FEDERATION OF EUROPEAN
AQUACULTURE PRODUCERS

Statement
On the Ecosystem Values of Freshwater Fishponds in a Changing Climate

9 September 2026

Fishponds as heritage wetland landscapes

Freshwater fishponds are not only production systems. This statement concerns traditional extensive and semi-intensive freshwater pond systems, based predominantly on common carp polyculture. Across Europe, and particularly in Central and Eastern Europe, traditional pond aquaculture has shaped human-made wetland landscapes for centuries. These landscapes are part of Europe's rural heritage and traditional food culture, while natural processes and human management work alongside each other to sustain both fish production and wetland functions. Fishpond production technology maintains approximately 250,000 hectares of nature-like wetlands in the European Union making it a significant component of Europe's managed wetland infrastructure [1].

A multifunctional response to climate change

In the context of climate change, increasing drought frequency, water scarcity, biodiversity loss and rural vulnerability, freshwater fishponds should be recognised as multifunctional systems that combine local food production with nature conservation, climate change mitigation and adaptation. Their importance has increased as water regulation, wetland maintenance and landscape resilience have become more urgent European priorities.

Traditional pond production systems

Traditional carp ponds are almost exclusively extensive or semi-intensive systems with seasonal and comparatively low-input production. They mainly produce low-trophic freshwater fish and can operate with little or no dependence on fishmeal. Their relatively low operating intensity and integration with natural productivity can also contribute to the economic resilience of rural aquaculture enterprises [1].

Ecosystem functioning and the need for active management

Fishponds function as open ecological systems in which production technology and natural processes are closely interconnected. Appropriate pond management creates a characteristic "fishpond ecosystem" that resembles semi-static natural wetlands in its nutrient cycling and habitat structure. These ecological values depend on continued active management [3]. Experience from abandoned or decommissioned pond farms shows that simply ending fish production does not necessarily restore a more natural or biodiverse habitat: without water-level control, vegetation management, maintenance and periodic disturbance, open-water and wetland mosaics disappear and ecological

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value declines. A study from Germany showed that unmanaged ponds had the lowest number of wild fish species [2].

Water storage and regulation

Freshwater ponds used for aquaculture store and regulate water at landscape scale. They contribute to water accumulation and retention, drought mitigation, buffering of precipitation events, the reduction of flood peaks and, in some regions, coastal protection. Stored surface water may also support irrigation and other local needs, while pond systems can contribute to groundwater recharge and stabilise local groundwater conditions. This function is particularly important in lowland agricultural landscapes and drought-prone regions, where seasonal water deficits, heatwaves and rapid fluctuations in water availability are becoming more frequent [4][5].

Local climate regulation

These ponds also help regulate local climate. Open water surfaces, wetland vegetation, reedbeds and surrounding habitats influence temperature, humidity and evapotranspiration. In this way, pond and wetland aquaculture can provide micro- and meso-climatic buffering effects, helping to moderate heat extremes and support the resilience of surrounding landscapes [4].

Biodiversity value

The special ecological significance of pond systems largely stems from their long-term continuity. Many pond landscapes have developed over centuries and now offer a mosaic of diverse habitats, including water bodies, shallow-water zones, reed beds, wet meadows, and woody structures. Traditional pond aquaculture is closely linked to biodiversity. Many fishponds function as semi-natural wetlands, providing habitats for many migratory and protected species. Aquatic plants, amphibians, reptiles, invertebrates, fish, mammals and more than 400 bird species are connected to these habitats and conditions, which persist only because the ponds continue to be managed. Many ponds and pond landscapes are therefore essential elements of the Natura 2000 network, demonstrating the role of fishponds as regional biodiversity hotspots [1].

Nutrient cycling and water quality

Freshwater fishponds contribute to nutrient retention, cycling and water-quality regulation. Through biological production, sedimentation, and wetland processes, ponds act as natural bioreactors, retaining and/or breaking down nutrients, organic matter, and certain organic micropollutants, filtering and purifying water, and reducing nutrient emissions to surrounding water bodies. Over decades, sediment accumulates on pond bottoms, while nutrients are continuously exported from the system through harvested fish. Its periodic removal can restore water depth and storage capacity, improve production security and drought resilience, and, where the sediment is nutrient-rich, provide valuable organic material for depleted agricultural soils. This process effectively closes the material and nutrient cycle in the landscape under the principle of circular economy and can reduce the need to apply artificial mineral fertilisers. However, desilting is extremely costly and is generally not adequately supported by existing financial instruments, including the EMFAF [6][7].

