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LAND OBERÖSTERREICH

Selection of habitats for resettlement – the strategy in the Austrian freshwater pearl mussel project

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International workshop „Freshwater mussels: Search for resettlement habitats and evaluation of protection measures“

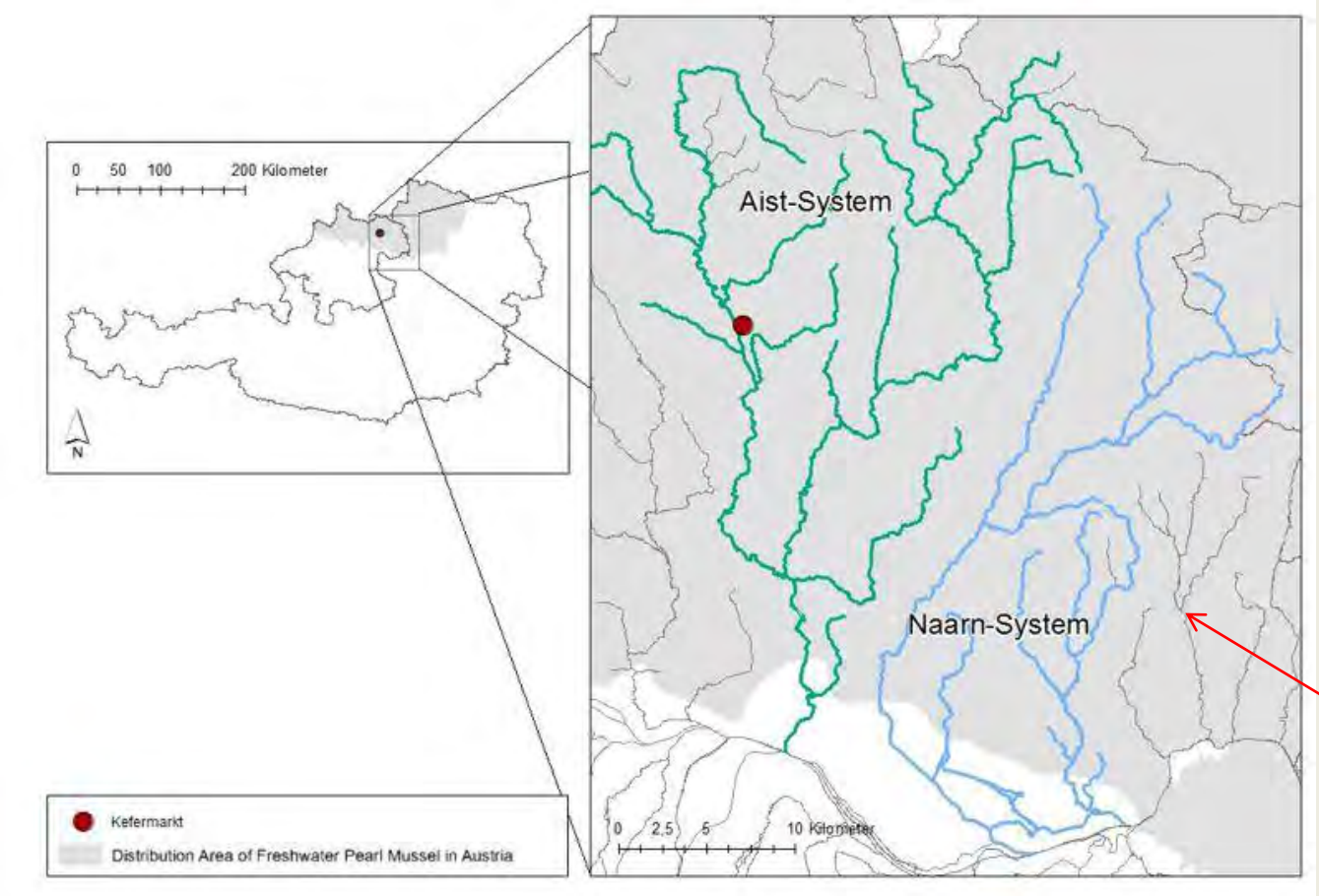
Dresden, Germany, 25. – 27.03.2019

The freshwater pearl mussel (*Margaritifera margaritifera*) in Austria

- Declining populations → need for a conservation project

→ „Vision Flussperlmuschel“
  - Since 2011
  - Funded by the Office of the State Government of Upper Austria and the European Union
  - Aim: Establishment of reproductive populations in selected river systems

