

European pond aquaculture – providing low footprint, healthy food products and society-wide services

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Conference on positive benefits of the EU AQUACULTURE to European society

EU pond aquaculture (CZE, POL, HUN, GER, ROM, CRO, FRA, AT, SK, BG, Baltic r.)

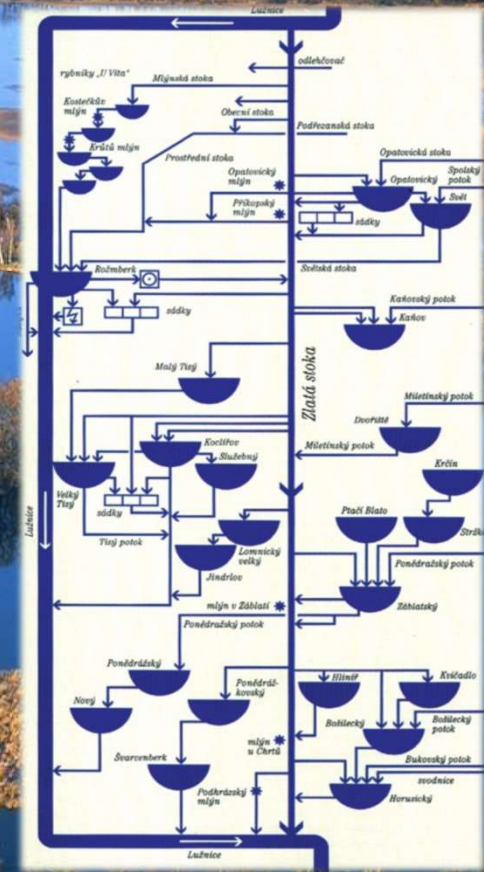
POND = man-made, shallow, nature-close historical waterbodies (NOT A LAKE OR CONCRETE RESERVOIR!)

Production function of ponds - Aquaculture: ~ 20-22,000 tons fish (CZ)

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- ▶ **POND aquaculture**
~ 95 % of production
 - ▶ **special systems** (RAS, raceways)
~ 5 % of production

85 % of production = common carp (18,000 t)

main pond systems (up to 300-500 ponds > 1 ha in a system)

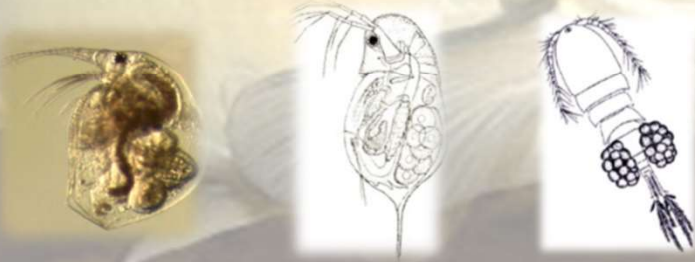


Carp production in ponds - marketable size 1.5 - 3 kg (3 - 4 year-old fish)

Efficient utilization both of natural food resources (sometimes supported by manuring) NO FISH OIL/FISH MEAL

and artificial local feeds (cereals) supply = omnivorous species, low position in a food chain

= lowest carbon (environmental) footprint - animal proteins production
= no/very rare use of medical treatments



= ideal candidate predetermined for organic aquaculture and switch from conventional to organic farming EASY, BUT...!!!

Organic pond aquaculture, organic carp product

Total carp production in EU (85,000 tons), organic carp production (3,562 tons, 4 % and still decreasing) source EUMOFA

Czech Rep. + Poland = 40,000 tons, organic carp production (1 + 282 tons, < 1 %) source EUMOFA

Where are the barriers? EU legislation (Reg. (EU) 2018/848), appl. 2022?

- ✓ Certified feeds without fish meal and fish oil
- ✓ Avoidance of chemical treatments and inorganic fertilizers
- ✓ Organic fertilization only max. 20 kg.ha⁻¹ N
- ✓ Avoidance of allopathic medicaments (max. twice per year)
- ✗ > 20 tons production = EIA
- ✗ No more possible use of juvenile fish from conventional farming (2/3 of life in organic farm) » own hatchery
- ✗ No hormonal treatment in reproduction

Organic pond aquaculture, organic carp product

- Natural small ponds spawning = low efficiency, unfeasible for professionals
- Hormonally driven reproduction + driven temperature = synchronisation of females ovulation/male sperm production
- **Natural hormone** – gonadotropin (extraction of pituitary gland (dried) + sodium chloride (NaCl) solution
- **Synthetic hormones** (e.g. Ovopel, Dagin) – more efficient (fertilized eggs, female fecundity)



