V4 FRESHWATER AQUACULTURE CONFERENCE
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Specificities of pond fish farming

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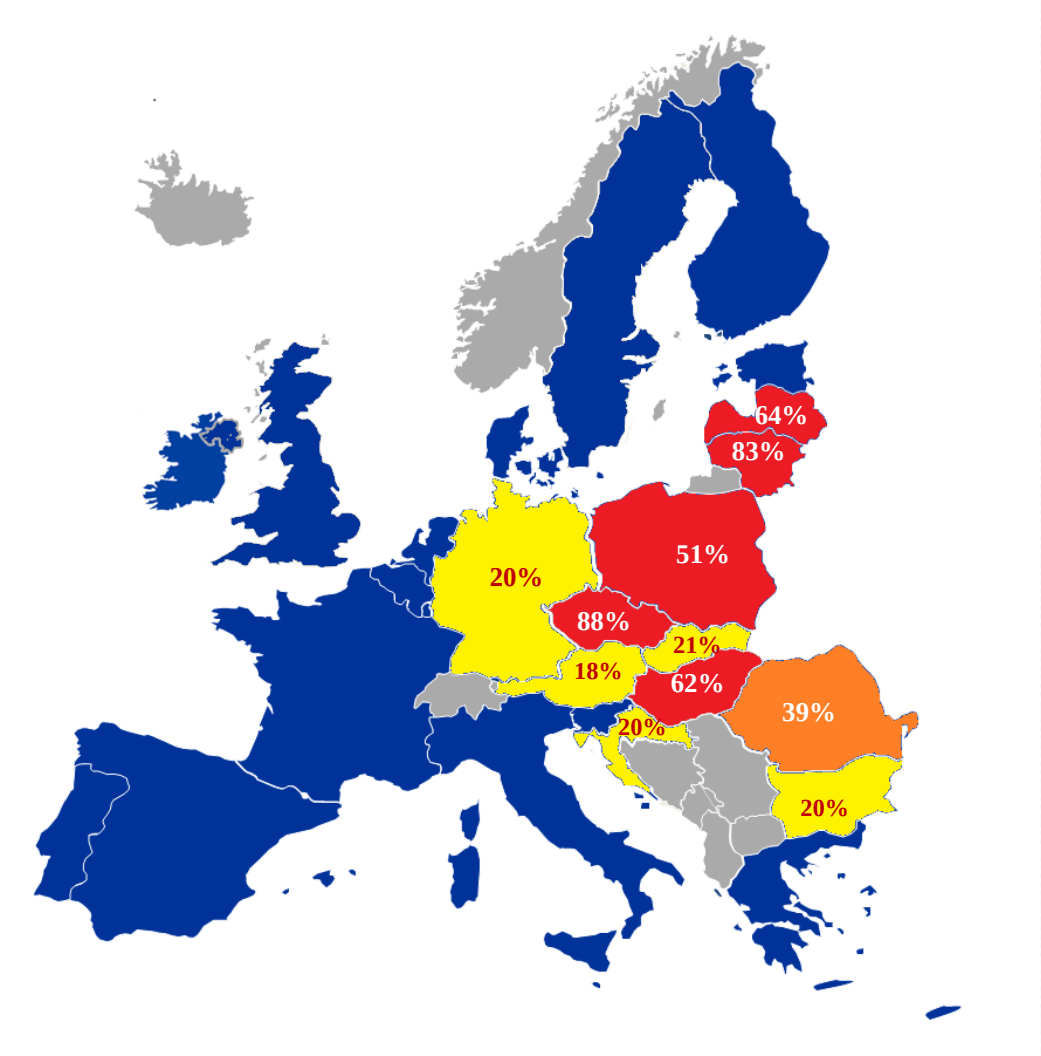
Pond aquaculture in EU countries



Basic figures:

- ~ 350 000 ha fish pond area in EU
- Total production: 71 210 t (2015)
- Carp is 4th after trout, salmon and seabream in terms of volume
- Stabil but stagnating production
- ~ 8000 employees (production)

Percentage shows the share of common carp in total aquaculture production

Source: FAO Fishstat Plus, 2015

Terms and definitions 1.

STATISTICAL APPROACH

- **Inland fisheries:** any activity conducted to extract fish and other aquatic organisms from inland waters (FAO 1997a).

- **Aquaculture:** the farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants (FAO 1997b).

Terms and definitions 2.

ECOLOGICAL APPROACH

- **Inland fisheries:** such utilization of surface waters where the system's operation is entirely based on natural processes, catches are limited on the part of the fish that growing on the natural food base.
- **Intensive aquaculture:** such industrial production where both input and output are fully controlled, and natural processes do not significantly affect production.
- **Pond aquaculture:** is based on the material flow processes typical of natural wetlands, artificial interventions only contribute these processes to increase production. Fishponds operate as an open ecological system where natural and technological processes are built on one another and are implemented in a non-separable way (Halasi-Kovács 2012).

