.iiasa.ac.at/>), which at the time of writing is customised to the latest outputs from the NaturaConnect project (e.g. D7.1). However, the branding and inputs of each instance can easily be customised to different projects and user requirements by exchanging logos, text and input layers.

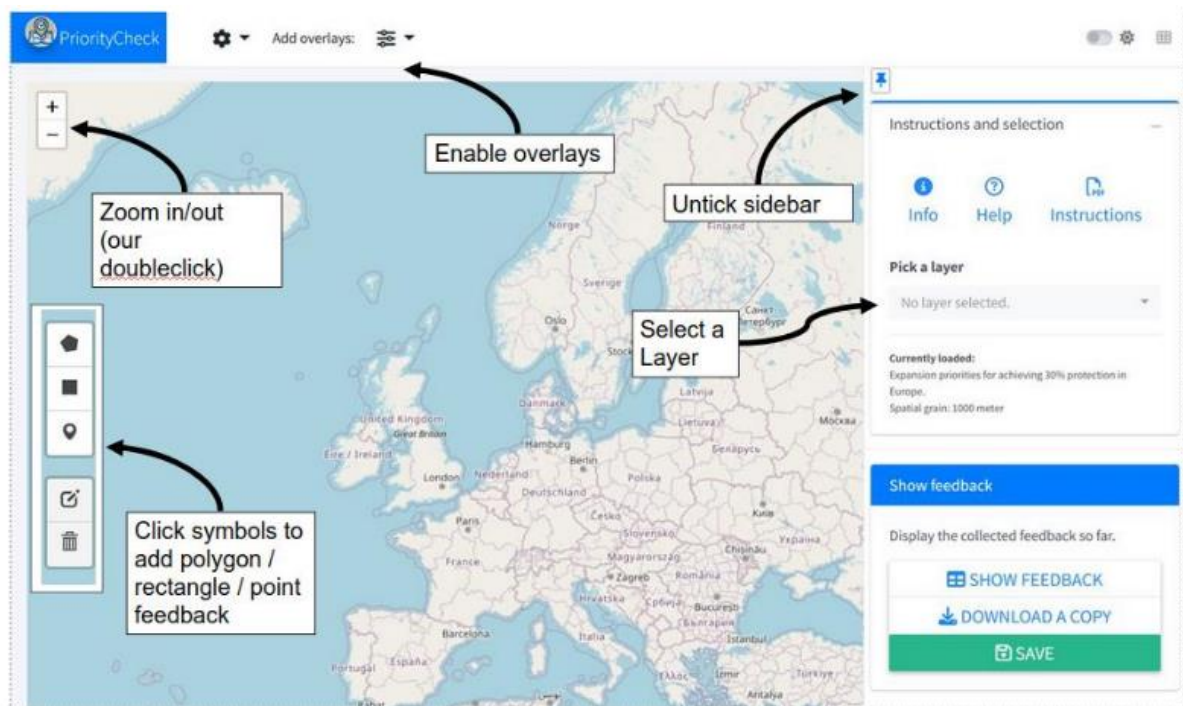


Figure 7: Screenshot of the PriorityCheck app, highlighting key UI elements and inactivity.

The PriorityCheck app is structured into a main map visualisation field and supporting User Interface (UI) elements. Users can navigate over different layers selected in the app, zoom in or out, or enable supporting overlays for further interpretation. For example, in the NaturaConnect project overlays such as existing Natura 2000 sites or the latest Key Biodiversity Areas can optionally be added to the map to guide interpretation and navigation. On the left side a toolbar with different icons reflecting points, rectangles or polygons are highlighted, which – upon clicking – enable the drawing of areas of interest (AOI) directly on the map (Figure 7). After a AOI has been drawn, a popup box will open where users can leave direct feedback on the area in the form of general agreement (through a ‘likert’-scale) and specific comment. All entered feedback can either be shown on screen, exported as comma-separated files (“download a copy) or directly saved on the server on which priorityCheck is running (Figure 7). Only information entered by users is stored on the server or can be exported, and no other data is collated or saved.

## Enter Comments for area

Thank you for providing feedback about this area. Please specify what type of feedback you would like to enter and provide more detail.

Current selected layer: Protection expansion (30% + 10%)

### Your choice:



### Provide a feedback remark to the selection above

This is an interesting selection, we were thinking of potentially scoping this area for expanding protected area expansions as previous local surveys have indicated high potential biodiversity value. It is interesting to see how this area connects to other areas with high potential nearby.

Cancel

Save

Figure 8: The PriorityCheck feedback entry form that appears once users draw a AOI on the map. It includes a likert-scale to indicate level of agreement and the specific comment on the area itself.





















