

The importance of good ecological status for the successful revival of the Danube sturgeons

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Sturgeon 2020 – a success story of EUSDR

EUSDR – integrative approach reuniting all sectorial policies



EUSDR PA 6 and PA 4 target: “to ensure the revival of Danube sturgeons and other indigenous fish species by 2020”

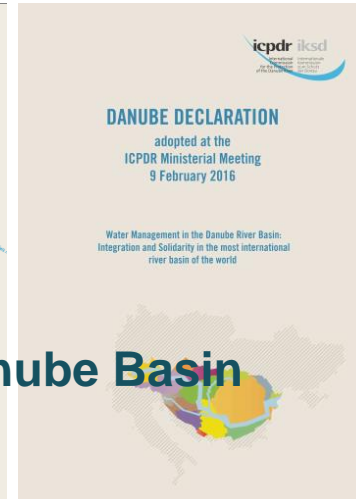
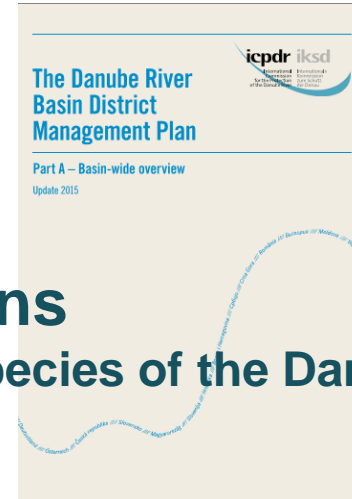
International political support

