Ponderful

PONDS FOR CLIMATE



Deliverable 5.12

Publish newsletters (PONDERFUL News and Freshwater Reports) with updates of second year

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

Ponderful Partners:

University of Vic – Central University of Catalonia (Spain) – Prof. Sandra Brucet (PI, Project Coordinator), Dr. Diana van Gent (Project Manager)

IGB im Forschungsverbund Berlin (Germany) – Dr. Thomas Mehner (PI, WP2 co-coordinator)

Katholieke Universiteit Leuven (Belgium) – Prof. Luc De Meester (PI, WP2 coordinator)

Haute Ecole Spécialisée de Suisse occidentale (Switzerland) – Prof. Beat Oertli (PI, WP4 coordinator)

Universitat de Girona (Spain) –Dr. Dani Boix (PI)

Ecologic Institut gemeinnützige GmbH (Germany) – Dr. Manuel Lago (PI)

University College London (UK) –Dr. Carl Sayer (PI)

Middle East Technical University (Turkey) – Prof. Meryem Beklioğlu (PI)

CIIMAR - Interdisciplinary Centre of Marine and Environmental Research (Portugal) –Dr. José Teixeira (PI, WP5 co-coordinator)

Aarhus University (Denmark) – Dr. Thomas A. Davidson (PI)

Uppsala University (Sweden) –Dr. Malgorzata Blicharska (PI, WP1 coordinator)

Bangor University (UK) – Dr. Sopan Patil (PI, WP3 coordinator)

Technical University of Munich (Germany) – Prof. Johannes Sauer (PI)

I.S.A.R.A. – Institut Supérieur d'Agriculture Rhône-Alpes (France) – Dr. Joël Robin (PI)

Freshwater Habitats Trust (UK) – Dr. Jeremy Biggs (PI, WP5 co-coordinator)

Universidad de la República (Uruguay) – Dr. Mariana Meerhoff (PI)

Randbee Consultants SL (Spain) – Juan Arevalo Torres (PI)

Amphi International APS (Denmark) – Lars Briggs (PI)

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Authors:
José Teixeira and Marisa Naia, CIIMAR
Sarah Hoyle, FHT
Beatriz Martin, Randbee

Contributors:
All PONDERFUL Consortium

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Executive Summary

The PONDERFUL e-mail newsletter aims to strengthen the external communication of the project. The first issue was released in August 2021 and was incorporated in the D5.10 - Publish newsletters (PONDERFUL News and Freshwater Reports) with updates of first year, together with the second issue. The current document includes the technical information of the newsletters, as well as the third and fourth issue of PONDERFUL newsletters, released in 2022.

Email newsletters are emails sent periodically to an email list of subscribers. The PONDERFUL News and Freshwater Reports is a biannual e-mail newsletter, which aims to provide relevant information on the main activities of the project, such as updates on the work undertaken by PONDERFUL partners, as well as fieldwork details and news and events. Each newsletter has a section called Freshwater Reports that provides a review of some papers and events of general interest for freshwater ecologists that are thought or action provoking. The newsletter also lists PONDERFUL and other pond-related events. With the advance of the project and the release of its results, PONDERFUL has getting more media attention, which has been featured in these last two issues of the newsletters, as well as recent papers published within the project.

We used the Mailchimp marketing platform to create newsletter campaigns and manage our audience, which to date contains 308 subscribers, an increase of 33% in the number of subscribers comparing to the same date in 2021. Figure 1 shows the number of subscribers by country. In 2022, the newsletter was sent to a list of subscribers in August and November, these newsletters are presented below.