A key functionality identified following initial utilisations of the tool (see Section 3.4) was the option to have users interrogate the map to identify which biodiversity features underly the selection of any particular area. Since version 1.4 of PriorityCheck this functionality has now been added to the tool (Figure 9). Once the query-functionality is enabled, clicking on any AOI on the map will return a small pop-up that a) summarises the overall number of biodiversity features (species, habitats, ecosystem services, etc...), b) returns a list of the target species ranked by their relative rarity across the whole prioritisation extent (rarest at the top), and c) the list of habitat contained within the AOI, also ranked by their relative rarity across the study extent. For both species and habitats lists there are few convenience icons and links added

that support quick online searches, and it is furthermore possible to export a full list as comma-separated file (Figure 9).

### Feature information

Clicked the following coordinates

Longitude: 17.1 Latitude: 47.717 Clicked Planning unit: 21064354

Species	Endemicity rank	Links
Helosciadium repens	1112	 
Cirsium brachycephalum	939	 
Podiceps nigricollis	926	 
Falco cherrug	898	 
Microcarbo pygmaeus	883	 
Falco vespertinus	834	 
Otis tarda	811	 
Acrocephalus melanopogon	797	 
Aquila heliaca	677	 
Lindernia procumbens	635	 
...	...	...


 Export species and habitat list
Close

Figure 9: Example of the ‘query’ functionality in the app, highlighting the target features contained within a specific grid cell or planning unit. Also shown are small icons for the functionality to search for the biodiversity features online or export them for further stakeholder interrogation.

### 3.4. Stakeholder use

The PriorityCheck tool serves an integral role in eliciting stakeholder feedback on the conservation and restoration prioritisation areas generated by the project, with subsequent changes to the layers being made by the project team to improve their accuracy and comprehensibility following stakeholder feedback. The following stakeholder events were organised using the PriorityCheck tool:

- The **Mapping the Future of Europe’s Protected Areas – Setting Priorities for Strategic Expansion** webinar on 22 May 2025. The event targeted policy makers and national authorities. During the webinar, the project team presented the spatial planning approaches used by the project to identify prioritisation areas for protection across Europe. This was followed by a demonstration of the PriorityCheck tool, showing participants how to explore and assess prioritisation areas in the tool and provide feedback on the validity, strengths, and potential gaps in the approach (Figure 10). The final part of the webinar featured breakout sessions with participants designed to collect targeted feedback via PriorityCheck and address questions about the prioritisation approach.

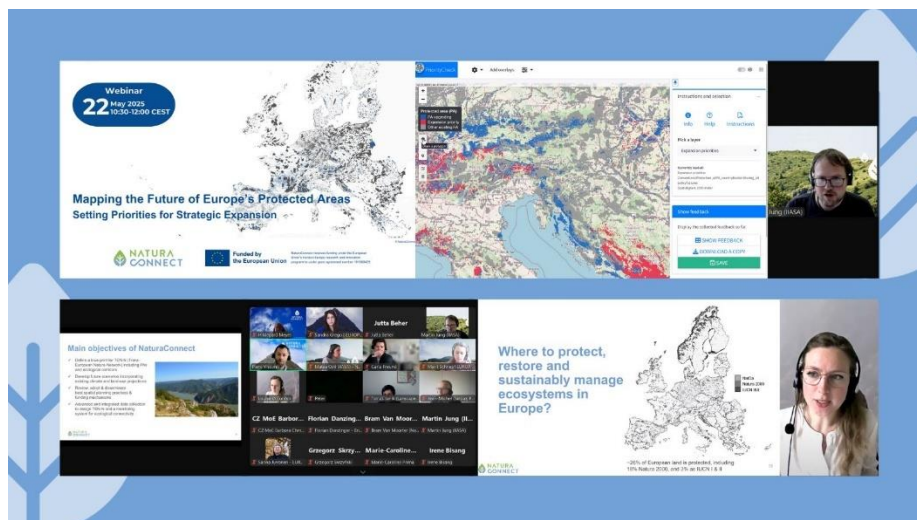


Figure 10: NaturaConnect stakeholder engagement event on providing feedback on prioritisation areas using the PriorityCheck tool, 22 May 2025. © NaturaConnect

Participants provided extensive feedback in the following weeks using PriorityCheck, including on the prioritisation methodology, terminology, data sources, and whether or not they agreed with conservation priority areas identified, and why. Several participants expressed the need to understand why a certain area had been selected as a conservation priority. A list of all feedback as well as how it has been addressed by the project is available [here](#) (link at bottom of page). The main changes implemented by the project team following feedback included fixing or adjusting errors in several input layers, improving the prioritisation constraints (including what is allocated in terms of area), integrating further data or information where available (e.g. on possible implementation challenges posed by land use), and adding functionality to the PriorityCheck tool to show why an area had been selected as a conservation priority. The webinar recording is available [here](#).

