Ponderful

PONDS FOR CLIMATE



PONDERFUL Project Launch

10th June 2021

Delegate Pack

Pond Ecosystems for Resilient Future Landscapes in a Changing Climate

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No ID 869296

Contents

Ponderful
PONDS FOR CLIMATE

www.ponderful.eu @ponds4climate
#PONDERFUL

What is PONDERFUL?

PONDERFUL (POND Ecosystems for Resilient Future Landscapes in a changing climate) is a H2020 "Research and Innovation Programme" project funded by the European Union within the Call: Inter-relations between climate change, biodiversity and ecosystem services.

The significance of ponds has long been underestimated and they lie largely outside regulatory systems. However, thanks to their abundance, heterogeneity, exceptional biodiversity inherent naturalness and biogeochemical potency, ponds play a crucial role in catchments, landscapes, and potentially at continental scale which is completely out of proportion to their small size.

The overarching aim of the project, led by the University of Vic (Spain), is to develop improved methods for maximising the use of ponds and pondscapes to mitigate and adapt to climate change, protect biodiversity and the delivery of ecosystem services.

Our Objectives

1. Evaluate the interactions and feedbacks between **biodiversity, ecosystem services and climate** in pondscapes at multiple spatial scales.
2. Together with stakeholders, develop **future scenarios** for pondscapes in the context of climate change, land use change, and changed policies.
3. Develop and test the implementation of effective **Nature-based solutions** in close collaboration with the stakeholders using **DEMOnstration sites**.
4. Communicate, disseminate and exploit project's results.

30-50% of standing water worldwide

70% of regional freshwater species pool in European landscapes, many of them rare, endemic or threatened species

50-90% of of pond losses in European countries over the past century

Significant role in mitigating and adapting to climate change

Ponds deliver multiple ecosystem services and NPCs: carbon shortage, water provisioning, flood control, groundwater recharge, pollution amelioration, recreation

Implementation of ponds and pondscapes as Nature-Based Solutions for climate change mitigation and adaptation, biodiversity conservation and delivery of ecosystem services

Programme

Dr. Jeremy Biggs, Freshwater Habitats Trust, will chair the event.

All times are Central European Summer Time (CEST).

15:00 – 15:05: Dr Jeremy Biggs, Freshwater Habitats Trust – Opening film.

15:05 – 15:15: Dr. Tobias Salathé, Ramsar – Welcome.

15:15 – 15:45: Prof. Sandra Brucet, ICREA & University of Vic – Central University of Catalonia (UVic-UCC) – Introducing the PONDERFUL project.

15:45 – 16:15: Prof. Luc De Meester, Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB) – Effect of climate change on biodiversity, ecosystem functions and services and their interactions in ponds.

16:15 – 16:45: Prof. Beat Oertli, The University of Applied Sciences and Arts of Western Switzerland (HES-SO) – Nature-based solutions and management to mitigate and adapt to climate change.

16:45 – 17:30: Prof. Lenore Fahrig, Carleton University – The biodiversity value of small ponds, and how to protect them.

17:30: Finish.

The Speakers

Dr Tobias Salathé
Senior Advisor for Europe, RAMSAR

Tobias received his MSc. and PhD degrees from Basel University and has worked with ICBP (now BirdLife International) and DG XI of the European Commission, among other posts, and most recently with the Station Biologique de la Tour du Valat in Arles, France. He speaks and writes all of the Ramsar languages and German as well, and is the author of a large number and variety of research reports and other publications. He joined the Secretariat in 1999.

Prof. Lenore Fahrig
Chancellor's Professor of Biology and co-director of the Geomatics and Landscape Ecology Research Laboratory (GLEL), Carleton University.

Lenore Fahrig is a highly cited researcher with over 50,000 citations (Google Scholar). She is a Fellow of the Royal Society of Canada (RSC), a Guggenheim Fellow, recipient of the RSC Miroslaw Romanowski medal for Environmental Science, and recipient of the Distinguished Landscape Ecologist Award from the North American Association for Landscape Ecology and the President's Award from the Canadian Society for Ecology and Evolution. Lenore and her students research the effects of landscape structure on biodiversity and the abundance, distribution and persistence of wildlife populations. Study species include frogs and toads, turtles, birds, mammals, insects, other arthropods, plants and lichens. Landscape structure includes the amounts of various kinds of land cover in a landscape (e.g., forest, wetland, roads, crop fields), and the spatial arrangement of these cover types.

Dr Jeremy Biggs
Director, Freshwater Habitats Trust
PONDERFUL Workpackage 5 Lead

Dr. Jeremy Biggs is co-founder and Director of the Freshwater Habitats Trust, which currently has 15 staff working throughout the UK as well as co-ordinating activities of c2,500 volunteers. He is also a Director of the Newt Conservation Partnership undertaking practical pond conservation work for Great Crested Newts. He has supervised 4 PhD students and has 108 publications. He has 25+ years of international research and practical conservation experience originating in LIFE funded collaborations with local authorities in Denmark in the mid-1990s. He has developed and project managed a wide range of national and international research and practical conservation projects including work in UK, France, Germany, Denmark, Poland and Hungary. He writes regularly for popular nature magazines, and has made multiple radio and TV appearances for FHT. He is a co-founder, former President and current Steering Committee member of the European Pond Conservation Network.