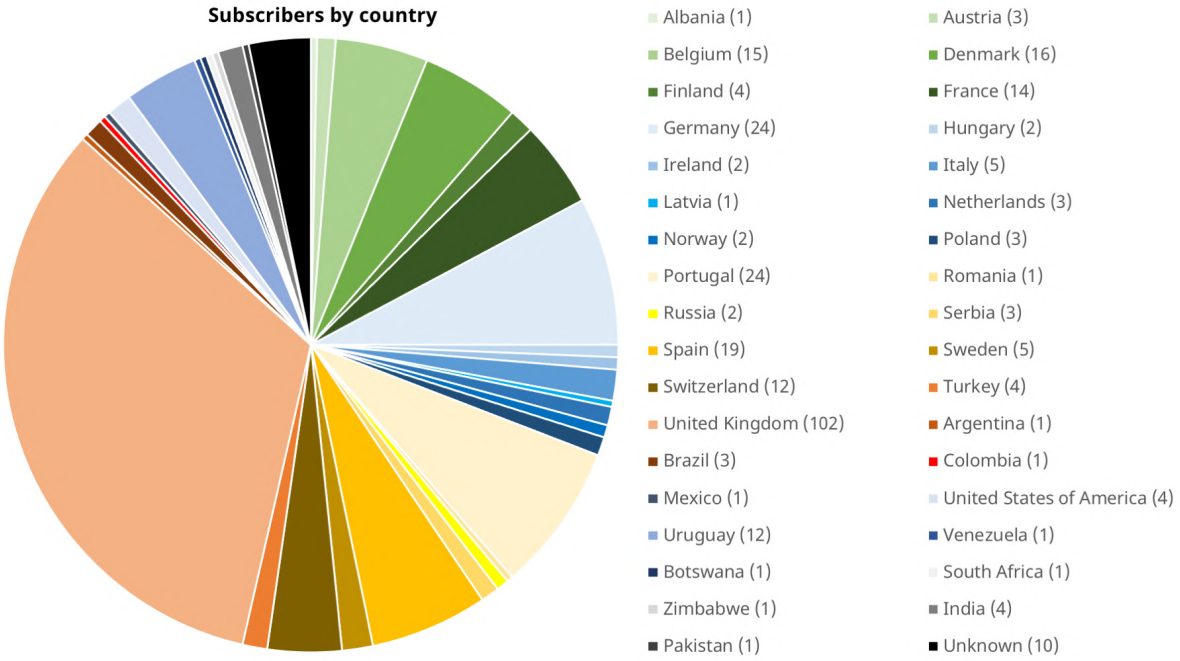

Figure 1. Number of subscribers by country.

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PONDERFUL News and Freshwater Reports

Issue No. 3

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.

Meet our team members

Dr. Tom Davidson - Senior Researcher, Department of Ecoscience, Aarhus University

Tom Davidson (right) with his research team.

I'm a freshwater ecologist, working at the ecosystem scale, and I'm interested in how we can best manage our natural world to preserve biodiversity and keep the natural world healthy. I have a background of working with both zooplankton and macrophyte ecology and palaeoecology.

Tom Davidson (2nd from left) with his research team.

After completing a Masters at King's College London and working at the Environmental Change Research Centre, I started a PhD focusing on

of projects, mostly with a focus on submerged plants. In 2010, I moved to Aarhus University in Denmark, where I was lucky enough to get a Marie Curie fellowship. Here, I have continued working on lakes on a range of sizes, from the Arctic to the tropics. A highlight came when our work on methane emissions from our experiment was on the cover of Nature Climate Change.

Over the last few years I've become increasingly interested in the role of lakes and ponds in the global carbon cycle and how human activity alters the emissions of greenhouse gases from lakes and ponds.

Read more >>

Have a look at what we are doing

First in-person PONDERFUL Consortium Meeting in Portugal

PONDERFUL Consortium during the meeting in CIIMAR.

More than **50 freshwater researchers and practitioners** from **11 countries** came together for the **first PONDERFUL consortium meeting from 5 to 7 April**. PONDERFUL partner CIIMAR (Interdisciplinary Centre of Marine and Environmental Research) hosted the event **in Porto**, welcoming

person and online.

Read more >>

Discover the importance of temporary ponds

Dr. Dani Boix (middle) during fieldwork with his team.

Dr. Dani Boix, researcher at the University of Girona, introduces temporary ponds in a short video and describes their relevance for biodiversity conservation and climate change adaptation.

Watch the video here

PONDERFUL researcher scoops national photographic prize for ‘alien’ image

Julie Fahy's winning image: Floating Saucer.

Congratulations to Julie Fahy, PhD student and assistant in the Aquatic Ecology group of the University of Applied Sciences and Arts of Western Switzerland in Geneva, for winning a prestigious **National Photographic Prize** for an image she captured while carrying out PONDERFUL fieldwork.

Julie's photograph, **Floating Saucer**, won the Locations and Instruments category at the Scientific Image Competition of the Swiss National Science Foundation.