- A follow-up **Providing feedback on priority areas for implementing European area-based biodiversity targets** webinar on 17 March 2026. Participants with expertise in conservation policy, biodiversity (species or habitats), climate policy and Nature-based solutions, landscape or regional planning, and agriculture, forestry and fisheries attended the event. A range of sectors were represented, from national authorities to protected areas, NGOs, consultancies, universities and research institutes, and EU/EC institutions. The project team presented the methodology for the newly updated prioritisation areas for protection across Europe, and explained how feedback from stakeholders as part of the first webinar had been taken into account in the new prioritisation areas data. The presentation was followed by a demonstration of the PriorityCheck tool, and breakout sessions with participants (grouped by biogeographic region) to collect targeted feedback (Figure 11). Feedback is currently being submitted by participants (deadline April 2026), and will be analysed and addressed by the project team to the extent possible in the coming months. The webinar recording is available [here](#).

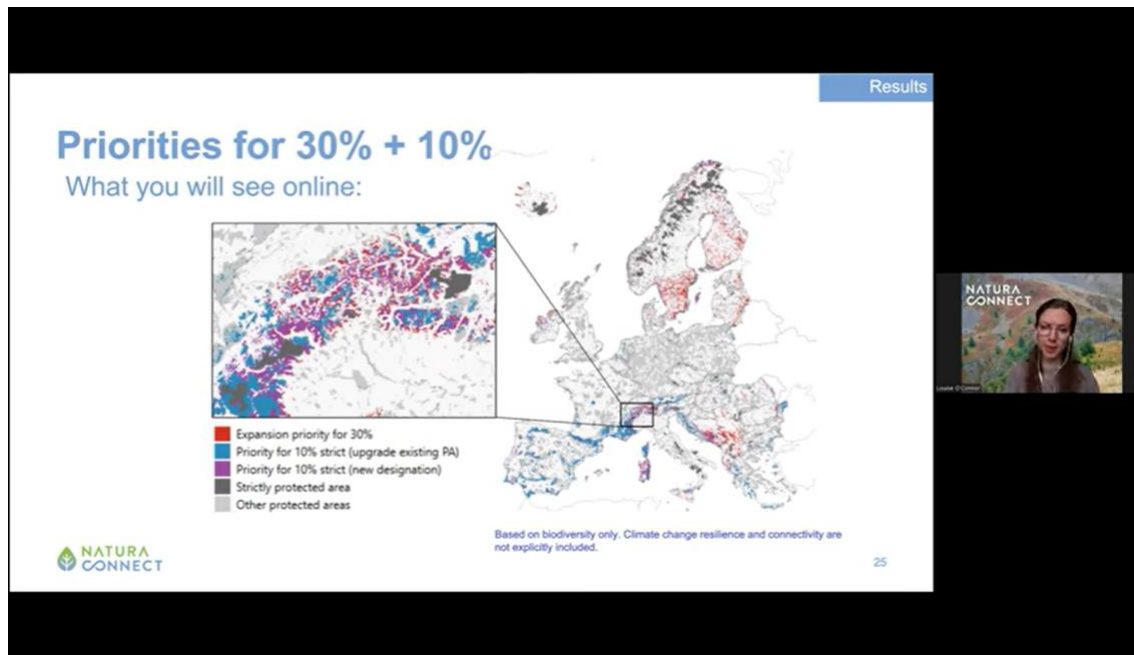


Figure 11: Follow-up NaturaConnect stakeholder engagement event on providing feedback on prioritisation areas data using the PriorityCheck tool, 17 March 2026. © NaturaConnect

In addition to the two webinars above, the PriorityCheck tool, along with NaturaConnector, was highlighted on 17 March 2026 to protected area managers, authorities and ministries attending the online [Siggen Seminar 2026 - Nature Restoration Plans: the path towards implementation](#). PriorityCheck generated interest among participants, with some planning to submit feedback on the restoration priority area layer featured in the tool. Any feedback received will be reviewed and addressed by the project team to the extent possible in the coming months.

### 3.5. Next steps

A presentation on the tool and lessons learned will be held at the 8th European Congress of Conservation Biology (ECCB) in 2026. The PriorityCheck tool itself will be publicly released as part of a manuscript (Jung et al. In prep), that describes both the tool and the lessons learned from the various engagements. Continued development and maintenance by IIASA are highly likely given the general usefulness in spatial planning projects. Indeed, there is already further anticipated impacts of usefulness as the tool will also be utilised in the Biodiversa+ funded INSPIRE project (<https://www.inspire-biodiversa.com/>). Further development steps include for example improved modularisation of query functionalities and multi-language support (through prepared language configuration files). The tool will be continued to be developed by the IIASA team beyond the lifetime of NaturaConnect, however can be downloaded and configured by external projects as well.

