TRANSPONDER

TRANSnational biodiversity and ecosystem assessment approaches for PONDscapes in EuRope

DURATION
1/04/2024 – 30/06/2027

BUDGET
210 854 €

PROJECT DESCRIPTION

Ponds and networks of ponds (i.e. pondscapes) are increasingly recognized as key habitats for freshwater biodiversity, due to their role as stepping-stone habitats and refuges for rare species, and because of their cumulatively high contribution to regional freshwater diversity. Small standing waters are abundant in landscapes, and contribute important ecosystem services. Yet, they are exposed to many of the same threats affecting larger waters (e.g., changes in land and water use, pollution or invasive species). As they are poorly buffered against temperature extremes and changes in hydrology owing to their small surface area and volume, they are often particularly vulnerable to disturbance and climate change, impacting both their number and ecological quality. However, and despite their importance and high abundance in landscapes, they are largely neglected in water- and nature related national and EU policies and strategies and are not included in most freshwater monitoring programs. Such hinderance of their monitoring makes it difficult to assess the degree to which they have been impacted by human activity and climate change, which ultimately impedes our ability to assess biodiversity trends in freshwaters in general.

In order to improve our capacity to monitor biodiversity in ponds and pondscapes, TRANSPONDER aims to develop a monitoring protocol for these systems that is characterized by (i) being highly standardized while also being practical and applicable to different types of ponds and different climatic zones and land use contexts; (ii) coverage of both abiotic and biodiversity variables across different key taxonomic groups that capture different aspects of pond biota and functioning and its relationship to the terrestrial landscape and other drivers of biodiversity; (iii) coverage of both taxon, functional (providing a synthetic summary linked to ecosystem functioning) and genetic diversity (reflecting evolutionary potential, in both zooplankton and macrophytes); (iv) a high level of automatization (sensors, eDNA, artificial intelligence aided identification of zooplankton and macroinvertebrates, remote sensing) that will allow time- and resource effective sampling enabling a broader coverage. TRANSPONDER will engage with different stakeholder groups to (a) explore interests to apply pond monitoring and incorporation of ponds and pondscapes in policies and monitoring activities; (b) co-develop the monitoring protocols to facilitate uptake and implementation by different actors; and (c) simplify the monitoring protocols so that they become amenable for citizen-mediated monitoring allowing further expansion of the scope of monitoring.

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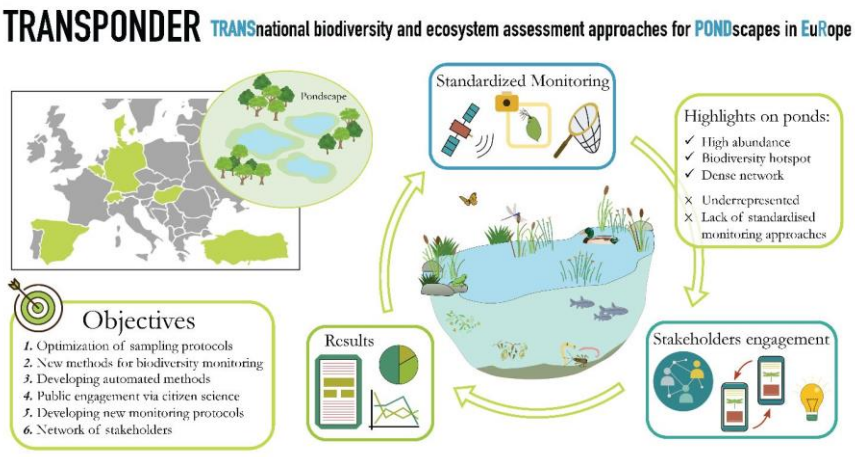
To achieve this goal, TRANSPONDER is divided in four work packages that will be developed in parallel and inform each other. In WP1, we will make use of existing data, as well as newly collected data through targeted field sampling and novel methodological approaches across 7 European countries – Belgium, Denmark, Hungary, Switzerland, Spain, Turkey and Germany - to (i) develop and optimize a standardized methodology to assess the biodiversity of ponds and (ii) investigate a wide spectrum of biodiversity measures for inclusion in a standardized monitoring protocol that also includes functional and genetic diversity in key taxa. In WP2, we will assess how enhanced automatization fostering high-throughput analyses can be integrated into assessments of pond biodiversity. WP3 focuses on the development of optimized generally applicable monitoring protocols, based on the data and methodological developments obtained in WP1 and WP2. With WP3, we additionally aim to develop simplified versions of monitoring protocols using proxies that can support large-scale and citizen-driven monitoring projects. In WP4, we will engage stakeholders at both the regional and European level, aiming at (i) co-development of monitoring protocols, (ii) raising the profile of ponds and their key role in biodiversity conservation and policy, (iii) stimulating uptake of pond and pondscape biodiversity monitoring schemes, and (iv) integrating pond data into key existing platforms.

The outcome of TRANSPONDER will be highly relevant to society as the project seeks to co-develop, with key stakeholders, appropriate methods to assess biodiversity status in ponds and pondscapes, an all too frequently overlooked ecosystem type. Ponds and pondscapes have the potential to provide landscape scale resilience to the threats of biodiversity loss and climate change and could play a key part in the restoration of biodiversity at the landscape and regional scale. TRANSPONDER aims to ultimately provide transnationally applicable methods to assess the status and trends of pond and pondscape biodiversity. An important additional societal value of developing such approaches is that they can be used to assess the success of restoration measures and nature-based solutions involving pond systems.



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LINKS

KU Leuven webpages of TRANSPONDER :
https://bio.kuleuven.be/eeb/ldm/transponder
https://research.kuleuven.be/portal/en/project/3E240357

Social media account of the research group:
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