

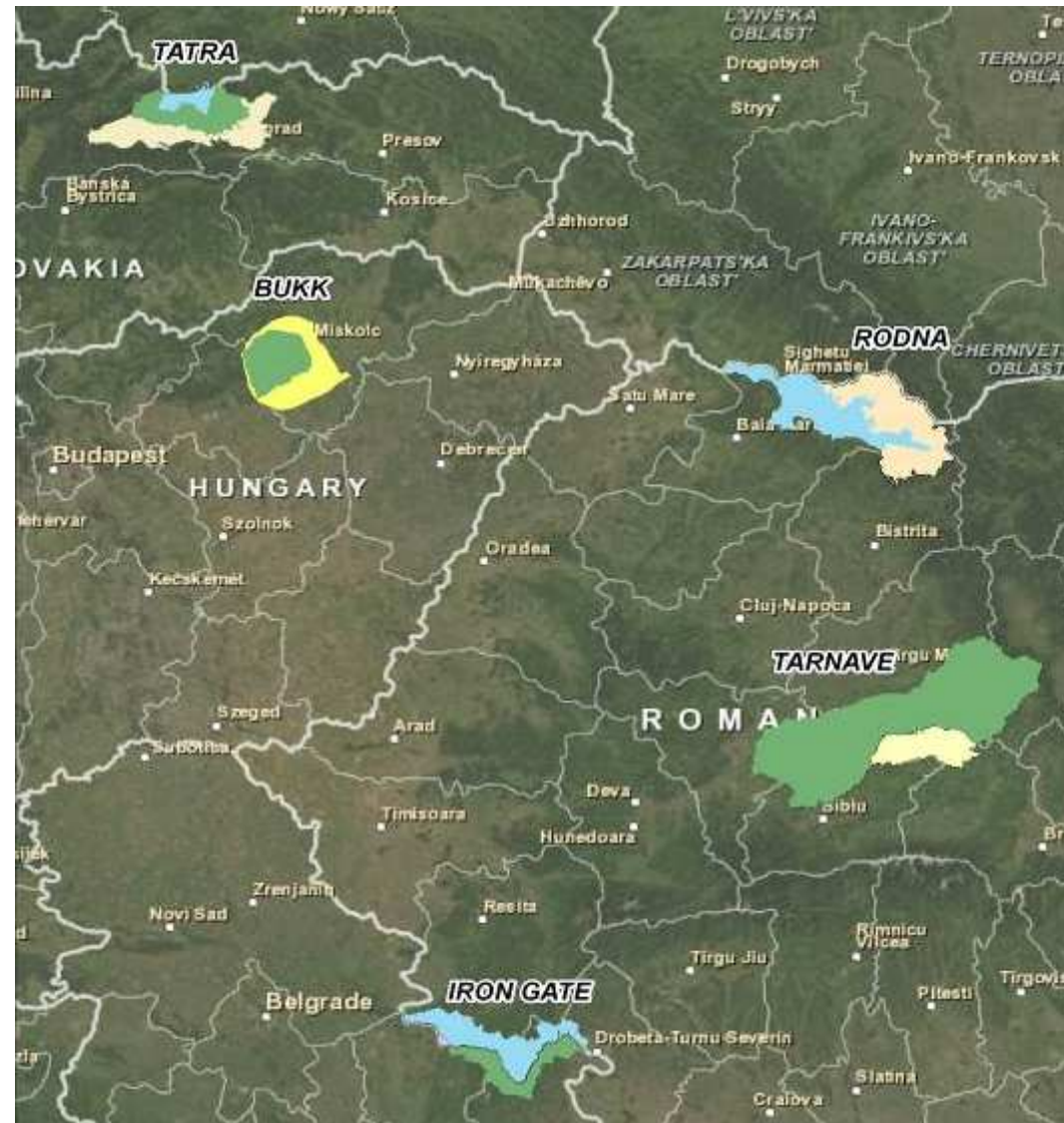
Vulnerability Assessment and Adaptation Measures in Focal Areas