## 4. Infosheets for policy support

### 4.1. Rationale

Spatial planning workflows are increasingly complex, often producing multiple maps that identify priority conservation and restoration areas under alternative scenarios. To help navigate this complexity and provide a high-level synthesis of outputs associated with the development of the TEN-N, the project team created separate infosheets for 39 countries and 10 biogeographic regions. A key motivation for creating these infosheets was to assess the performance of spatial planning solutions and to generate a set of key takeaways specific to each geographic region. In this way, the infosheets complement the PriorityCheck tool, enabling stakeholders to engage with outputs at both local and landscape scales.

More specifically, infosheets were designed to address three main objectives:

1. Map existing protected areas and conservation priorities to visualise the spatial configuration of the TEN-N within individual regions.
2. Conduct a multi-criteria performance evaluation to compare conservation priorities to existing protected areas and generate tailored insights specific to each region.
3. Illustrate the performance of the TEN-N in each region relative to the mean performance of all other regions.

### 4.2. Methods

We developed a workflow to facilitate the semi-automatic creation of infosheets for each biogeographic region and country, using custom functions and an R Markdown template to iteratively extract and report on details of the TEN-N. In addition to addressing the three objectives stated above, each country infosheet contains embedded links to external dashboards including the Biodiversity Information System for Europe (BISE), Convention on Biological Diversity (CBD), and Protected Planet websites. These resources contain detailed accounts of the existing protected area network in each country, including, for example, statistics on the different IUCN management categories and governance types; status assessments of currently protected species and habitats; and overviews of the main pressures driving biodiversity loss. Including these links allowed us to maintain an explicit focus on the TEN-N.

In the infosheets, we differentiate between strict and conventional protection. Strict protected areas and expansion priorities represent areas in which human activities and resource extraction are relatively impermissible, with the intention of conserving and maintaining the integrity of biodiversity-rich natural areas. In contrast, conventional protected areas allow for a higher level and wider range of use, including for timber harvest, crop production, and ecotourism. Although the identification of strict and conventional expansion priorities can be sensitive to differences in spatial planning methodologies, including differences in feature weighting and penalty schemes (e.g., a higher versus lower preference given to biodiversity protection and/or ecosystem service provisioning), infosheets are not the most conducive instrument for supporting sensitivity analyses. As opposed to creating separate (and potentially conflicting) infosheets for individual planning solutions, we instead report on the TEN-N using consensus solutions. We identify consensus solutions by averaging spatial planning solutions across all scenarios such that consensus solutions (i.e., for strict and conventional protection) can be interpreted as “safe-bet” strategies for achieving the targets

of the EU Biodiversity Strategy and, more broadly, for addressing the goals of the Kunming-Montreal Global Biodiversity Framework.

All infosheets are available in .pdf format, each limited to two pages in length and consisting of the following elements:

1. A map and associated waffle plot, illustrating the distribution and percent coverage of existing protected areas and consensus solution priorities.
2. A circular barplot showing gains in the performance of conventional protected areas compared to that of the existing network.
3. A jitter plot that compares the relative performance of conventional protected areas across regions.

#### 4.2.1. Showcasing the configuration of the TEN-N

To showcase the configuration of the TEN-N, we include a map of existing protected areas and consensus solutions on the first page of each fact sheet. Below this map, we also include a waffle plot to summarise the network area of each protected area designation (e.g., strict protected areas, strict priority areas; Figure 12).