Technical obstacles specific for organic (carp) farming

- ✗ Organic farming – higher expenditure (certified food + juveniles, process of certification, other costs) of min. 20-30 %
- ✗ Market driven demand (low interest) = consumer's perception of carp as a cheap fish (~ 3-4 EUR/kg), organic ~ 6-7 EUR/kg (uncertain investment return)
- ✗ Predation by protected overpopulated animals (cormorant, otter, herons)
- ✗ Permanent and reliable supplier of organic feeds and juveniles (if any around)
- ✗ **Organic (bio) carp x conventional (ecological) carp (practically no difference in rearing, the same quality product, customers choice)**



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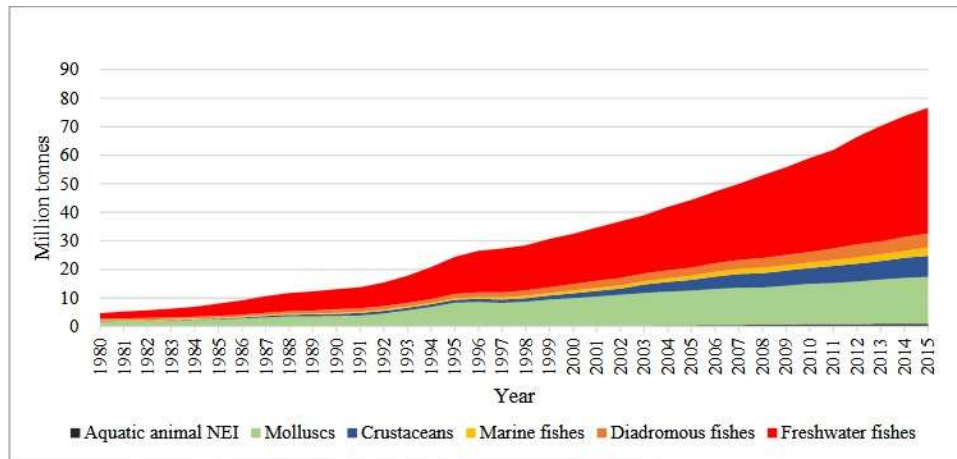
Aquaculture

Aquaculture is the farming of aquatic organisms in both coastal and inland areas involving interventions in the rearing process to enhance production.

It is probably the fastest growing food-producing sector and now accounts for 50 percent of the world's fish that is used for food.



Aquaculture in the WORLD



Source: FAO Fisheries and Aquaculture Database – FishStatJ (FAO, 2017g).

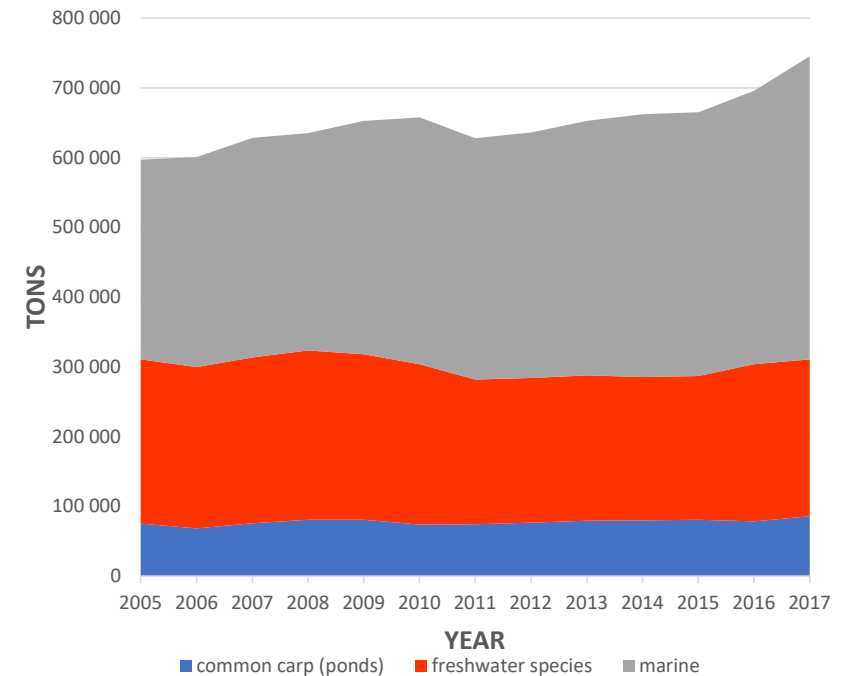
Global Aquaculture Production for species (tonnes)

Source: FAO FishStat



Source: FAO FishStat

Aquaculture in the EU



Source: EUMOFA sourced by EUROSTAT

BOTTLENECKS?