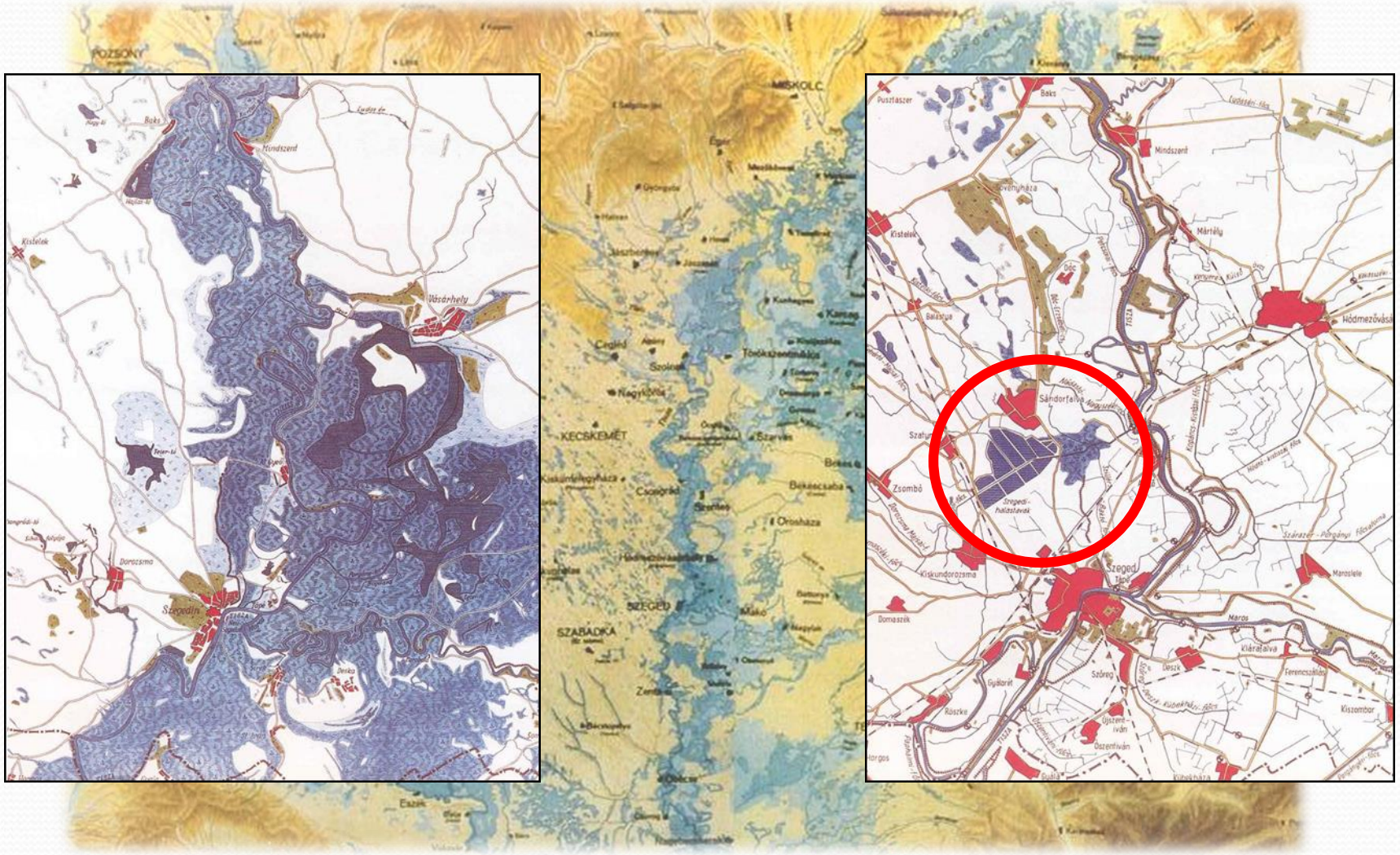
The special fish pond ecosystem

Natural wetland

Fish pond

- Fishponds has artificial origin. The water supply is also artificial (by gravity, or by pump) in decisive part.
- Comparable nutrient cycling processes.
- Artificially high nutrient level that will be removed by the harvested fish.
- It results steady state, and high biomass in every level of food chain all over the vegetation period.
- Planktonic predominance that maintained by the carp stock.
- Typical mosaic-complex that develops by the results of periodic water filling and drainage.

Pond aquaculture maintains 350.000 ha natural-like wetlands in EU



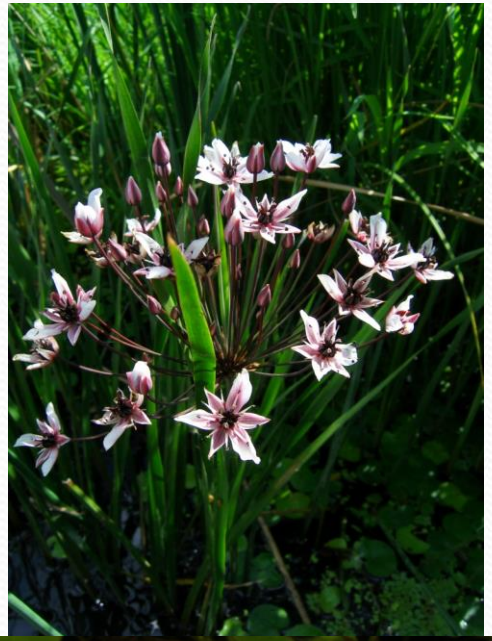
Pond fish farms contribute to preserve biodiversity: bird populations that connected waters