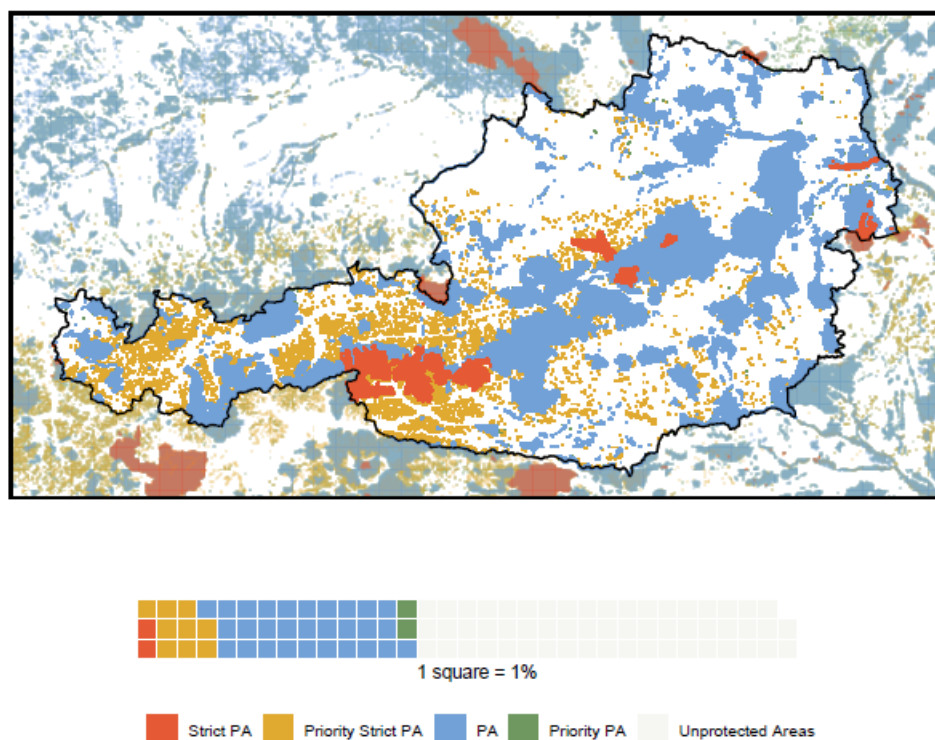


Figure 12: An example of the map for Austria, illustrating the locations of existing strict and conventional protected areas, in addition to the respective consensus solutions identified using spatial prioritisation analyses. The associated waffle plot is included to provide a summary of the total land area covered by each protected area designation.

#### 4.2.2. Evaluating the performance of the TEN-N

In Task 7.4, we developed a set of performance indicators to evaluate the performance of the TEN-N. In addition to quantifying traditional measures such as network area, feature representation, and connectivity, we generate novel area-based estimates of climate resilience, carbon storage and sequestration, and ecosystem service potential (e.g., pollination), among many others. Here, we use these performance indicators to conduct comparisons between existing protected areas and expansion priorities, and to assess the performance of the TEN-N across regions.

First, to compare the performance between consensus priorities and existing protected areas, we created circular barplots in which individual axes correspond to specific performance indicators. Inner bars were shaded to reflect the performance of existing protected areas, with performance ranging between 0% and 100% (e.g., 29.52% of land area in Austria is currently protected). Extending from the outer edge of each bar, we plotted a dashed line connected to a point that corresponds to the performance of the proposed consensus solution (i.e., existing protected areas + expansion priorities; Figure 13).

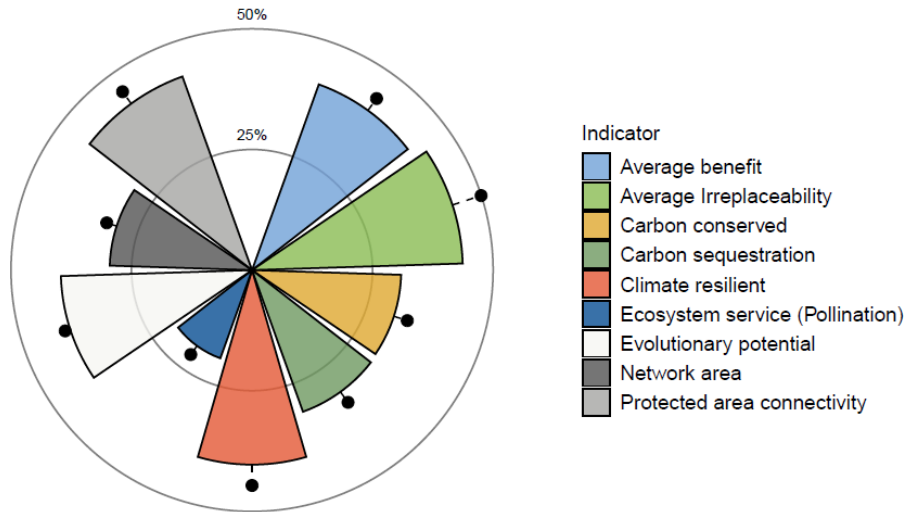


Figure 13: A circular barplot designed to support performance evaluations of the TEN-N. Coloured bars reflect the performance of existing protected areas, and black points correspond to gains in performance that could be achieved by protecting all identified expansion priorities.

Second, we created jitter plots to compare the relative performance of each focal region to the average performance across all regions. In doing so, we allow for a more detailed assessment of the dimensions in which the performance of regional conservation priorities is higher (or lower) than average (Figure 14).