Read more >>

Short TV documentary about PONDERFUL

Interview to Dr. Luc De Meester for Biosfera documentary.

Biosfera TV programme dedicated **a full episode to the PONDERFUL project**, in which they focused on the question: *Can ponds be an ally in the fight against climate change?*

Six PONDERFUL researchers were interviewed about their work on the project, covering their areas of expertise and their focus in PONDERFUL, including ecosystem services, carbon storage, policy and communicating with the public.

Read more >>

Watch the documentary here

The importance of being small: ponds feature at World Biodiversity Forum

WORLD BIODIVERSITY FORUM 2022

Delegates attending the World Biodiversity Forum heard about the critical role of ponds in conservation and the importance of small water bodies being reflected in policy. The hybrid event, held in the Swiss town of Davos, brought together a global consortium of researchers and

Jeremy Biggs, CEO of PONDERFUL partner Freshwater Habitats Trust in the UK, gave a presentation on the importance of small water bodies to freshwater conservation. Sharing the latest evidence, he discussed the issue of ponds and other small waters not being adequately recognised in conservation and water policy.

Read more >>

Survey: The role of ponds and pondscapes as nature nature-based solutions

The PONDERFUL project developed a questionnaire to **evaluate the role of these schemes as NbS for climate change adaptation, from the pond scale (local NbS) to the pondscape scale (landscape NbS)**.

If you have implemented a NbS in a pond or pondscape, for instance, pond/pondscape creation, restoration or management, we ask for your participation on filling this questionnaire.

Fill out the questionnaire

News and Events

International Association for Ecology (INTECOL) congress in Geneva

A team of PONDERFUL researchers from Spain, Sweden and Switzerland will discuss how ponds could help us to mitigate against and adapt to climate change at INTECOL2022. The international congress, which takes place in Geneva from 28 August to 2 September, is expected to draw a global scientific audience of around 3,000 people, joining in person and online.

PONDERFUL partners Beat Oertli, Malgorzata Blicharska, Aurélie Boissezon, Maria Cuenca Cambronero and Sandra Brucet will lead a session entitled '**Ponds and pondscapes as nature-based solutions for adaptation and mitigation to climate change and biodiversity conservation**.' The session will include 17 presentations, and will covering both PONDERFUL findings and as well as presentations from outside the project linking to the PONDERFUL project and related research in wetlands and pond ecology.

Read more >>

PONDERFUL publications

Do you want to know the latest publications of PONDERFUL? Check out the list below!

- Yilmaz *et al.* (2020) Decadal changes in size, salinity, waterbirds, and fish in lakes in the Konya Closed Basin, Turkey, associated with climate change and increasing water abstraction for agriculture.

- Cunillera-Montcusí *et al.* (2021) Metacommunity resilience against

ability determine landscape recover capacity).

- Parra et al. (2021) The future of temporary wetlands in drylands under the global change.

- Søndergaard et al. (2021) Submerged macrophytes in Danish lakes and their relationship with environmental factors.

- Cunillera-Montcusí *et al.* (2021) Recovery of temporary pond alpha and beta diversity after wildfire disturbance: the role of dispersal and recolonization processes.

- Walton et al. (2021) Improving the pollinator pantry: Restoration and management of farmland ponds enhances the complexity of plant-pollinator networks.

- Meerhoff & González-Sagrario (2021) Habitat complexity in shallow lakes and ponds: importance, threats, and potential for restoration.

- Meerhoff et al. (2022) Feedbacks between climate change and eutrophication: revisiting the allied attack concept and how to strike back.

- Cunillera-Montcusí *et al.* (2022) Freshwater salinisation: a research agenda for a saltier world.

- Strandberg et al. (2022) Combined effects of eutrophication and warming on polyunsaturated fatty acids in complex phytoplankton communities: A mesocosm experiment.

Freshwater reports

Here we review some recent research and policy events of interest to freshwater ecologists, which caught our eye and got us thinking – or suggested some practical actions we could take.

Ponds and other small waters

- The paper The disproportionately high value of small patches for

some amphibian studies). But it is an important general contribution to the argument that small habitats – like most freshwaters – are important.

- Taking a broadly North American view of the role of small waters the paper Vulnerable Waters are Essential to Watershed Resilience in the catchment is useful support for the importance of small waters in a different political/environmental context.