István Zsuffa

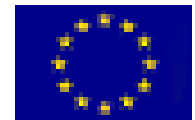


The Focal Areas

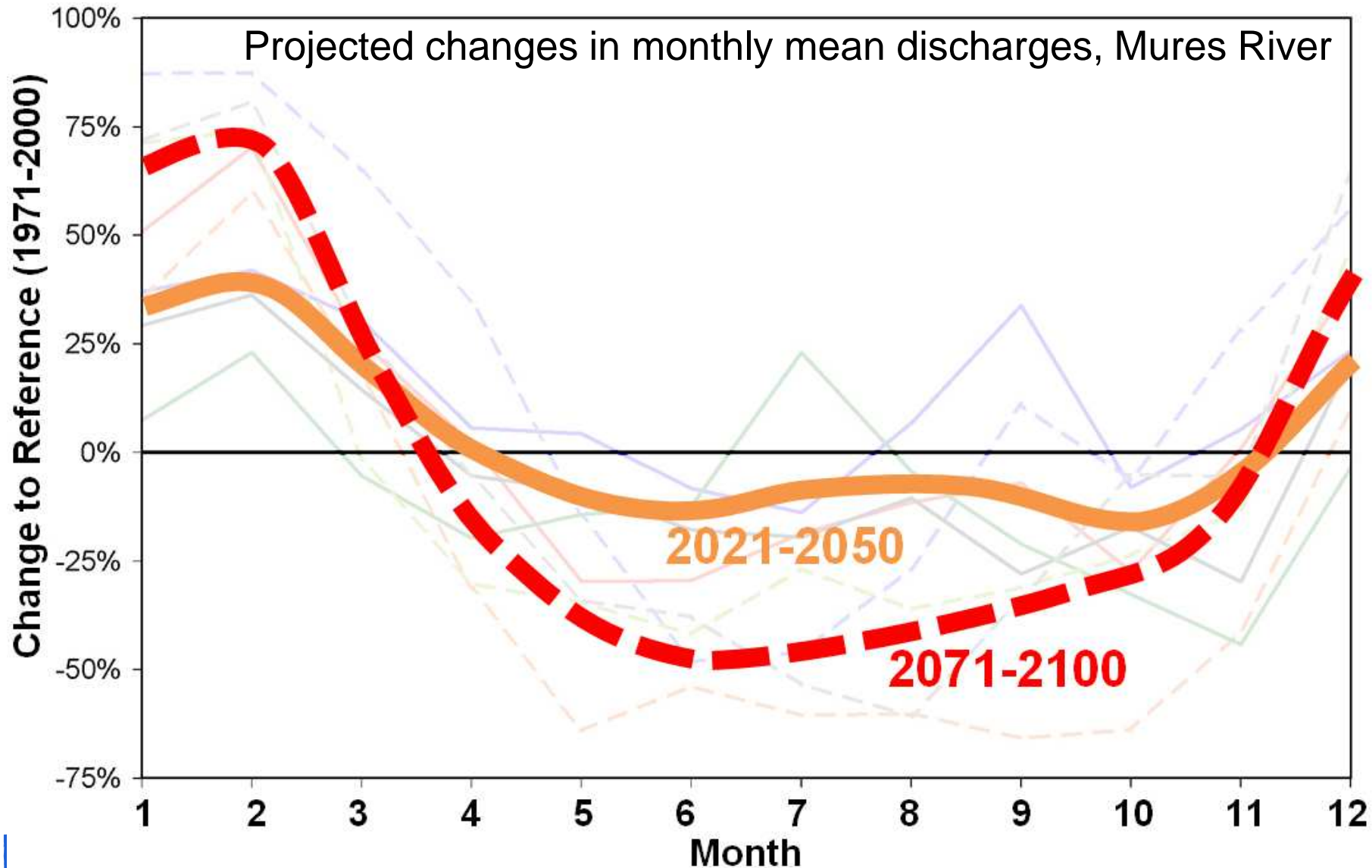
- Bükk
- High Tatras
- Rodna-Maramures
- Tarnave Mare
- Iron Gate Parks