Prof. Sandra Brucet
University of Vic—Central University of Catalonia & ICREA (Catalan Institution for Research and Advanced Studies)
PONDERFUL Project Leader
Aquatic ecologist. She is an ICREA Research Professor (https://www.icrea.cat/en) at University of Vic and the head of the GEA Group. She has participated in 7 European projects (2 of them as principal investigator) and was principal investigator of several national projects. She has more than 9 years of international research experience including long-term stays at the University of Oslo (Norway), Aarhus University (Denmark), European Commission-Joint Research Centre (Italy), and Middle East Technical University (Turkey). She was a Marie Curie Intra-European Fellowship at the University of Aarhus. From 2009 to 2012, she worked in the European Commission-Joint Research Centre being a member of the Steering Committee of the Water Framework Directive Intercalibration Exercise, among other responsibilities. She is Lead Author of IPBES Regional Assessment for Europe and Central Asia.

Prof. Luc De Meester
Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB) / PONDERFUL Workpackage 2 Lead
Dr. Luc De Meester. Full professor in the Department of Biology, he has >25 years of experience in aquatic ecological research, including local and landscape perspective work on biodiversity, community composition and ecosystem functioning using ponds and shallow lakes as model systems. Much of his work is oriented towards responses of aquatic systems to global change (warming, urbanization, eutrophication, pesticide use) using zooplankton and the water flea Daphnia as a model system. LDM was main supervisor of 35 PhDs and hosted >20 postdocs for at least one year. He has also been deeply involved in the training of scientists of southern countries, notably Bolivia (2 PhDs under his supervision) and Ethiopia (6 PhDs under his supervision).

Prof. Beat Oertli
The University of Applied Sciences and Arts of Western Switzerland (HES-SO).
PONDERFUL Workpackage 4 Lead
Dr. Beat Oertli is ordinary Professor at HEPIA, head of the Master Research Unit "Natural Resource Management", and head of the laboratory of Ecology. He was leader of 18 programs of applied research conducted in relation with stakeholders, in Switzerland, Europe and South-America. His research is mainly focused on small waterbody conservation, with the production of many tools directed to practical application by stakeholders. This applied aspect is also coupled with an internationally recognized scientific production, with several highly cited papers and several books or book chapters. He has several Editorial activities and has reviewed about 400 papers, and actively takes part in organizations of international conferences. He has supervised 1 post-Doc, 2 PhD students (and 2 as co-supervisor), 22 Master students and he participated in the examination of 20 PhD thesis.

The Talks

Introducing the PONDERFUL project

Prof. Sandra Brucet

Largely neglected and generally undervalued, ponds and pondscapes (networks of ponds) are crucial for biodiversity conservation. PONDERFUL is a multi-partner EU Horizon 2020 funded project running from 2021-24 that will investigate the role of ponds in protecting freshwater biodiversity, delivering ecosystem services, and helping mitigate and adapt to climate change impacts. In this presentation, we will introduce the aims of the PONDERFUL project, briefly update current knowledge on the role of ponds in European landscapes, describe the contributions they make to delivering ecosystem services and summarise the main areas of uncertainty that the PONDERFUL project is investigating.

Effect of climate change on biodiversity, ecosystem functions and services and their interactions in ponds

Prof. Luc De Meester

In this presentation we will describe the biodiversity modelling and climate gases components of PONDERFUL. A central aim of the project is to establish the extent to which biodiversity (richness and composition of biotic communities) is linked to ecosystem functioning, particularly generation of greenhouse gases. In the course of the project we will be undertaking the first pan-European analysis of these interaction. In addition, in the presentation we will briefly review current knowledge of the biodiversity contribution of ponds, with a subsequent major output of PONDERFUL being collation of existing Europe-wide datasets to provide the basis for modelling and advice outputs.

Pond nature-based solutions and management to mitigate and adapt to climate change

Prof. Beat Oertli

Ponds and pondscapes deliver several nature contributions to people (NCP), as habitats for biodiversity, climate regulation, regulation of hazards, pollination, and physical and psychological experiences. This is especially true when nature-based solutions (NBS) are implemented in the pondscapes. Indeed, these NBS, including pond creations, pond restorations and pond/pondscape management actions, can collectively enhance the potential of pondscapes to deliver the NCP, contributing to human well-being, to biodiversity conservation and helping mitigate, and adapt to climate change impacts. PONDERFUL will provide detailed data and will develop guidance for stakeholders for planning and management of ponds and pondscapes as NBS for climate change adaptation and mitigation, delivery of ecosystem services and functions, and biodiversity conservation. In particular, 15 DEMO-sites in seven European (Belgium, Denmark, Germany, Spain, Switzerland, Turkey, UK) and one CELAC (Uruguay) countries will be investigated in close collaboration with stakeholders, for the assessments of several implemented NBS, for demonstrating their efficiency to deliver NCP.