- A recent paper, Structural and functional development of twelve newly established floodplain pond mesocosms, describing the early post-creation stages of floodplain pond colonisation and development, will hopefully encourage more detailed investigation of floodplain pond functioning.

- Information on specific protected habitat types will be an important part of further refinement of protection measures so the paper, A review of dystrophic lake and pool habitat in Europe: An Irish perspective, discussing a common - but little appreciated - type of protected pond (and lake) type is valuable.

- Recent surveys of ponds and small lakes in the Alps have highlighted their value for Red-listed algae. In Diatom Red List Species Reveal High Conservation Value and Vulnerability of Mountain Lakes, the importance of a high-altitude ponds for algae is highlighted.

- Interesting nuances of pond function are revealed in A trophic cascade causes unexpected ecological interactions across the aquatic–terrestrial interface under extreme weather.

- More subtleties of fish effects on pond communities are shown in Community variability in pond metacommunities: interactive effects of predators and isolation on stochastic community assembly.

- One thing we are learning is that not all ponds are automatically good. In Small artificial impoundments have big implications for hydrology and freshwater biodiversity, the potentially damaging role of creating ponds on small streams is discussed.

- A similar cautionary perspective is provided in Australian farm dams are becoming less reliable water sources under climate change.

of farm dams, increases vegetation cover, water quality, and macroinvertebrate biodiversity so might reduce greenhouse gas risks.

- Data from Poland in The influence of land use in the catchment area of small waterbodies on the quality of water and plant species composition is useful additional ammunition in the battle for better buffers. This work suggests buffers to protect ponds should be 100 m wide!

Some other interesting papers

- Earlier this year an important Danish study Three decades of regulation of agricultural nitrogen losses: Experiences from the Danish Agricultural Monitoring Program reported on nitrogen pollution control measures in headwater streams in agricultural catchments.

- In Threats, challenges and sustainable conservation strategies for freshwater biodiversity, papers which will be well-known to the PONDERFUL team are revisited with the most interesting point from PONDERFUL's point of view being the need to include all freshwater (not just rivers and lakes).

- One important point that needs more emphasis is protecting what we already have so it is encouraging to see lake ecologists calling for more focus on this in Mustering the troops toward preventative management in lakes.

- New calls for measures to protect rivers continue to proliferate. One that caught our eye was Our failure to protect the stream and its valley: A call to back off from riparian development.

- Some useful lessons have already been learnt from a fish perspective as noted in Freshwater fish biodiversity restoration in floodplain rivers requires connectivity and habitat heterogeneity at multiple spatial scales. This study provides a large-scale evaluation of nursery area creation for riverine fishes on the lower river Rhine.

Read our full review >>

Stay tuned for more information on PONDERFUL

and follow us on social media:

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PONDERFUL News and Freshwater Reports

Issue No. 4

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.

Meet our team members

Professor Mariana Meerhoff - Professor of Aquatic Ecology, Ecology and Environment Management Department, University of Republic, Uruguay

Mariana Meerhoff working on the field.

I’m a limnologist: a freshwater ecologist interested in understanding the functioning of ecosystems and their responses to human activities. Ultimately, I aim to help find better ways to protect nature and to highlight the value of nature for us and for itself.

Over time, I have moved from studying purely aquatic phenomena to analysing watershed processes, and from focusing in natural ecosystems to social-ecological systems. I now mostly work on the impacts of global change in aquatic ecosystems, from streams to reservoirs, from shallow lakes to artificial ponds. As a scientist, I am particularly interested in the mechanisms that provide resilience to complex systems against stressors and perturbations. As an environmentally concerned citizen, I am also very interested in contributing to policy making and stakeholder involvement.

I lead most of the Uruguayan contributions to PONDERFUL. This involves coordinating a highly motivated, fantastic team of young researchers, who are carrying out their undergraduate theses, masters, PhDs and postdoctoral projects. The team focuses on different aspects of ponds, from GHG fluxes, nutrient dynamics, biodiversity patterns, trophic web structure and ecosystem stability to stakeholder perceptions and involvement.