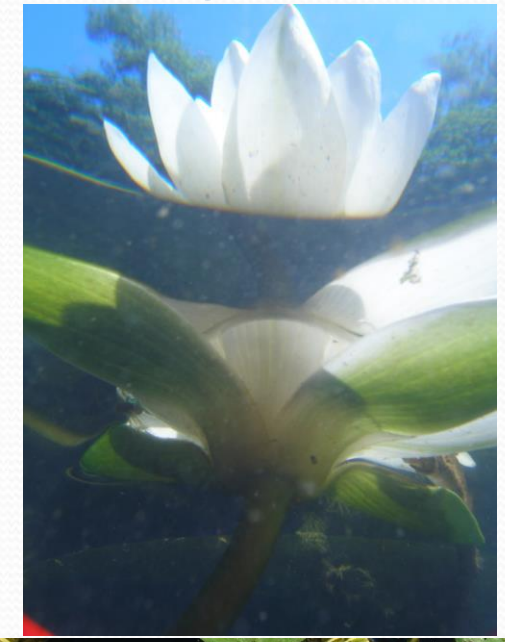
- More than 300 species in the 6.000 ha area of Hortobágy Fishfarm Co. (Halasi-Kovács 2008)

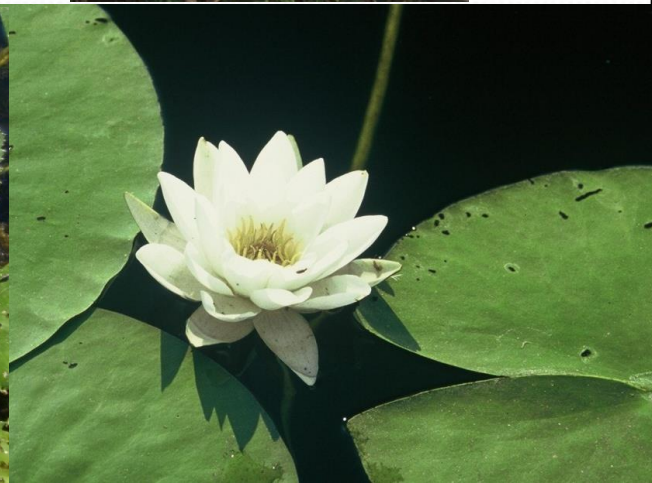





Pond fish farms contribute to preserve biodiversity: vegetation







Pond fish farms contribute to preserve biodiversity: other animal species valuable from nature conservational aspect






Pond fish farms contribute to better water management

- Retention of water (the amount of water used for pond aquaculture in Hungary cca. 300 million m^3)
- Retention of soluble and floating compartments in supply water.

1 ha pond in one year retains:

3.8 – 8.4 kg	**Phosporous**
96 – 560 kg	**Nitrogen**
1100 – 1600 kg	**Suspended Solids**

(Knösche et al. 2000)

Value of production and ecological service function of an extensive fishpond

- Research cooperation between „fish pond countries" has been initiated to verify data

Value of fish production:
4.830 €/ha/year

Value of ecosystem services:
52.857 €/ha/year

Source: Turkowski & Lirski, 2011

Pond fish farms contributes to achieve the goals of NATURA 2000 and WFD

NATURA 2000	NATURA 2000 is the centrepiece of EU nature & biodiversity policy. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. It is an EUwide network of nature protection areas established under the 1992 Habitats Directive. Under the 1979 Bird Directive.	NON PRODUCTION FUNCTION OF FISH PONDS: • Providing important habitats for flora and fauna; • Maintanence of Biodiversity;
WATER FRAMEWORK DIRECTIVE	The WATER FRAMEWORK DIRECTIVE establishes a legal framework to protect and restore clean water across Europe and ensure its long-term sustainable use. Its official title is Directive 2000/60/EC of the European Parliament and the Council.	• Improve water management; • Receive flood waters and sustain water in the landscape.

Pond aquaculture needs new technologies and support

- The pond aquaculture means an extensive technology.
- The additional costs of maintaining natural value with the current operating intensity is not sustainable economically.

Sustainable intensification is required! Need to find market for freshwater fishes

The additional costs of natural value maintenance requires support!

The innovation also needs support

Main conclusions

- Freshwater pond fish farming is a unique segment of European aquaculture.
- Pond aquaculture is a good example for natural resources renewing technology and the circular economy.
- Pond fish farms besides producing fish provide ecosystem services and contribute to achieve the goals of NATURA 2000 and WFD.
- Pond aquaculture requires sustainable intensification and support for maintaining the additional costs of natural values that resulted by operation.
- The role of fish ponds in environment protection and water management should be better acknowledged and supported.


Thank you for your attention!
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