EUSDR



Interlinkage needed with all
EUSDR Priority Areas

ICPDR



Sturgeons
flagship species of the Danube Basin



ICPDR Ministerial meeting - 9 Feb.2016

Integrative approach

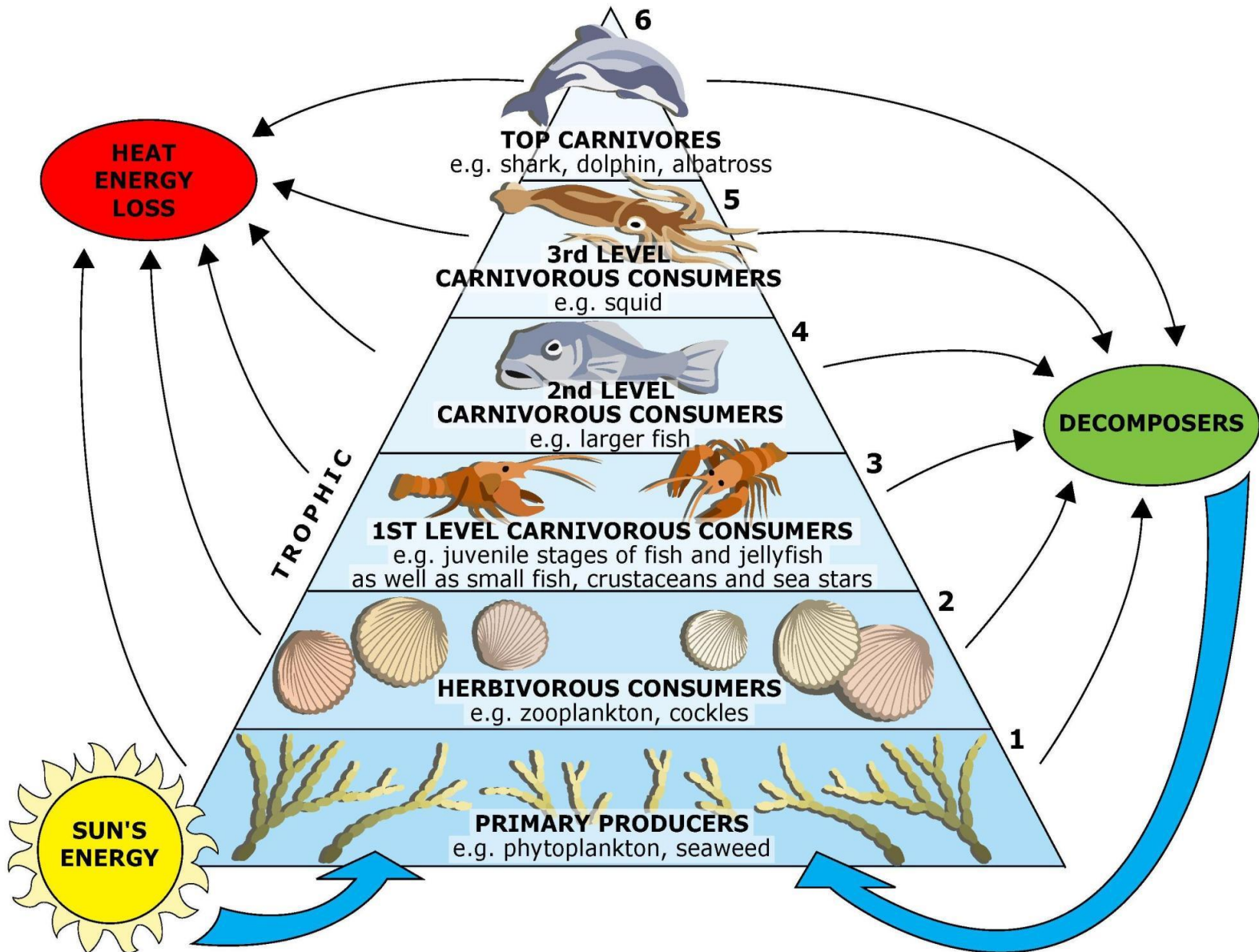


Key topic 3. In situ conservation

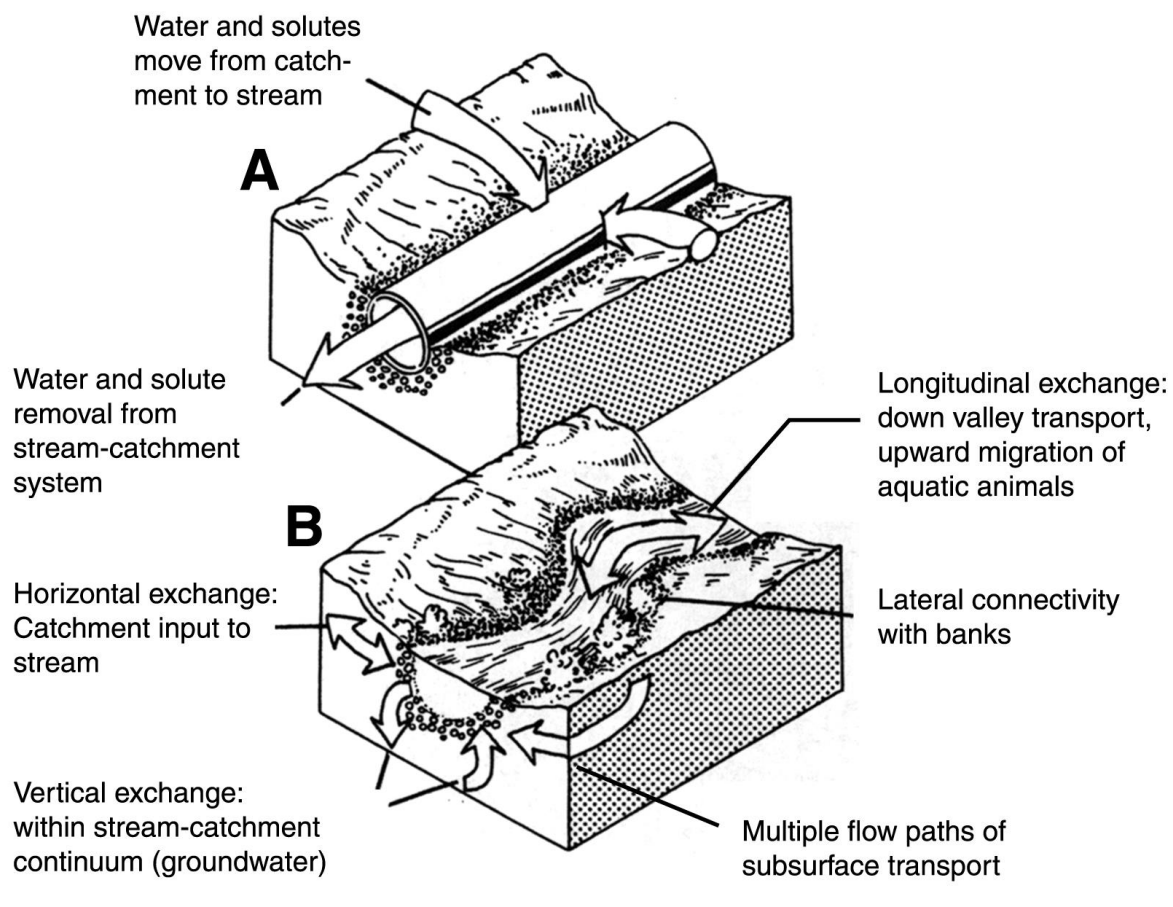
Good ecological status - defined in Annex V of the WFD:

- 1. Quality of the biological communities:** Aquatic flora
Benthic invertebrates
Fish community
- 2. Hydromorphological characteristics:**
 - Hydrological regime
 - Quantity and dynamics of water flow
 - Connection to groundwater bodies
 - River continuity
 - Morphological conditions
 - River depth and width variation
 - Structure and substrate of the river bed
 - Structure of the riparian zone
- 3. Chemical characteristics** General: temperature, pH, oxygen, salinity
Nutrients
Specific pollutants
Priority substances discharged into the WB
Other substances discharged in significant quantities into the WB

1. Biological communities – interlinked in food webs



2. Hydromorphological alterations



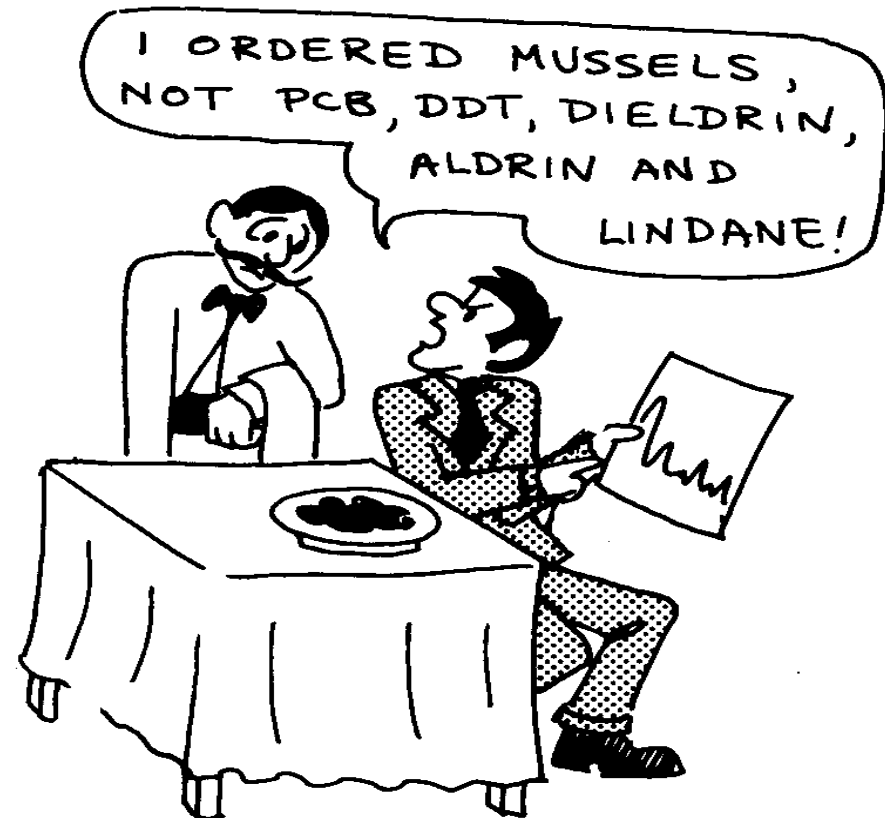
- Affect connectivity
- Change hydrology (discharge, flow)
- Habitat fragmentation
- Loss of floodplains/wetlands
- Change sediment flux

