




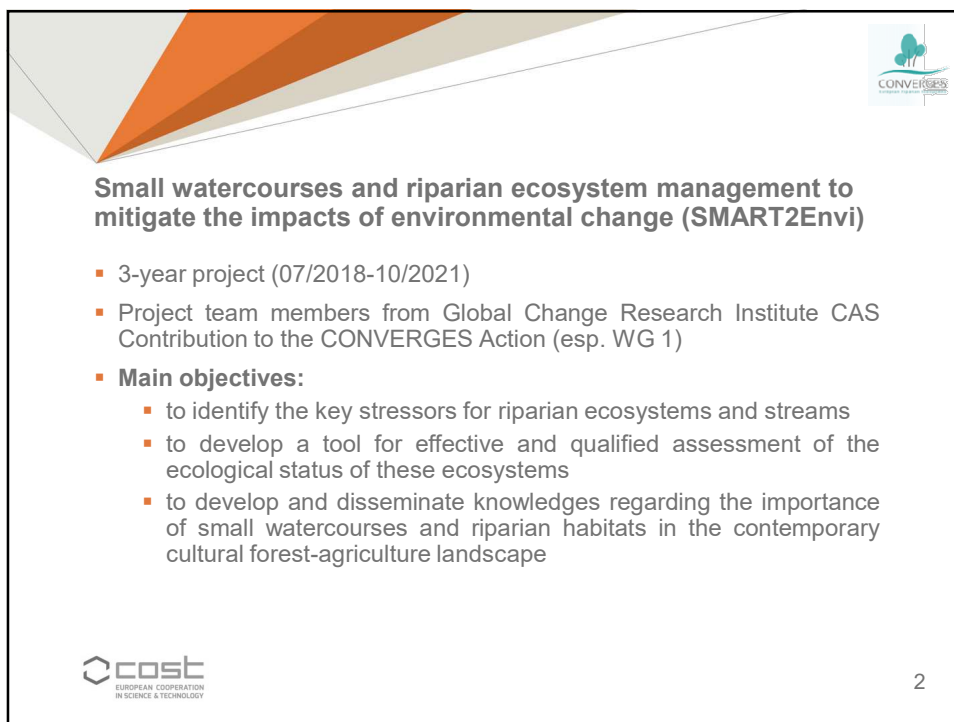
Growing
ideas
through
networks

Mapping environmental state of riparian habitats of small streams in agricultural-forest landscape

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Small watercourses and riparian ecosystem management to mitigate the impacts of environmental change (SMART2Env)

- 3-year project (07/2018-10/2021)
- Project team members from Global Change Research Institute CAS
Contribution to the CONVERGES Action (esp. WG 1)
- **Main objectives:**
 - to identify the key stressors for riparian ecosystems and streams
 - to develop a tool for effective and qualified assessment of the
ecological status of these ecosystems
 - to develop and disseminate knowledges regarding the importance
of small watercourses and riparian habitats in the contemporary
cultural forest-agriculture landscape



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■ **Project outputs:**

- Tool (methodology/ software) for assessment of ecological status of riparian habitats
- Stakeholders workshop
- Research article(s) in IF journal

■ **Areas of interest:**

- Small stream catchment(s) in the Czech Republic + ?
- Agricultural (forest-agricultural) landscape



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Assessment of ecological status of riparian habitats



■ **Riparian Habitat Quality Index (RHQI) – work in progress**

- General characteristics (for purposes of determining the weights of indicators)
 - 1 Morphometric characteristics of the riverbed and riparian zone
 - 2 Hydrological regime of the watercourse
 - 3 Biotic characteristics of the riparian zone
- 17-20 indicators in total
- evaluation takes place in homogeneous river segments with regard to the character of the banks and the riparian zone
- assigning a point value to each indicator
- in case of some indicators the final point value is adjusted by the weights (to take into account potential natural status)
- the sum of all values for each indicator represents the final information about the quality of riparian habitats in the river segment



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Riparian Habitat Quality Index (RHQI) – *work in progress*



- General characteristics
 - W1 Stream segment location within the watershed
 - W2 Naturalness of stream banks
- 1 Morphometric characteristics of the riverbed and riparian zone
 - 1.1 Average slope of the stream banks within the segment
 - 1.2 Average channel incision within the segment
 - 1.3 Channel forming material
 - 1.4 Stream banks stability
- 2 Hydrological regime of the watercourse
 - 2.1 Frequency of flooding of the inundation area
 - 2.2 Potential for flooding of the inundation area
 - 2.3 Discharge control measures



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Riparian Habitat Quality Index (RHQI) – *work in progress*



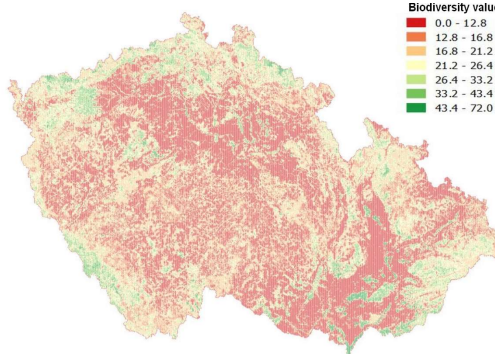
- 3 Biotic characteristics of the riparian zone
 - 3.1 Average width of the riparian zone (during approximate water level corresponding to Qa)
 - 3.2 Woody vegetation coverage of the riparian zone
 - 3.3 Vegetation structure of the riparian zone
 - 3.4 Connectivity of the riparian zone with fluvial ecosystem (floodplain forest, wetland)
 - 3.5 Number of vegetation floors developed in the riparian zone
 - 3.6 Tree species diversity in the riparian zone of the given stream segment
 - 3.7 Share of non-native tree species in the riparian zone
 - 3.8 Prevailing land cover character beyond the riparian zone
- + 2-3 ecological indicators based on *Biotope Valuation Methodology* (Sejálk et al., 2003)