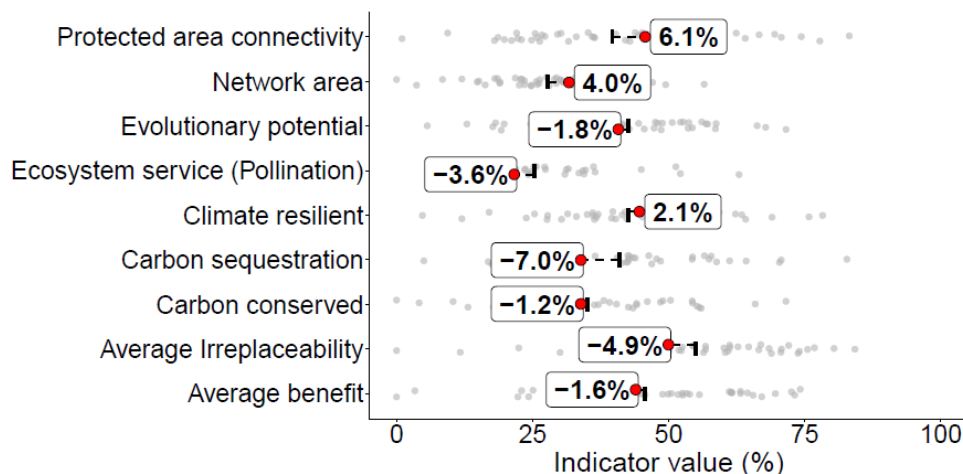


Figure 14: An example of the jitter plots used to facilitate comparisons across regions. All regions (e.g., countries) are shown as grey points, and mean performance is represented using vertical black lines. For each performance indicator (y-axis), the position of the focal region (e.g., Austria) is highlighted in red and further annotated to depict its performance relative to the mean.

### 4.3. Availability

All infosheets are publicly available on Zenodo and may be accessed [here \(Jung et al. 2026, https://doi.org/10.5281/zenodo.19170747\)](https://doi.org/10.5281/zenodo.19170747). Note that infosheets included under version 2025 reflect preliminary prioritisation outputs and are subject to change following recent stakeholder engagements and incorporation of feedback. New versions will be clearly dated based on the time of production on Zenodo (same repository).

## 5. Use and application

Integrated spatial planning outputs can provide decision-makers with critical insights in their consideration and planning of which areas to conserve and restore. The NaturaConnector platform and infosheets are policy support tools that can help inform decision-making at various scales and by various stakeholder groups, some key examples of which are described below. All underlying data from the NaturaConnector platform and infosheets are accessible online (see Section 7 for links to data sources), should stakeholders wish to build on the analyses for their own specific use cases.

**International policy makers and decision makers** such as the European Commission, regional conventions and international NGOs, can use these platforms to inform strategies and spatial priorities at international level, e.g. assessing nationally proposed designations of Sites of Community Importance, or Emerald network sites for their coherence and contribution to international targets (Visconti et al. 2024). These tools can also be used to assess candidate sites for trans-boundary protected areas, or other areas of transboundary conservation cooperation, e.g. transboundary Rewilding Landscapes of the Rewilding Europe network.

**National authorities** can use these policy support tools to visually explore different scenarios for expanding protected areas (including strictly protected areas) and restoration within their country. The data presented in the NaturaConnector platform can inform authorities' protected area planning in the context of TEN-N and the EU Biodiversity Strategy for 2030, as well as their Nature Restoration Regulation plans. Using the platform, authorities can explore alternative conservation and restoration scenarios across Europe; examine trade-offs between ecological outcomes, climate resilience, and land-use pressures; and assess how priorities change under different assumptions. Summary statistics at the country level (available also as downloadable country infosheets for policy support) also provide information for national authorities on current benefits provided by their existing protected area network, and the potential gains that could be achieved from strategic protected area expansion in a selected scenario.

**Protected area managers** can use these policy support tools as a starting point for comparing broader-level EU policy goals with planning and management actions at the site scale, now and in the future. Identified areas of importance for expanded protection, strict protection, restoration, as well as areas of importance for protected area expansion that have also been identified as climate resilient, can serve as valuable starting points for protected area managers considering on-the-ground management and expansion of protected areas.

**Regional and local authorities** can refer to these policy support tools to understand which areas could be important from a broader EU perspective, and compare this with policy goals and conservation activities taking place at the sub-national level. Regional and local authorities in other sectors such as those in spatial and urban planning, transportation, and energy can

also refer these outputs to inform their planning activities and ensure alignment with areas of conservation priority.

**Non-governmental Organisations (NGOs)** which manage sites and landscapes for conservation can use these policy support tools to help inform decisions on their future conservation and restoration of areas, including additional areas acquired for conservation purposes. Policy-focused NGOs can use the tools in their engagement with policymakers and funders on priority areas to conserve and restore in the future.