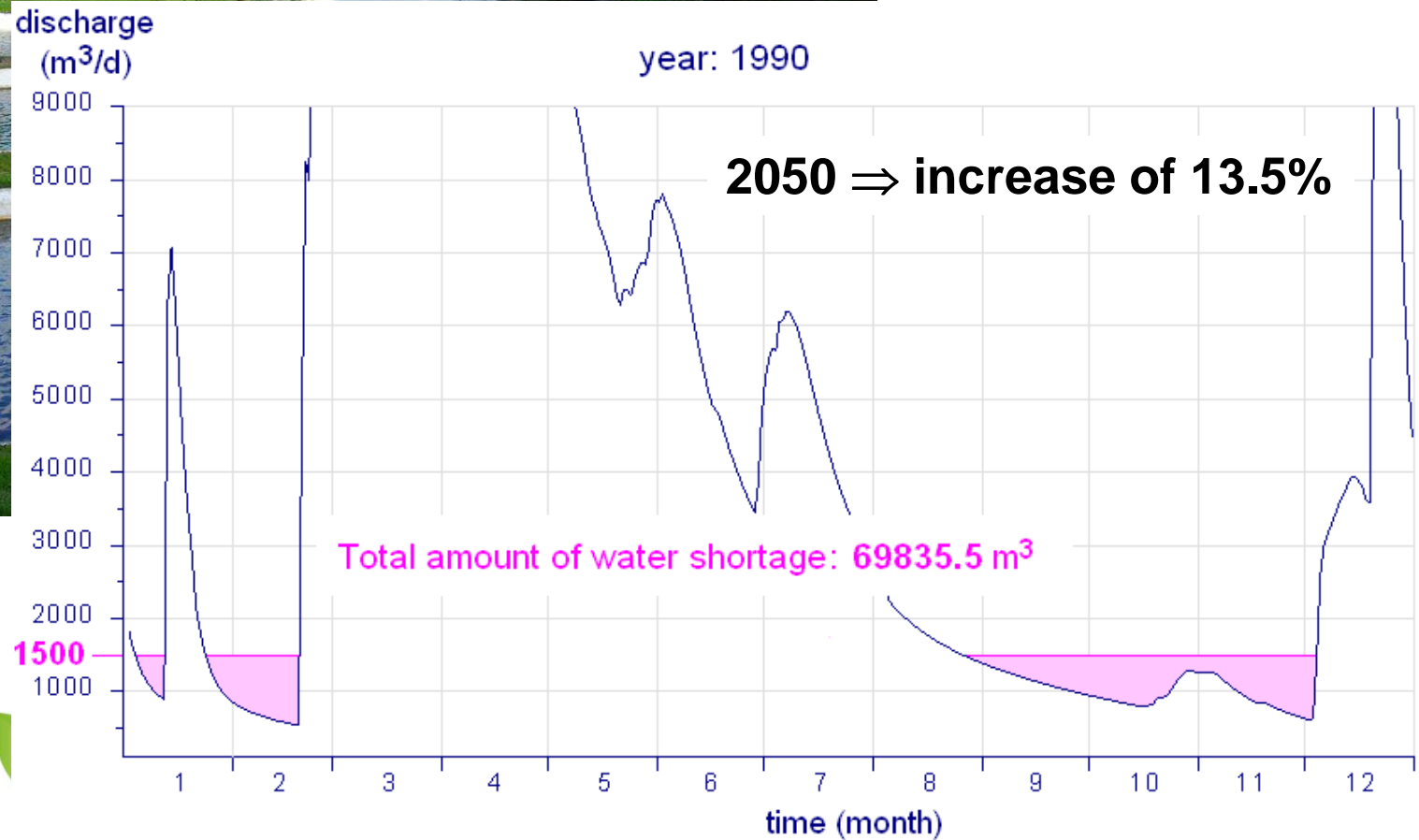
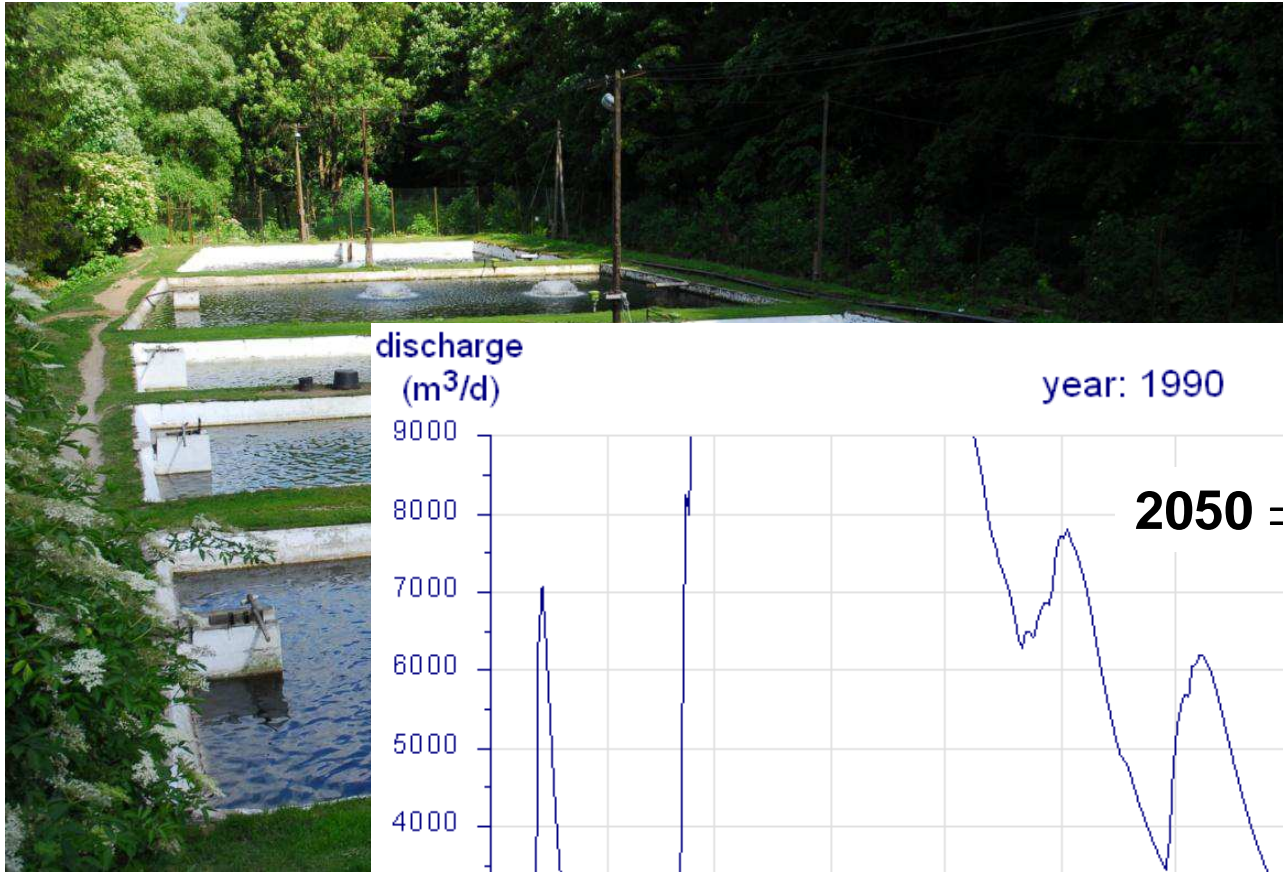
Impacts