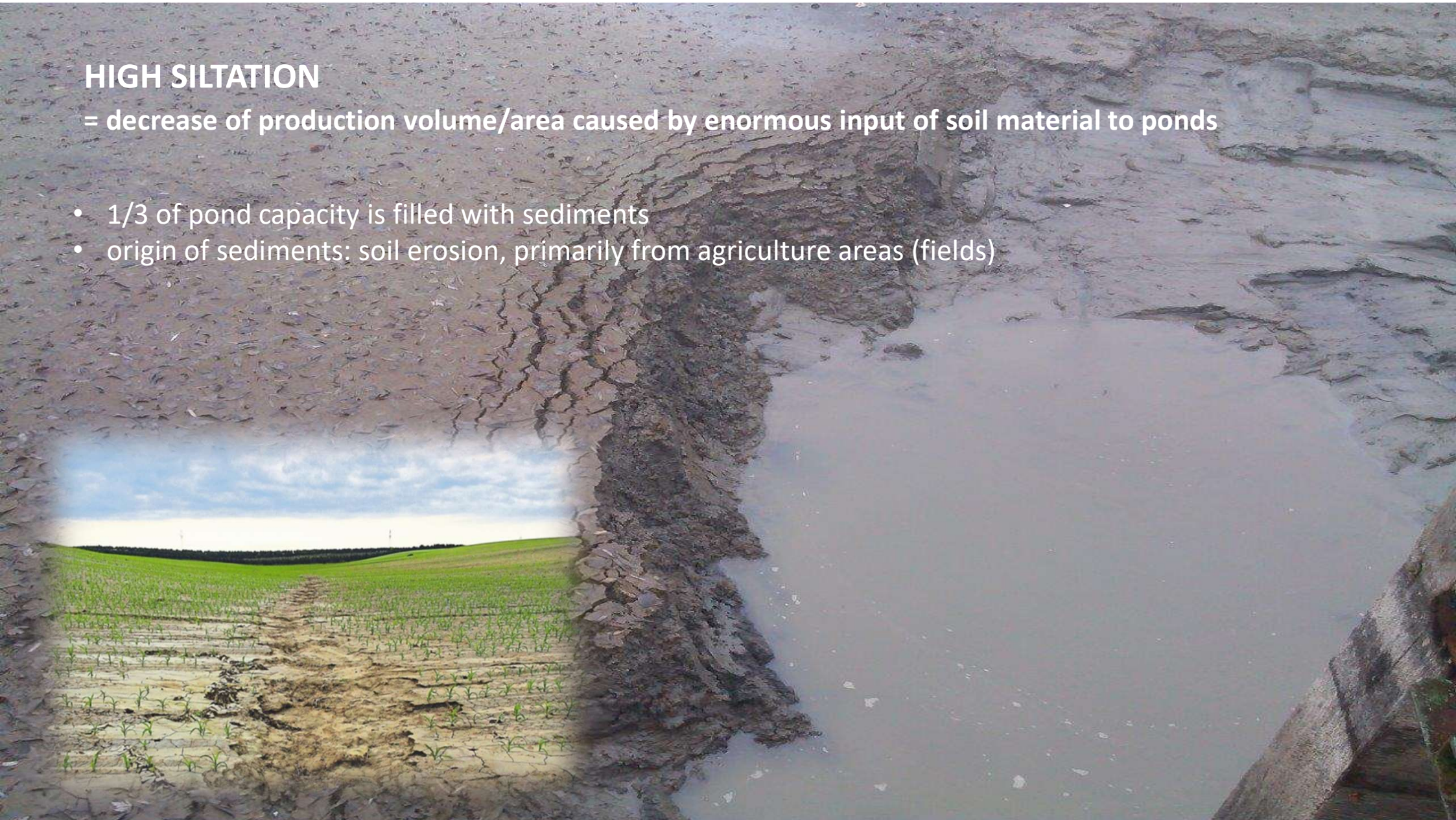
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- *POND = „significant landscape element“ (according to Czech legislation)*
 - *NATURA 2000 network:* - *Special protection areas (bird areas)*
- *Special areas of conservation (habitats, species)*

NATURE PROTECTION restrictions (low fish stocking, no/limited fish feeding, restricted water manipulation, vegetation maintenance)