**Land use sector actors** in forestry, agriculture, energy, mining, and industrial development can utilise these tools to assess how their operations could reduce environmental impact and support conservation objectives. Seeing which areas are being identified as priorities for conservation and restoration can help these actors in assessing the current and future locations of their own activities, and directing their activities to areas that do not coincide with areas of priority for conservation.

It should be noted that while NaturaConnect and the infosheets will remain available long beyond the project lifespan, the PriorityCheck application was developed specifically as a tool to elicit spatially-explicit feedback and expertise from stakeholders on the priority areas in order to improve the prioritisation analyses during the project's lifetime. The tool itself will be made openly available with an upcoming publication, continues to be maintained by the IIASA team and can be adapted to other uses. The specific sub-domain on IIASA infrastructure however might be used for other similar projects as NaturaConnect.

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## 7. Data availability

The NaturaConnector platform can be accessed at: <https://naturaconnector.iiasa.ac.at/>

The PriorityCheck tool can be accessed at: <https://prioritycheck.iiasa.ac.at/prioritycheck/>

All indicator infosheets are publicly available on Zenodo:

<https://doi.org/10.5281/zenodo.19170747>

All data shown in the policy support tools is made available publicly on the [NaturaConnect Zenodo data repository](#): <https://doi.org/10.5281/zenodo.18863402>.



## 8. Annexes

### 8.1. PriorityCheck package dependencies

The following information has been created through the ‘grateful’ R-package. We are thankful for all R-package authors for maintaining critical dependencies.

#### 8.1.1. R packages used

Package	Version	Citation
arrow	23.0.0	Richardson et al. (2026)
assertthat	0.2.1	Wickham (2019)
base	4.5.1	R Core Team (2025a)
bs4Dash	2.3.5	Granjon (2025)
colourvalues	0.3.11	Cooley (2025a)
config	0.3.2	Allaire (2023)
data.table	1.18.2.1	Barrett et al. (2026)
DBI	1.2.3	R Special Interest Group on Databases (R-SIG-DB), Wickham, and Müller (2024)
desc	1.4.3	Csárdi, Müller, and Hester (2023)
devtools	2.4.6	Wickham, Hester, et al. (2025)
DT	0.34.0	Xie et al. (2025)
duckdb	1.4.4	Mühleisen and Raasveldt (2026)
gargoyle	0.0.1	Fay (2021)
geojsonsf	2.0.5	Cooley (2025b)
golem	0.5.1	Fay et al. (2024)
httpuv	1.6.16	Cheng, Chang, et al. (2025)
jsonify	1.2.3	Cooley (2025c)
knitr	1.51	Xie (2014); Xie (2015); Xie (2025)
leafem	0.2.5	Appelhans (2025)
leafgl	0.2.2	Appelhans (2024)
leaflet	2.2.3	Cheng, Schloerke, et al. (2025)
leaflet.extras	2.0.1	Gatscha, Karambelkar, and Schloerke (2024)
leafpop	0.1.0	Appelhans and Detsch (2021)
mapedit	0.7.0	Appelhans, Russell, and Busetto (2025)
Matrix	1.7.4	Bates, Maechler, and Jagan (2025)
pkgload	1.4.1	Wickham, Chang, et al. (2025)
PriorityCheck	1.3	Jung (n.d.)
R6	2.6.1	Chang (2025)
renv	1.1.7	Ushey and Wickham (2026)

Package	Version	Citation
rmarkdown	2.30	Xie, Allaire, and Golemund (2018); Xie, Dervieux, and Riederer (2020); Allaire et al. (2025)
rsconnect	1.7.0	Atkins et al. (2025)
scales	1.4.0	Wickham, Pedersen, and Seidel (2025)
sever	0.0.7	Coene (2021)
sf	1.0.24	Pebesma (2018); Pebesma and Bivand (2023)
shiny	1.12.1	Chang et al. (2025)
shinyjs	2.1.1	Attali (2026)
shinyWidgets	0.9.0	Perrier, Meyer, and Granjon (2025)
spelling	2.3.2	Ooms and Hester (2025)
terra	1.8.93	Hijmans (2026)
testthat	3.3.2	Wickham (2011)
tidyverse	2.0.0	Wickham et al. (2019)
tools	4.5.1	R Core Team (2025b)
usethis	3.2.1	Wickham, Bryan, et al. (2025)
uuid	1.2.2	Urbanek and Ts'o (2026)
waiter	0.2.5.1	Coene (2025)
whereami	0.2.0	Sidi and Müller (2022)
yaml	2.3.12	Stephens and Simonov (2025)