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Biotope Valuation Method (BVM)

- Biotope Valuation Method – BVM (Sejak et al. 2003), based on the original Hessen method, evaluates 176 habitat types in the Czech Republic (138 Natura 2000 natural and near to nature habitats and 38 more anthropically influenced habitats)
- All habitats were divided into five groups according to their naturalness: natural habitats (forests, wetlands, peat bog), close to nature habitats (meadows), distant to nature habitats (degraded meadows), alien to nature habitats (fields), anthropogenic habitats (built-up area)



Biodiversity value

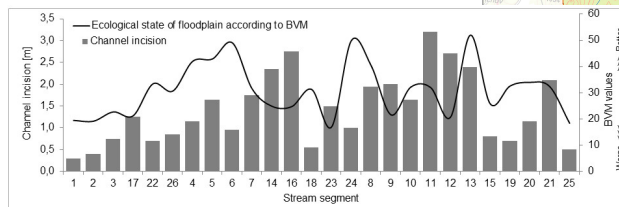
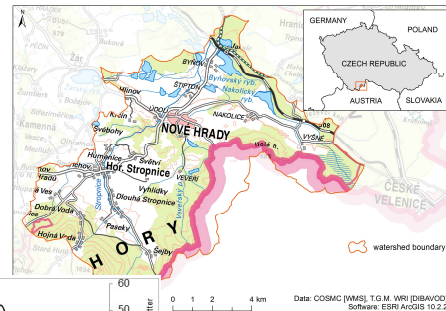
0.0 - 12.8
12.8 - 16.8
16.8 - 21.2
21.2 - 26.4
26.4 - 33.2
33.2 - 43.4
43.4 - 72.0

Description of the 8 characteristics to calculate the point value of the habitat by BVM method

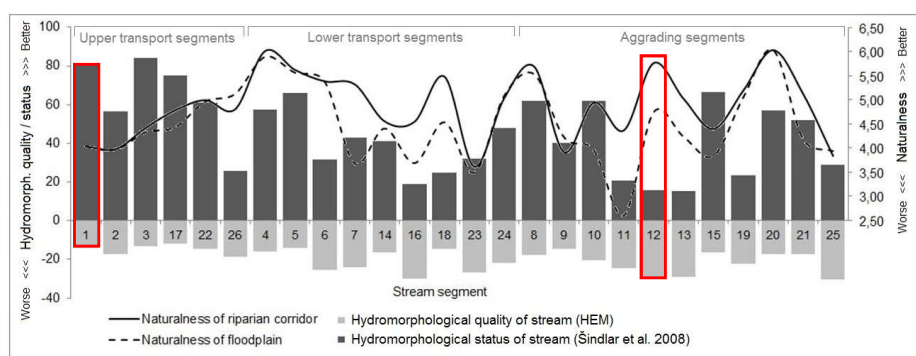
M	Habitat matureness (points according to phylogenetic age of species)
N	Habitat naturalness
DL	Diversity of layers-structures (6 points to all vegetation layers)
DS	Diversity of plant species (points according to number of autochthonous plant species)
RB	Rareness of habitat (points according to geographical and climatic uniqueness, scarcity, frequency)
RS	Rareness of plant species (points according to number of rare and endangered species)
SB	Sensibility (vulnerability) of habitat type (points according to the potential vulnerability under environmental change)
TB	Endangerment of quantity and quality of habitats (points according to the decrease of the number and quality of habitats)

Linking hydromorphological degradation with environmental status of the floodplain of small watercourses: a case study in the Stropnice River basin, Czech Republic

- in more than 90 % of the total length of the watercourses the character of linkages is directly influenced by anthropogenic activities
- degraded streams in lowland sites are often encompassed by close-to-nature habitats



Linking hydromorphological degradation with environmental status of the floodplain of small watercourses: a case study in the Stropnice River basin, Czech Republic



contradictory hydromorphological and ecological status due to anthropogenic pressure

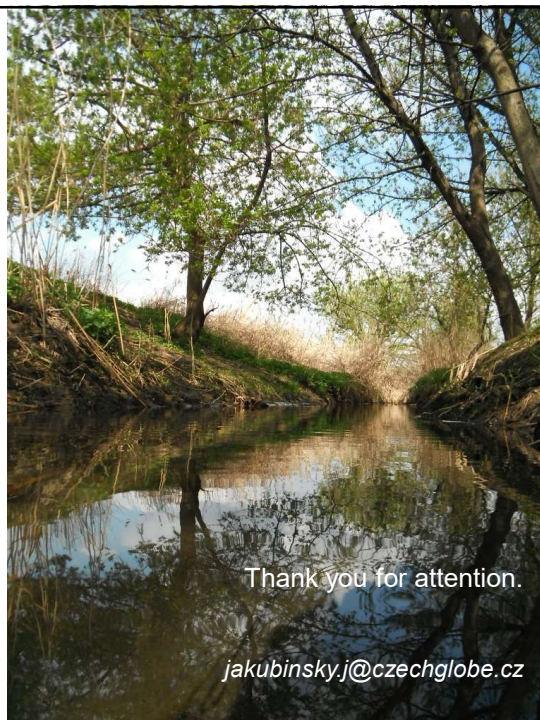
Next steps ...



- To apply the methodology developed on the selected study area(s) in the Czech Republic (in order to verify the usability and suitability of the selected parameters,
- To select appropriate areas (small stream catchments) meeting the conditions abroad and apply the methodology here (if someone will be interested in cooperation),
- To create a database of the current ecological status of riparian habitats in the European cultural landscape,
- To publish the results somewhere ☺ ...



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Thank you for attention.

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