Source: *Bencala, 1993*

3. Water chemistry

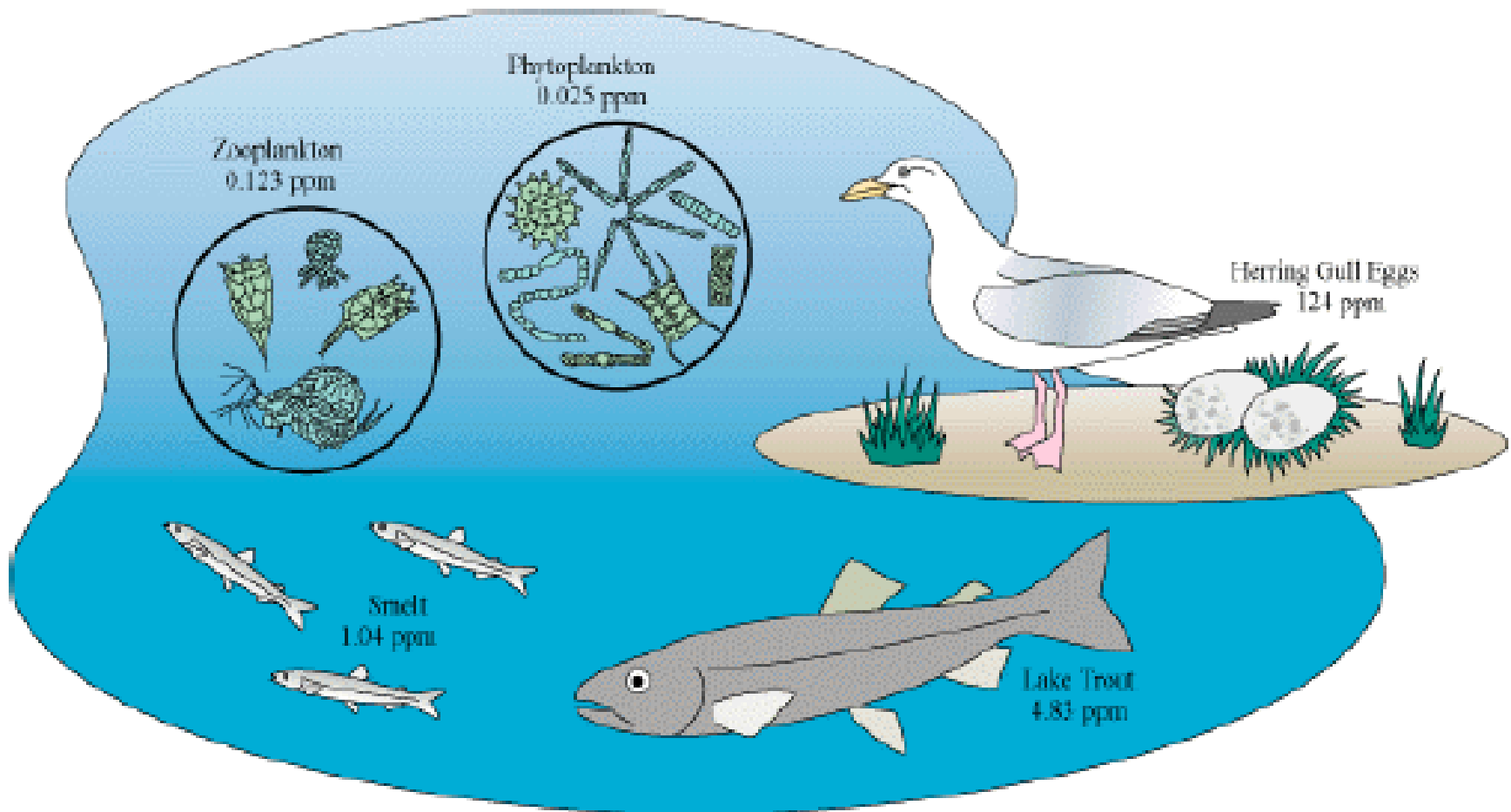
Pollution impact on aquatic ecosystems

- Excess nutrients (nitrogen and phosphorus) → eutrophication
- Toxic substances (heavy metals, emergent pollutants)
- Bioaccumulation
- Biomagnification
- Lethal and sub-lethal effect