We used R v. 4.5.1 (R Core Team 2025a) and the following R packages: arrow v. 23.0.0 (Richardson et al. 2026), assertthat v. 0.2.1 (Wickham 2019), bs4Dash v. 2.3.5 (Granjon 2025), colourvalues v. 0.3.11 (Cooley 2025a), config v. 0.3.2 (Allaire 2023), data.table v. 1.18.2.1 (Barrett et al. 2026), DBI v. 1.2.3 (R Special Interest Group on Databases (R-SIG-DB), Wickham, and Müller 2024), desc v. 1.4.3 (Csárdi, Müller, and Hester 2023), devtools v. 2.4.6 (Wickham, Hester, et al. 2025), DT v. 0.34.0 (Xie et al. 2025), duckdb v. 1.4.4 (Mühleisen and Raasveldt 2026), gargoyl v. 0.0.1 (Fay 2021), geojsonsf v. 2.0.5 (Cooley 2025b), golem v. 0.5.1 (Fay et al. 2024), httpuv v. 1.6.16 (Cheng, Chang, et al. 2025), jsonify v. 1.2.3 (Cooley 2025c), knitr v. 1.51 (Xie 2014, 2015, 2025), leafem v. 0.2.5 (Appelhans 2025), leafgl v. 0.2.2 (Appelhans 2024), leaflet v. 2.2.3 (Cheng, Schloerke, et al. 2025), leaflet.extras v. 2.0.1 (Gatscha, Karambelkar, and Schloerke 2024), leafpop v. 0.1.0 (Appelhans and Detsch 2021), mapeedit v. 0.7.0 (Appelhans, Russell, and Busetto 2025), Matrix v. 1.7.4 (Bates, Maechler, and Jagan 2025), pkgload v. 1.4.1 (Wickham, Chang, et al. 2025), PriorityCheck v. 1.3 (Jung, n.d.), R6 v. 2.6.1 (Chang 2025), renv v. 1.1.7 (Ushey and Wickham 2026), rmarkdown v. 2.30 (Xie, Allaire, and Golemund 2018; Xie, Dervieux, and Riederer 2020; Allaire et al. 2025), rsconnect v. 1.7.0 (Atkins et al. 2025), scales v. 1.4.0 (Wickham, Pedersen, and Seidel 2025), sever v. 0.0.7 (Coene 2021), sf v. 1.0.24 (Pebesma 2018; Pebesma and Bivand 2023), shiny v. 1.12.1 (Chang et al. 2025), shinyjs v. 2.1.1 (Attali 2026), shinyWidgets v. 0.9.0 (Perrier, Meyer, and Granjon 2025), spelling v. 2.3.2 (Ooms and Hester 2025), terra v. 1.8.93 (Hijmans 2026), testthat v. 3.3.2 (Wickham 2011), tidyverse v. 2.0.0 (Wickham et al. 2019), tools v. 4.5.1 (R Core Team 2025b), usethis v. 3.2.1 (Wickham, Bryan, et al. 2025), uuid v. 1.2.2 (Urbanek and Ts'o 2026), waiter v.

0.2.5.1 (Coene 2025), whereami v. 0.2.0 (Sidi and Müller 2022), yaml v. 2.3.12 (Stephens and Simonov 2025).

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### More information about the project:

NaturaConnect has 22 partner institutions: International Institute for Applied System Analysis (project lead; Austria); German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig (project co-lead; Germany); Associacao Biopolis (Portugal); BirdLife Europe (Netherlands); Birdlife International (United Kingdom); Centre National De La Recherche Scientifique (France); Doñana Research Station - Agencia Estatal Consejo Superior De Investigaciones Cientificas (Spain); Europarc Federation (Germany); Finnish Environment Institute (Finland); Humboldt-University of Berlin (Germany); Institute for European Environmental Policy (Belgium); Netherlands Environmental Assessment Agency (Netherlands); Rewilding Europe (Netherlands); University of Evora (Portugal); University of Helsinki (Finland); University of Natural Resources and Life Sciences, Vienna (Austria); University of Rome La Sapienza (Italy); University of Warsaw (Poland); Vrije University of Amsterdam (Netherlands); WWF Central and Eastern Europe (Austria); WWF Romania and WWF Hungary.



**NaturaConnect** aims to design and develop a blueprint for a truly coherent **Trans-European Nature Network** (TEN-N) of conserved areas that protect at least 30% of land in the European Union, with at least one third of it under strict protection. Our project unites universities and research institutes, government bodies and non-governmental organizations, working together with key stakeholders to create targeted knowledge and tools, and build the capacity needed to support European Union Member States in realizing an ecologically representative, resilient and well-connected network of conserved areas across Europe.

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**Funded by  
the European Union**

NaturaConnect receives funding under the European Union's Horizon Europe research and innovation programme under grant agreement number 101060429.