Read more >>

Have a look at what we are doing

Opportunities for Pond Nature-Based Solutions in EU Policies

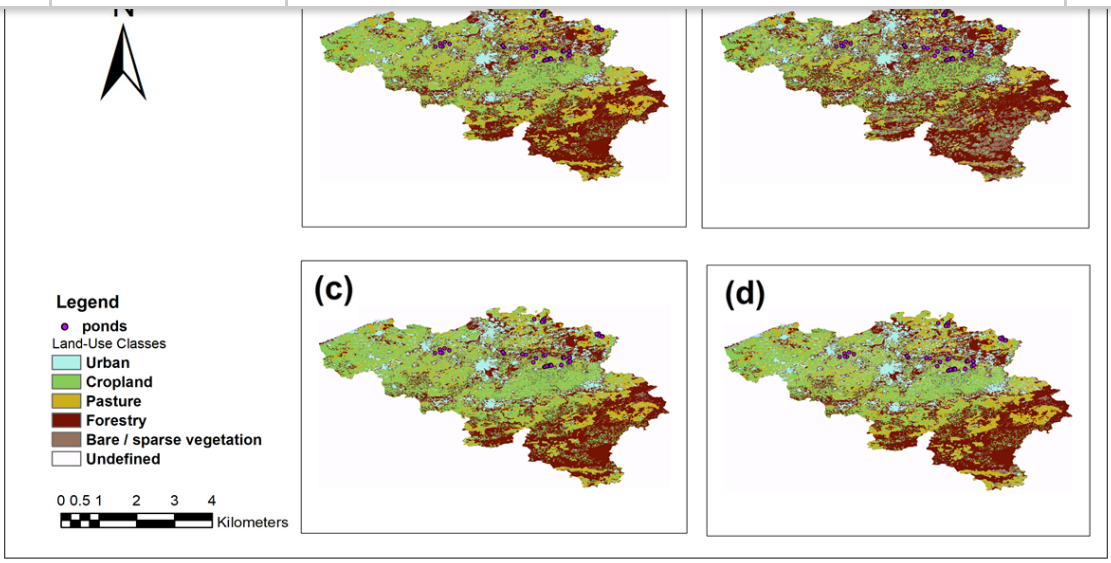
PONDERFUL Demo-site in Uruguay.

Nature-Based Solutions (NBS), as 'green infrastructure', are increasingly gaining traction in academia and policy-making as a way to reconcile the objectives of enhancing biodiversity and addressing challenges facing society, These challenges include climate change adaptation and mitigation as well as human wellbeing.

The European Commission considers NBS as key to "achieve more sustainable and resilient societies" and is working to position the European Union (EU) as a global leader in the development implementation of associated projects. However, while NBS are helpful as a common denominator to get people talking about biodiversity and climate-friendly infrastructure, the vagueness of the concept can obscure the fact that not all ecosystems benefit equally from NBS. Afforestation programmes or green roofs and walls, for example, are commonly implemented NBS. Meanwhile, other ecosystems continue to deteriorate in quality and diminish in quantity.

Read more >>

Downscaling global and local land use projections at fine spatial scale



Land use distribution in (a) 2020 and scenarios for 2050: (b) SSP1 RCP2.6, (c) SSP1 RCP6.0 and (d) SSP1 RCP8.5.

Land use change is one of the most important threats to biodiversity around the world. The effects of land use on biodiversity are most visible at local scales but are not adequately captured on the current global land use mapping. **Global land-use projections have a coarse spatial resolution, which means they do not capture small detail. Therefore, these estimates are unable to meet the needs of local research and decision-making**.

In PONDERFUL we were working on two protocols to update the GLOBIO land use allocation model to further **downscale land use projections at fine spatial resolution (100 and 10m)**.

Read more >>

Sharing early PONDERFUL research results at INTECOL 2022

Approximately 1,000 ecologists from around the world gathered (physically or virtually) at the International Congress of Ecology **(INTECOL)** **from 28 August to 2 September in Geneva, Switzerland**, to better understand how we can create a new paradigm to live in harmony with nature.

While ecology as a science will not

Image capturing in a pond with chambers.

ourselves it is evident that our society needs ecology to help us manage the biodiversity crisis and the ecosystem services that rely on it, in order to help us guide towards a more sustainable future.