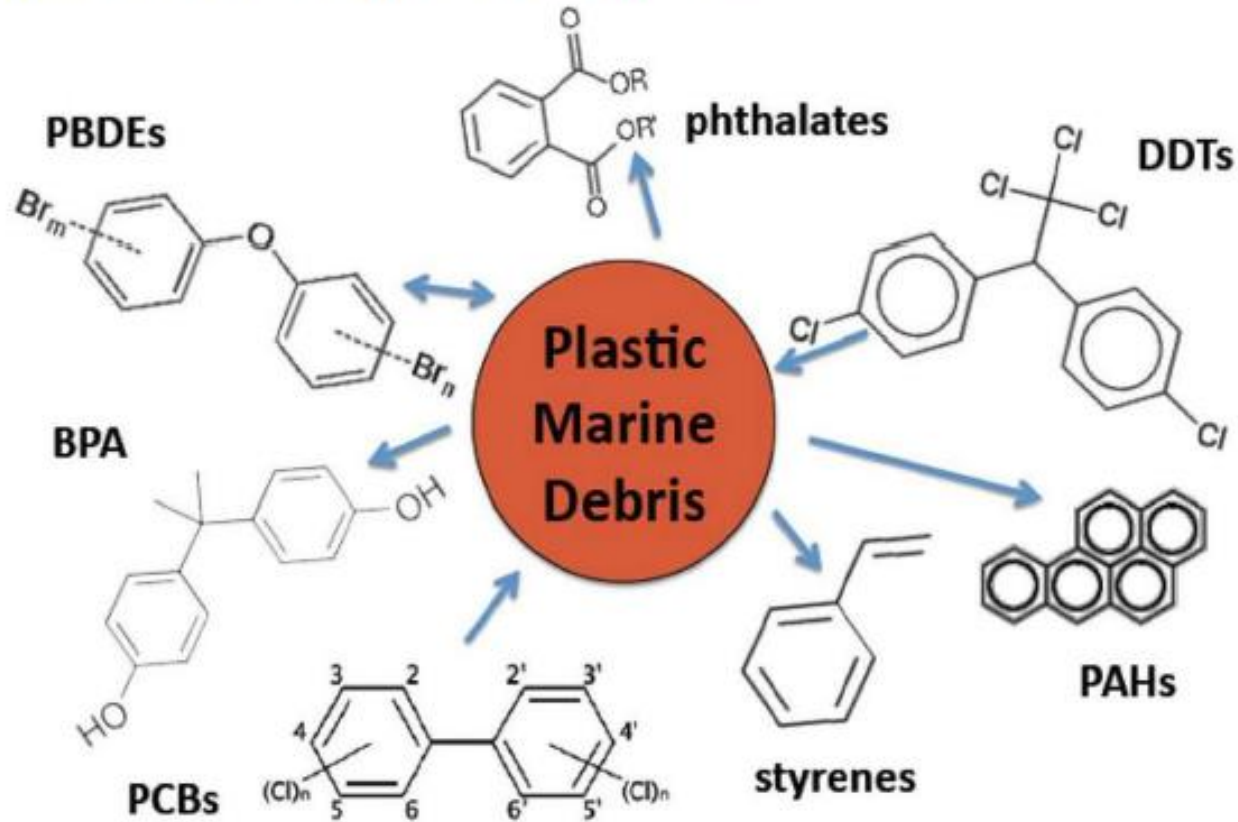
Bioaccumulation/biomagnification in the aquatic environment

Persistent pollutants (PAHs, PCBs, pharmaceuticals, microplastics, etc)