Impacts on hydrology

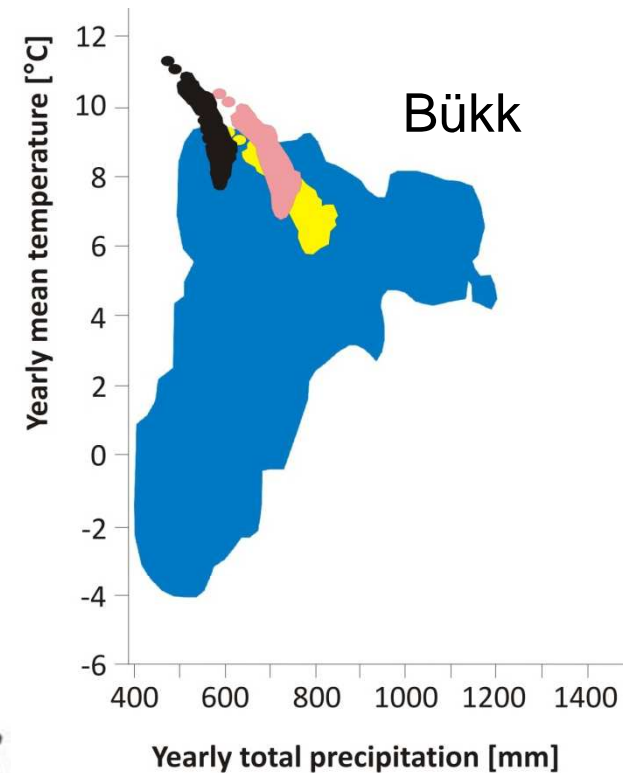
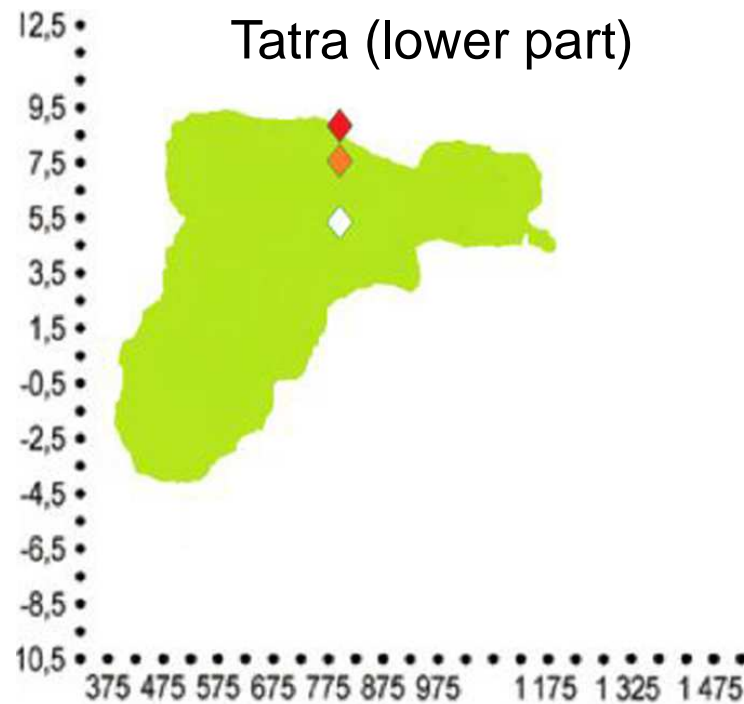