The biodiversity value of small ponds, and how to protect them

Prof. Lenore Fahrig

In many human-dominated regions of the world, wetlands have been drained and filled for agriculture, urbanization and road-building. Remaining wetlands are often small, and small wetlands are often given little protection on the assumption that they have low biodiversity value. I show that this assumption contrasts with available data, which suggests that, on a per-area basis, small wetlands (ponds) have disproportionately high biodiversity value. I discuss likely reasons why the bias against small wetlands persists, despite the evidence. Finally, I show that protection of wetlands means more than protecting the wetland and its buffer. It also requires reducing human impacts in the surrounding landscape.

Pond Resources

We have added to the delegate pack a small selection of research papers and examples of practical guidance documents that exist now which we think are interesting or important.

The selection is not comprehensive or exhaustive but is a personal selection of some we think you will find interesting, for a variety of reasons.

Many people and organisations across Europe have written guides to ponds, and produced hundreds of interesting scientific reports and papers about them. In the course of PONDERFUL we hope to make many of these better known to you, adding to them and synthesising their results to help produce the main project outputs.

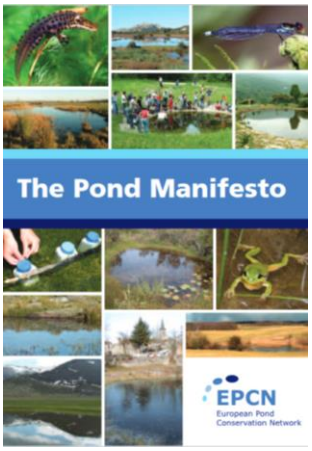
Policy and practice

1. Ramsar Convention Resolution XIII.21 on the Conservation and Management of Small Wetlands, which include: springs, ponds, headwater streams and other small freshwater and wetland habitats, is a globally important policy document for ponds. Links here: https://www.ramsar.org/document/resolution-xiii21-conservation-and-management-of-small-wetlands.

Resolution XIII.21

Conservation and management of small wetlands

2. The Pond Manifesto produced by the European Pond Conservation Network (in English, also available in five other languages): http://www.europeanponds.org/publications/epcn-publications/



3. The Million Ponds Project toolkit: Overview of range of documents on pond creation produced by PONDERFUL partner Freshwater Habitats Trust (with links to all parts of the toolkit documents here: https://freshwaterhabitats.org.uk/projects/million-ponds/pond-creation-toolkit/

4. Mediterranean Temporary Pond best practice management guide: from the LIFE Charcos Project in South-West Portugal – an example of a modern guide to pond conservation and management (in Portuguese).

5. Guide to urban pond management with particular reference to biodiversity, from HES-SO, Swiss members of the PONDERFUL team (in French).

Research results

We have attached just four papers that we think are interesting for different reasons from the many thousands of publications on freshwaters and ponds:

6. The recent (2020) paper of Marrone and colleagues emphasising the undiscovered biodiversity of 'difficult' groups, in this case copepods, in ponds. At the same time the paper shows some nice pictures of what ponds actually look like, and provides interesting summary information about their biotas and ecology – including other endangered and endemic species.


water

On the Occurrence of *Metadiaptomus chevreuxi* (Calanoida, Diaptomidae, Paradiaptominae) in the Iberian Peninsula, With Notes on the Ecology and Distribution of its European Populations

7. The excellent detailed overview by Boix and colleagues of the biodiversity of the invertebrates of temporary ponds in Mediterranean climates – which occur on five continents, not just in Europe. This is great introduction to the invertebrates – one of our favourite group of organisms - in these globally important habitats.


Chapter 5
Invertebrates of Freshwater Temporary Ponds in Mediterranean Climates

Introduction to Mediterranean Temporary Ponds

Long Known But Neglected Until Recently

8. Dispersal between ponds (and other freshwater habitats): the paper of Smith and colleagues shows us the major routes of dispersal of freshwater organisms and prompts questions about how those routes are disrupted and can be re-established.


LETTER

Dispersal failure contributes to plant losses in NW Europe

9. The work of US researchers on freshwater habitat networks part of an important group of papers. This work is not well known in Europe yet provides important support for ‘European’ ideas of the importance of small waters and the importance of networks of freshwater habitats. Some aspects of the interpretation described, that small waters, by implication, exist to protect ‘more important’ downstream water will inevitably raise the hackles of pond lovers! But nevertheless these are important intellectual allies.

JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION

FEATURED COLLECTION INTRODUCTION: CONNECTIVITY OF STREAMS AND WETLANDS TO DOWNSTREAM WATERS[1]

Ponderful

Coordinator: Prof. Sandra Brucet, University of Vic – Central University of Catalonia

Project Manager: Dr. Diana van Gent, University of Vic – Central University of Catalonia

Contact: diana.vangent@uvic.cat

Duration: 1 December 2020 to 1 December 2024

Website: www.ponderful.eu

Facebook: /Ponderful-331847228188664

Twitter: @ponds4climate

Instagram: @ponds4climate

Pond Ecosystems for Resilient Future Landscapes in a Changing Climate

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No ID 869296