HIGH SILTATION

= decrease of production volume/area caused by enormous input of soil material to ponds

- 1/3 of pond capacity is filled with sediments
- origin of sediments: soil erosion, primarily from agriculture areas (fields)



CLIMATE CHANGE

DROUGHT (water deficiency + evaporation, temperature not a problem for carp breeding – temperature optimum)

LOCAL SPATES, FLOODS (intense rainfall, higher input of sediments, more harmful/toxic substances, safety of waterbodies)



EU PROTECTION of overpopulated species

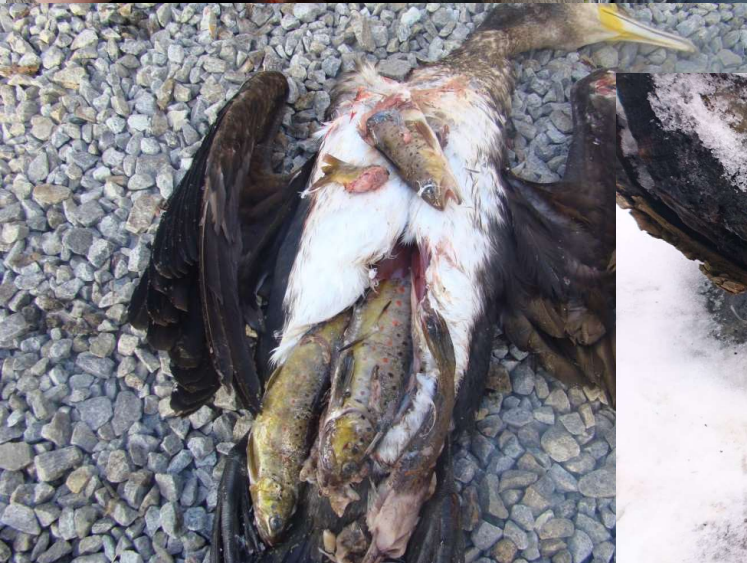
great cormorant (*Phalacrocorax carbo sinensis*), European otter (*Lutra lutra*), heron species (*Ardea* sp.) and others

pan-European (40-50 years) problem – today: 2 mil. birds; 1,000 tons of fish /day in Europe + other secondary losses

- definition of invasive species (economic, biodiversity), but still protected
- for shooting or scaring - derogation needed (Art. 9 BD), administrative burdens (local/regional authorities)
- Regional area-wide derogation in CZ (5 years)

FEAP resolution (2019) – call for cormorant to be a huntable species (Annex II, The birds directive 2009/147/EC)







Non-productive pond functions (ponds providing society-wide ecosystem services)

- **Water accumulation, impact on microclimate**
accumulation and retention of surface water (groundwater), water storage in landscape
- Flood protection (retardation, reduce culmination in time)
- **Secondary wastewater treatment**
improvement of water quality passing through a pond – nutrient retention, transformation or elimination (particularly P, N), bioreactors (degradation of pollutants, medicaments)
- **Energetic utilization** – small hydroelectric power stations (renewable energy source)
- **Ecological functions** – unique ecosystems with high biodiversity of fauna and flora
- **Socio-economic development** of rural areas (employment, tourism, etc.)

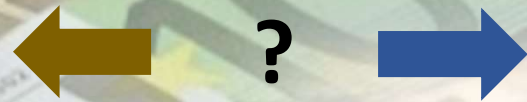
EU FOOD PROVIDING AND LANDSCAPE MAINTAINING SECTORS

AGRICULTURE – under COMMON AGRICULTURAL POLICY

AQUACULTURE – under COMMON FISHERIES POLICY

Support of LIVESTOCK and CROP FARMING

Support of FISHERIES and AQUACULTURE



POND FISH FARMING

„Crop farming“ (fields)

„Carp farming“ (pond fields)

SAPS

**ECOSYSTEM
SERVICES???**



SUMMARY – adopted measures making EU pond aquaculture more sustainable, resilient and competitive

Reduction of losses caused by protected predators (damage compensation for pond farmers in EU, decrease of protection status within EU – cormorant as a huntable species)

Certification of organic carp is mostly non-profitable and unfeasible on a large scale (only as a value added pond farming diversification – recreational purposes, local market) and certainly needs some legislation revision (e.g. use of natural hormones, juveniles issue)

... further help from EU and national governments is essential – reward mechanism for providing ecosystem services and landscape maintenance (single area payment) and EU approved labelling (or certification) of natural pond-related, low footprint and „Green deal friendly“ products