Trout farm in the Bükk:



Impacts on vegetation

Precipitation and temperature limits for spruce forest
+ current and projected climatic conditions:

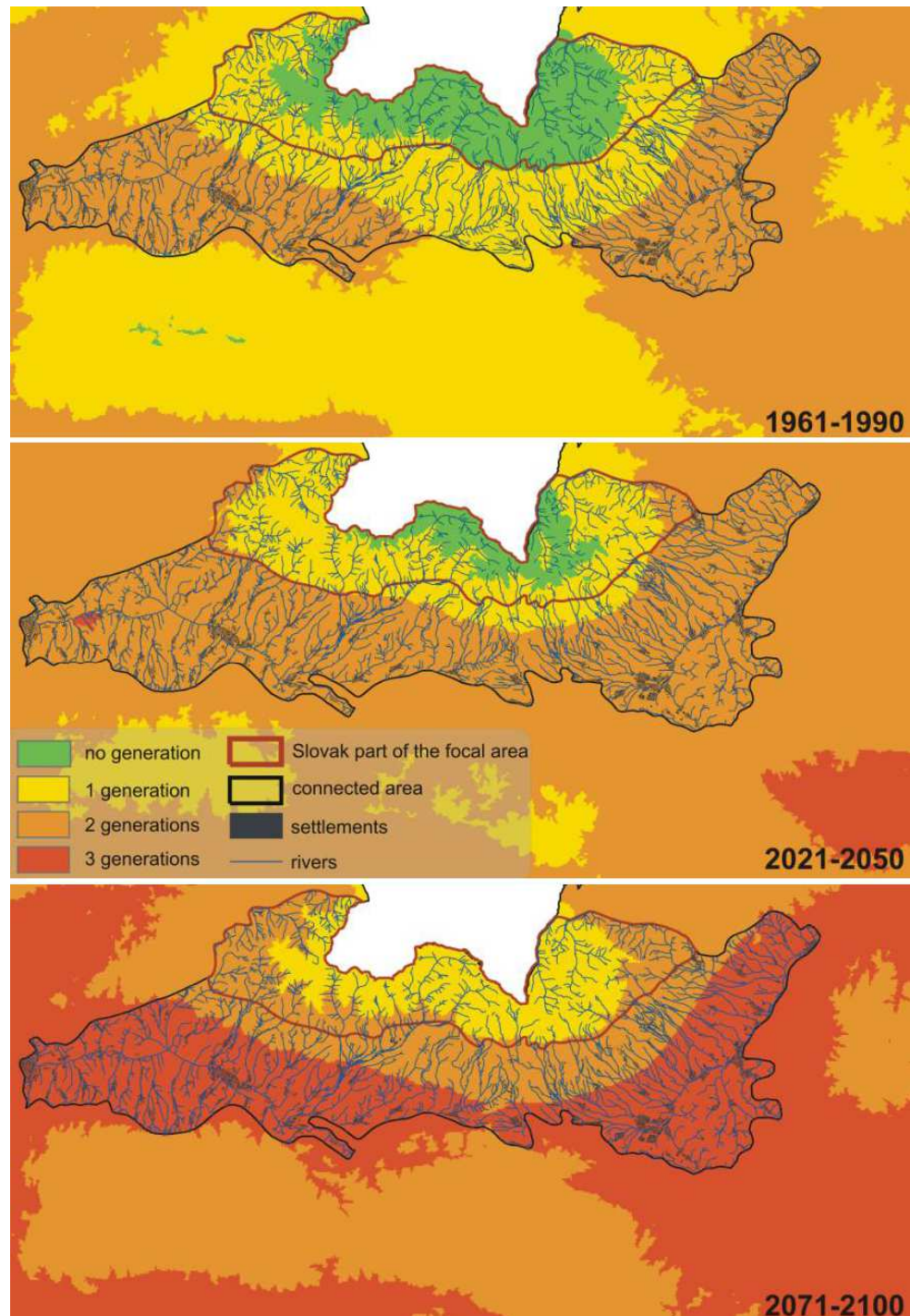


Legend:

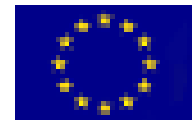
Bark beetle infestation in the Tatra:



Projected development of bark beetle in the Tatra:

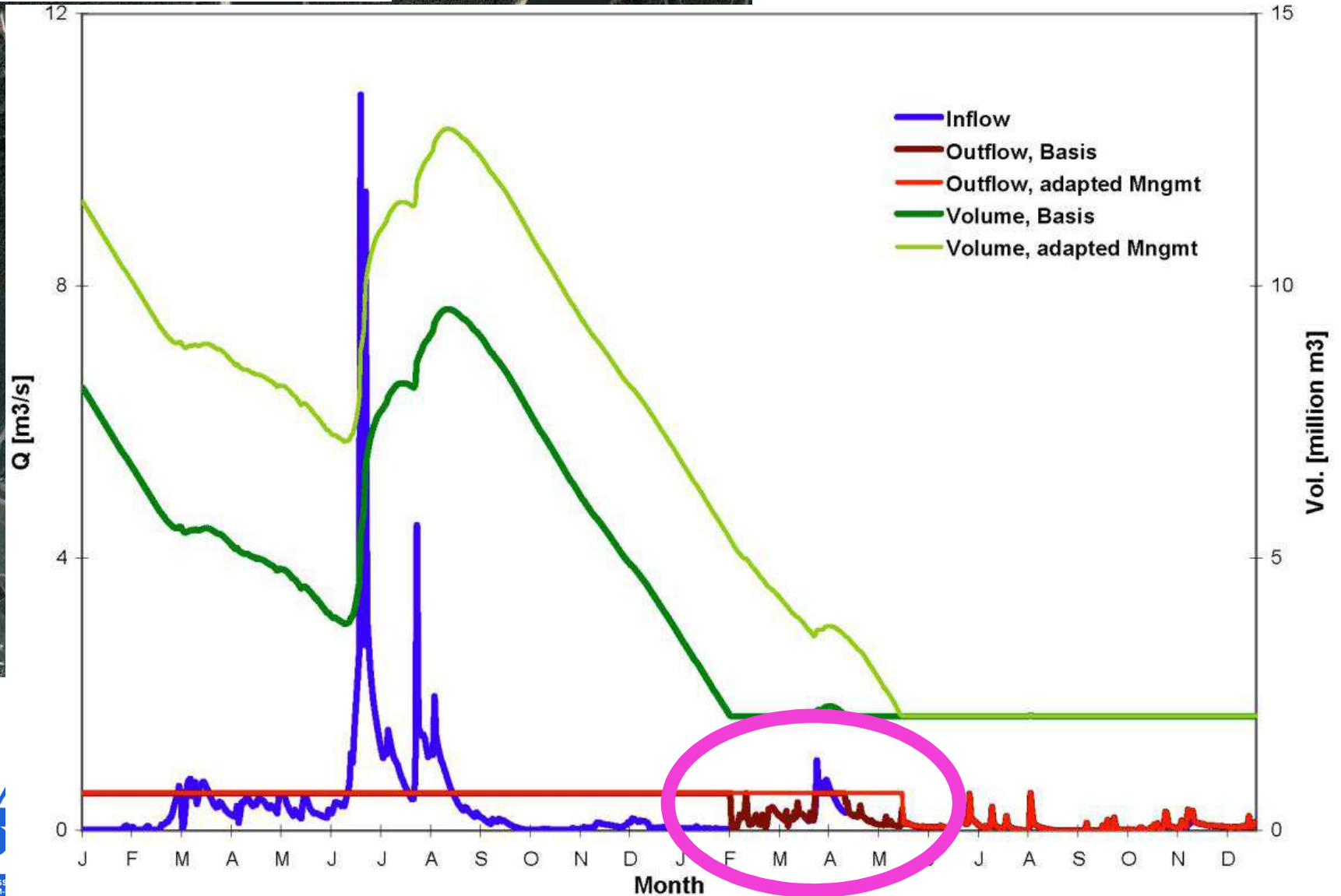


Adaptation measures



Adjusting the operation of existing infrastructure

Zetea reservoir, Tarnava River



Improving water storage capacities

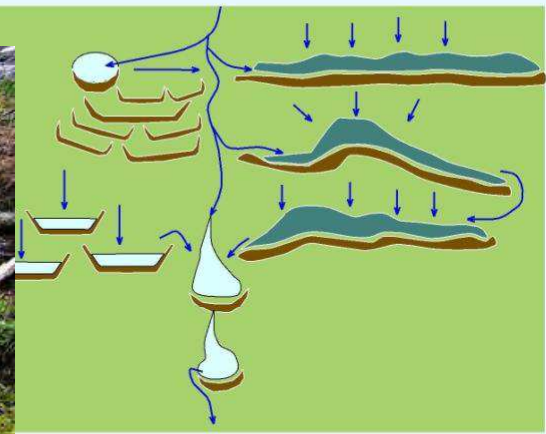
- Constructing new reservoirs
- Rainwater harvesting on slopes

Microstructures for the rainwater harvesting on land

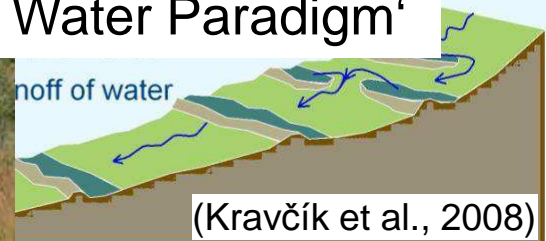
Combination of different rainwater harvesting technologies

Contoured barrages

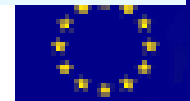
Experimental rainwater harvesting installations in the Tatra



‘Water for the Recovery of the Climate - A New Water Paradigm’



(photos: Kravčik and Kohutiar)



- Protecting/restoring the infiltration areas