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Ecosystem services under the CICES classification

Under the Common International Classification of Ecosystem Services, fishponds provide not only farmed fish but also other provisioning services, including wild aquatic organisms, reed and plant biomass and stored water. Their regulating and maintenance services include water storage and retention, groundwater recharge, flood buffering, nutrient retention, water purification, carbon storage in biomass and sediments, habitat maintenance and local climate regulation [6][4].

Food production

Pond aquaculture also produces food. Common carp and associated pond species (European catfish, pikeperch, pike and other cyprinids) remain important regional aquaculture products and form part of the culinary and religious traditions of several Central and Eastern European countries. A recent production dataset for major European carp-producing countries recorded 54,793 tons of carp species in 2023, including 51,784 tons of common carp [8]. These figures show that traditional ponds remain relevant not only as environmental infrastructure, but also as a source of locally produced, low-trophic freshwater fish.

Cultural and socio-economic value

The cultural and socio-economic value of pond aquaculture must also be recognised. Fishponds are part of Europe's rural heritage, landscape identity and traditional food culture. Historical pond systems have shaped many landscapes for centuries and represent a significant part of cultural heritage. They document traditional forms of land use and are closely linked to regional economic and cultural histories. They support employment and generational renewal in rural areas, provide healthy locally produced fish, create opportunities for angling, tourism, entrepreneurship, environmental education and research, and preserve knowledge developed over centuries of pond management [9].

FEAP's policy recommendations

FEAP therefore calls for freshwater fishponds to be fully recognised in European and national policies as multifunctional aquaculture systems that provide public and ecological ecosystem services in addition to food production. Their role should be reflected in the EU Biodiversity Strategy and climate objectives, climate adaptation strategies, biodiversity and wetland conservation policies, water-management and spatial-planning frameworks, rural development measures and aquaculture support instruments.

FEAP supports:

1. recognition of the complex environmental and societal benefits of pond aquaculture in the implementation of the EU Biodiversity Strategy and EU climate objectives;
2. recognition of freshwater fishponds as traditional farming areas of high ecological value and of traditional pond aquaculture as a nature-based solution for water and nutrient retention, biodiversity maintenance and climate change mitigation and adaptation;
3. integration of fishpond systems into drought resilience, wetland restoration, river-basin management and catchment-level water-management policies;

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4. coordinated spatial planning for freshwater pond habitats and secure allocation of space for pond aquaculture that provides ecosystem services;
5. simplified, proportionate and predictable administrative procedures for access to space, licensing and operation, supporting the long-term continuity of pond aquaculture as a key contributor to local food sovereignty;
6. targeted public compensation and investment support for the maintenance of ecosystem services provided by well-managed pond farms, including the removal and beneficial agricultural use of accumulated pond sediment where this restores production capacity, water storage volume and climate resilience;
7. improved scientific monitoring, evaluation and valuation of pond-related ecosystem services, including water storage and retention, biodiversity, nutrient cycling, water purification, carbon balance, local climate regulation and cultural values;
8. closer cooperation between aquaculture producers, environmental authorities, scientists, water managers and rural communities; and
9. educational and communication programs to improve public and policy understanding of the ecological, economic and social values of freshwater pond aquaculture.

Conclusion

Freshwater fishponds fulfil important functions in the water cycle and in regulating environmental processes, representing a rare example of productive landscapes that can combine food production with wetland conservation, water storage and retention, climate resilience, and rural development opportunities. Their ecological functions are not incidental to farming but are often created and maintained by it. Preserving economically viable pond farming operations is therefore an essential prerequisite for the continued existence of these ecological and societal benefits that have developed over the long term. With Europe facing more frequent droughts, biodiversity decline and increasing pressure on water resources, maintaining, managing and restoring the capacity of these systems is not only an aquaculture priority but also a wider environmental and societal necessity.

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