



Ponderful

PONDS FOR CLIMATE

Policy briefing 2: Using ponds and pondsapes as nature-based solutions

The protection, management, restoration and creation of ponds and pondsapes presents many opportunities to mitigate and adapt to the impacts of climate change and benefit from the ecosystem services and Nature's Contributions to People that are provided by ponds.

Ponds and pondsapes can be used as nature-based solutions that provide a range of benefits for people and wildlife, including climate change adaptation and mitigation.

The European Commission (2021) identifies 12 societal challenge areas that can be addressed by nature-based solutions. The PONDERFUL project showed that ponds and pondsapes can address 11 of these societal challenges (Table 1). Success stories in the PONDERFUL technical handbook illustrate how pondsapes across Europe and in South America are providing these nature-based solutions.

WHAT IS A POND?

Ponds are small standing waters with a surface area from 1 m² to 5 ha that may be permanent or temporary, man-made or naturally created (Kelly-Quinn et al, 20171; Richardson et al, 2022).

This definition includes both semi-permanent and temporary ponds. In Europe, temporary ponds are common throughout the continent, in wet and dry climates, but are best known in drier Mediterranean regions. Temporary ponds usually dry up in summer whereas semi-permanent ponds dry up every five to 10 years. Both support specialised pond communities, including many rare and threatened species. This definition also include ponds with brackish waters. Ponds are usually shallow (up to 5 m deep) but occasionally deeper examples occur.



Because ponds deliver many benefits and are relatively easy to implement, they provide good value for money when seeking to address these societal challenges through nature-based solutions. In many situations, ponds and pondsape as nature-based solutions can effectively replace grey infrastructure, providing the same benefits, with a lower implementation cost.

How ponds can provide nature-based solutions to address societal challenges



1. REGULATION OF CLIMATE

Ponds are major sources and sinks of greenhouse gases and carbon. Their abundance and high biogeochemical activity means that they have a significant role to play in the management of the carbon cycle. PONDERFUL and other data show that we can reduce greenhouse gas emissions to the lowest level from ponds and pondsapes by ensuring that they are as free from pollution as possible.



2. REGULATION OF HAZARDS AND EXTREME EVENTS

Ponds have a long history of helping to regulate hazards from flooding but also protect against heatwaves by storing water in the landscape, ensuring that water is present for longer during increasingly frequent hot and dry weather. In addition, they can provide water for fire-fighting. Ponds and pondsapes can also help to cool landscapes, especially in urban areas.



3. REGULATION OF FRESHWATER QUANTITY

Ponds are widely used to 'clean up' polluted water running into other freshwater habitats. and pollution by holding back and cleaning up water as it flows through catchments.

In the PONDERFUL technical handbook we provide practical advice about the optimum way of ensuring that, as this clean up service is provided, it does not impair the underlying biological contribution that must be made by nature-based solutions. Creating new clean water ponds, protected from pollutant sources, in low intensity landscapes is a quick and easy way of bringing more clean water in the network of freshwater habitats. New evidence from the PONDERFUL projects suggests easy ways to achieve this through a combination of pond management, restoration and creation.



4. FOOD AND FEED

Some ponds and pondsapes support the production of food or feed, for example, providing drinking water for livestock or fish for people to eat.



5. POLLINATION

Ponds support populations of many groups of organisms that help pollinate crops. We are just starting to understand the magnitude of the contribution made by freshwaters, including ponds, to pollination. However, it is clear that managing or restoring overgrown and neglected ponds can cause substantial increases in numbers of pollinators.



6. PHYSICAL AND PSYCHOLOGICAL EXPERIENCES

7. LEARNING AND INSPIRATION

8. SUPPORTING IDENTITIES

Ponds are well-known for their ability to provide learning, inspiration, health and wellbeing. The techniques for pond management, restoration and creation that we summarise in the PONDERFUL technical handbook can all be used to maintain or create ponds and pondsapes which allow people to benefit from these Nature's Contributions to People. Climate change is likely to increase this demand, with swimming ponds providing an important refuge for people living with a hotter climate.



9. HABITAT CREATION AND MAINTENANCE

Central to the value of ponds is their importance as habitats, and for maintaining freshwater biodiversity. We summarise the key practical measures needed to protect, manage, restore and create ponds and pondsapes to maximise the habitat creation and maintenance benefits they provide.



10. MAINTENANCE OF OPTIONS

Ponds play an important role in maintaining the capacity of freshwater ecosystems, habitats, species, or genotypes to keep options open to support a good quality of life. "Biodiversity," interpreted as living variation, is an important aspect of "maintenance of options."