Grassland on the Bükk plateau with a sinkhole in the forefront:



- Eliminating roads on the upper catchment areas
- Erosion
- **Acceleration of runoff**

Mountain roads
in Maramures:



(photo: Braakhekke et al., 2005)

Activities requiring frequent transportations (e.g. hay production) have to be replaced by transportation-free landuses:

- ‘natural grazing’ (Braakhekke et al., 2005)
- ecotourism

Adaptation of the vegetation cover

- Adaptation of composition

Replacing spruce with resistant species:

Bükk: beech

Tatra: white fir

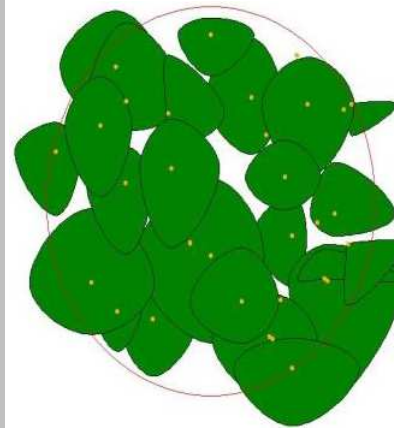
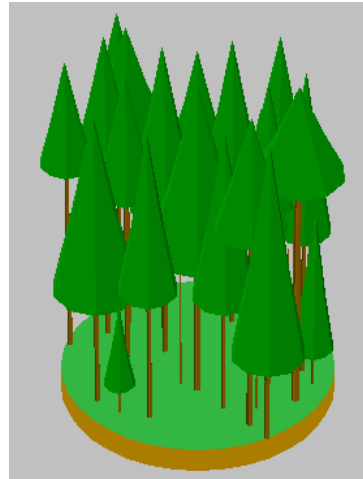
Rodna-Maramures:
larch, fir, mountain
sycamore

Beech saplings planted on spruce area after bark beetle infestation: Bükk

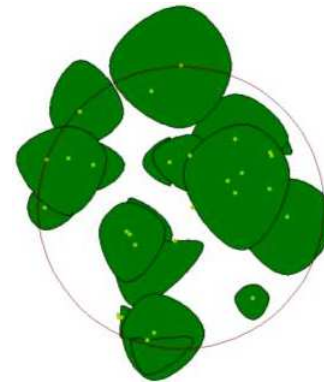
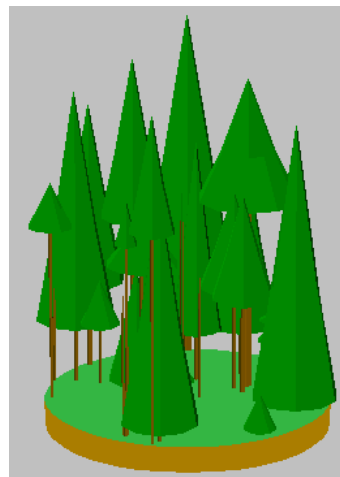