Plastic debris concentrate toxic substances

Plastic absorbs toxic chemicals

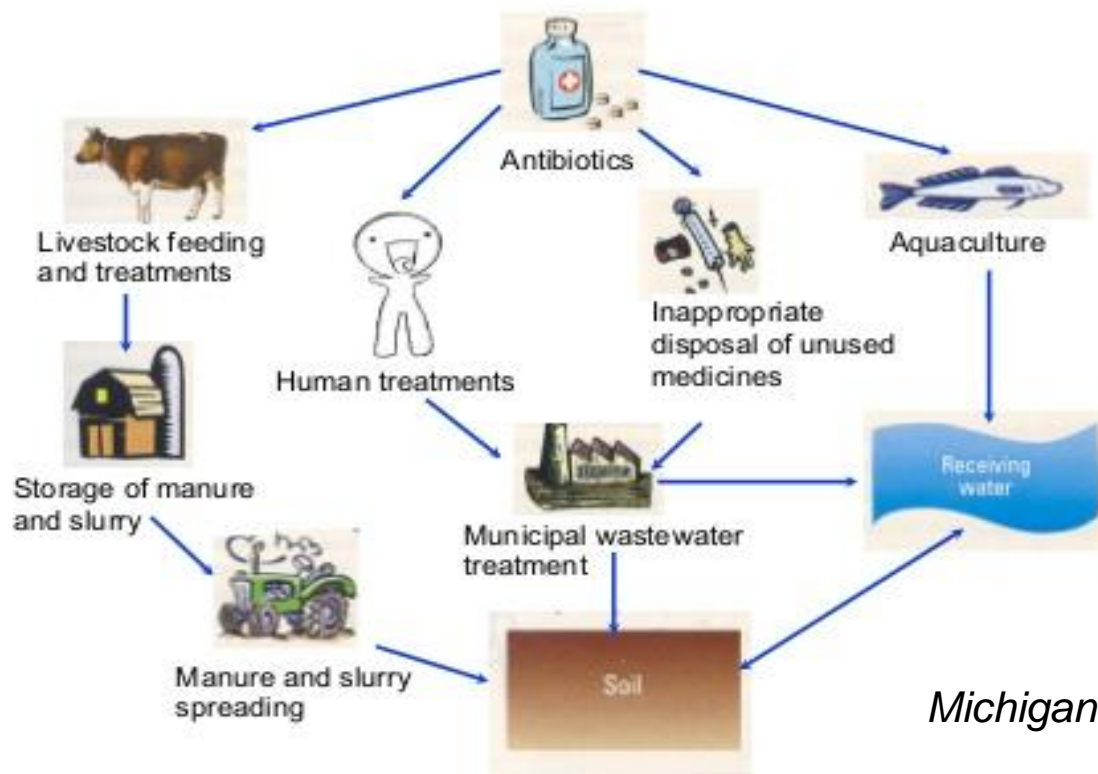


...and leaches toxic chemicals

Pharmaceuticals in aquatic ecosystems

Pathways for Pharmaceuticals into the Environment

Antibiotics
Steroids
Anti-inflammatory
drugs
Analgesics



Michigan State University

Pharmaceuticals - identified in the Danube River during JDS 3 (amoxicilin, diclofenac, 17 beta estradiol, etc) (ICPDR, 2015)

Impact of pharmaceuticals on wildlife and human health

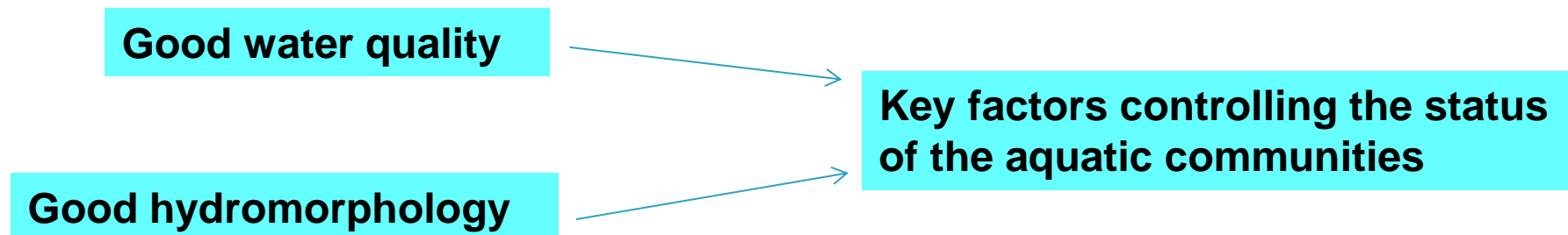
Adverse health effects on aquatic organisms:

- Male fish feminization
- Reproductive deficiencies
- Endocrine disruption
- Kidney and liver damage
- Decreased growth
- Behavioral changes



Pharmaceuticals can be transferred to human through drinking water or food, inducing allergies, bacterial resistance to antibiotics (problems in infection control), endocrine disruption or possible genomic injuries of DNA (Li et al., 2007)

Take away message



A pre-requisite to ensure the revival of sturgeons is to ensure good water quality and hydromorphology (habitats)

Not only sturgeons should be targeted by restoration measures, but also the species on the lower trophic levels who sustain their life

Need to ensure GES in the Danube River Basin and the Black Sea

Thank you for your attention

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