Read more >>

Importance of ponds highlighted to Ramsar Convention of Wetlands

PONDERFUL partner Jeremy Biggs, of Freshwater Habitats Trust in the UK, gave a presentation on the importance of ponds in a **session entitled Unlocking the Potential of Wetlands for Addressing Climate Change and Biodiversity Loss.**

Professor Biggs gave international delegates an overview of the PONDERFUL project and shared some early results, particularly on the role of pods and Nature-Based Solutions for protecting freshwater biodiversity. He also highlighted the systematic bias against small waterbodies in policy, despite the fact that 90 percent of global standing waters are ponds of less than one hectare and most running waters are small or seasonal streams.

Read more >>

PONDERFUL at ISARA Open Day

The PONDERFUL project was present at ISARA **(Agronomy school in France, Lyon) Open Day** on 21 November! Companies related to farming, forestry, biodiversity and fish farming, as well as students, had the opportunity to watch our first video regarding the work of PONDERFUL on the balance between carbon storage and emissions in ponds.

Watch the video here

Survey: The role of ponds and pondscapes as Nature-Based Solutions

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Fill out the questionnaire

What PONDERFUL News

The PONDERFUL project is attracting attention from media around the world and, in recent months, our partners have made a number of appearances on TV and radio.

PONDERFUL collaborators at the University of Applied Sciences and Arts of Western Switzerland (HES-SO) interacted with journalists about their research on carbon sequestration and greenhouse gas emissions on ponds in Geneva. This resulted in the team, led by Professor Beat Oertli, appearing on Radio Télévision Suisse and RTS radio programme CQFD to share their early results. Their research, which they recently presented at INTECOL, was also covered in national newspapers.

In Uruguay, Professor Mariana Meerhoff of University of the Republic appeared on live TV discussing the complex and often controversial issues around artificial ponds, which have been created for agriculture or to provide cattle with water. In a studio interview with science programme SobreCiencia on TV Cuidad she shared how PONDERFUL is helping us to understand more about the relationship between biodiversity, the climate and these small waterbodies.

Read more >>

Freshwater reports

some practical actions we could take.

Ponds and other small waters

- A PNAS paper on amphibian recovery following 'massive pond creation' in Switzerland was the most striking recent research result linked to PONDERFUL arguments. Over 20 years, the creation of hundreds of ponds in the Swiss canton of Aargau led to increases in 10 out of 12 resident amphibian species - including threatened species.

- It's always useful to have more evidence of the value of ponds for biodiversity from different parts of the world. A recent paper from Bhutan has compared the richness of wetland plants in different waterbody types. The authors found that, although differences between waterbody types were not enormous, ponds were the richest habitats at regional level.

- A detailed review by a French team examines pesticide dissipation in artificial ponds and opens up the black box to look at the different processes involved. The complexity of processes operating at the same time to allow ponds to be effective in pesticide reduction hints at how difficult it would be to harness this process practically at a large scale.

- Meredith Holgerson and colleagues have resolved some of the classical assumption about mixing of waterbodies, often regarded as one of the trademark differences between ponds and lakes: Classifying mixing regimes in ponds and shallow lakes.

- The paper published earlier this year by Antonella Carosi and colleagues studies the ecology and habitat of the endemic fairy shrimp *Chirocephalus sibyllae* which is found in just one mountain temporary pond in Central Italy, emphasising its extreme vulnerability.

Some other interesting papers

- Further work by Lenore Fahrig and colleagues, this time on forests– the habitat that more than any that epitomises the belief that bigger is better – is very relevant to PONDERFUL. The team first reminds us that a large number of small forests typically support more biodiversity than a small number of large forests of them same area, implying that small patches are disproportionately valuable for biodiversity conservation.

The Ramsar Convention is **currently debating the adoption of a resolution on enhancing the conservation and management of small wetlands** which includes (but is not restricted to) alpine wetlands, ponds, karst wetlands, springs, and temporary/ephemeral streams. So amongst other things, **the resolution "Encourages Contracting Parties to consider** actively promote (note the weakening of the language here) **the conservation and management of small wetlands in policies, plans, programmes, and other policy instruments** via legislation, policies and plans, according to their own national conditions and as part of nature-based approaches to climate change adaptation and disaster risk management, among its other relevance to biodiversity conservation, and human health and well-being;"

Read our full review >>

Before you go, to make sure you have a PONDERFUL day watch this video recorded and edit by the PONDERFUL researcher Julie Fahy!

Watch the video here

Stay tuned for more information on PONDERFUL and follow us on social media:

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

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

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