- Adaptation of structure

Simple vertical structure and regular horizontal tree distribution of non natural, low resistance stand



Diversified vertical and cluster-like horizontal tree distribution of natural, high resistance stand



Adaptation of the management context

The proposed landuse adaptation measures can hardly be implemented without modifying the management context.

Compensation schemes:

Forests: Payments for Ecosystem Services (PES)

Agricultural lands: High Nature Value farming (HNV)

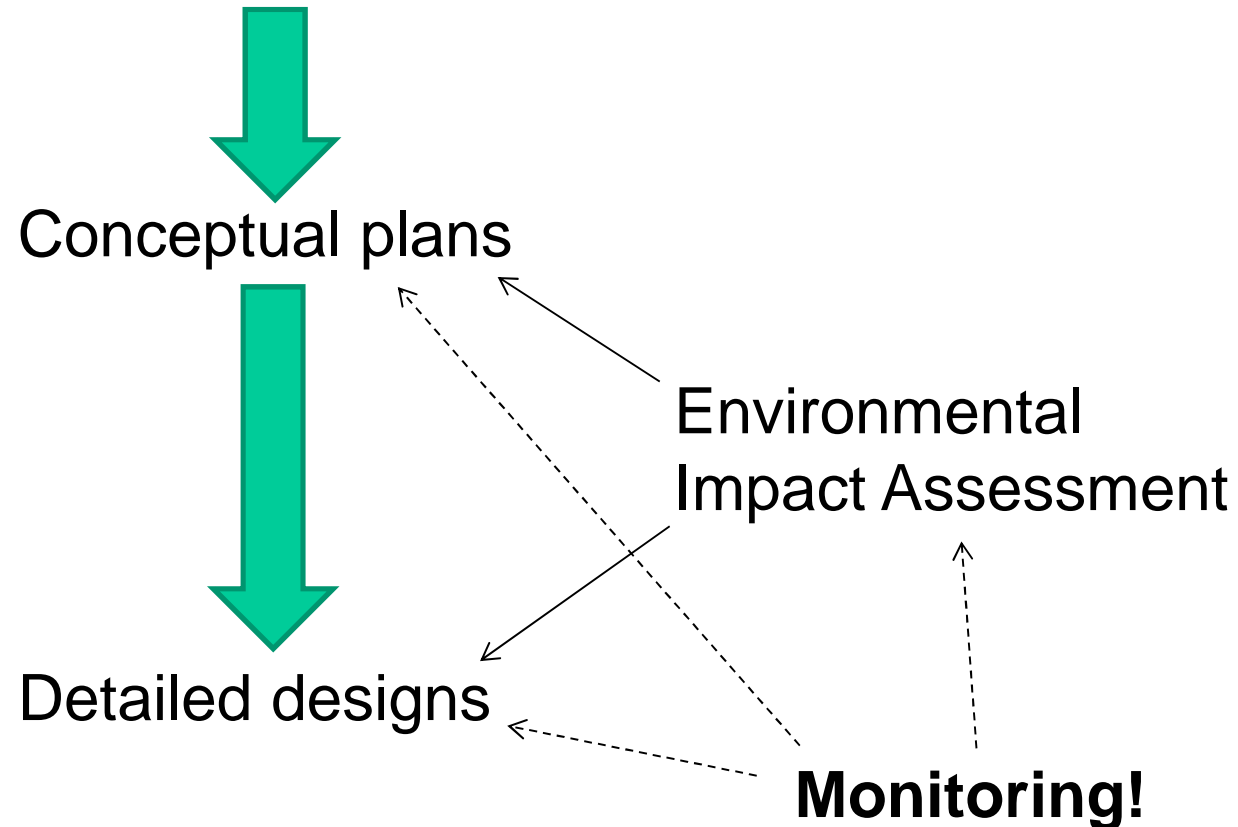
Alternative economic activities: tourism and ecotourism!

Tarnava Mare,
Rodna-Maramures



Recommendations

Adaptation measures



Thank You!

www.carpathcc.eu