Project area



Choice of a suitable habitat

- The foundation for successful resettlement efforts is the choice of the right site

- Key parameters:
  - Absence of sewage plants, high ranking traffic routes and big settlement areas
  - Rich structural equipment
  - Heterogenous water flow velocities
  - Heterogenous substrate conditions
  - Suitable physico-chemical conditions
  - **Stability and resiliance**

➔ Working steps are chosen to evaluate these parameters

Hydromorphological mapping

- Evaluation of rivers with regard to:
  - Water course
  - Riverside dynamic
  - River bed dynamic
  - Substrate composition
  - Structural equipment
  - Riverside vegetation
  - Levels of fine sediment deposition
  - Presence of potential threats (artificial barriers,..)

➔ Further investigations at potential river segments



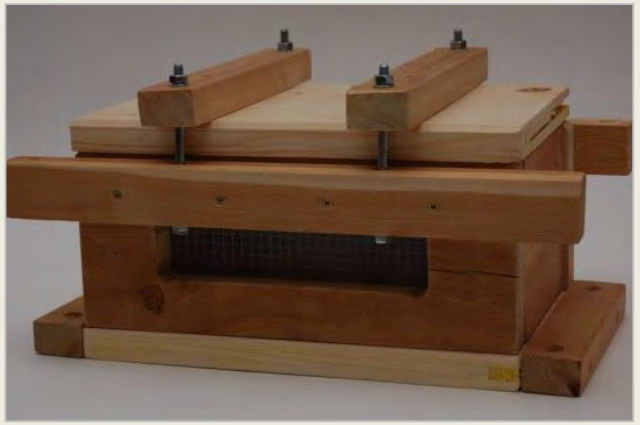


Biomonitoring in the open water

- Buddensiek-cages (following BUDDENSIEK (1995)
- Mussel silos (following BARNHART et al. (2007), concrete and granite)
- Wooden cages (following ELENDER)

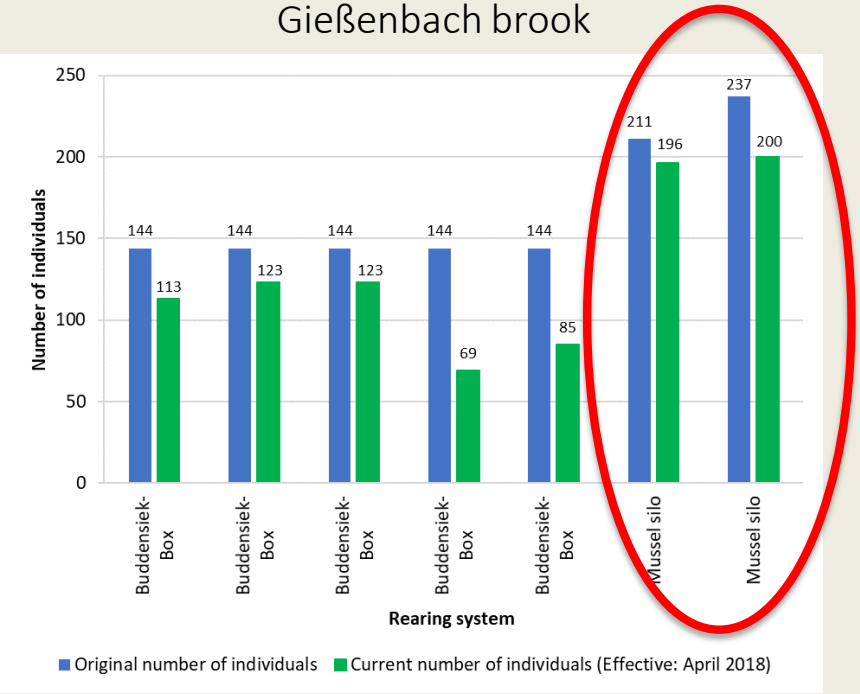




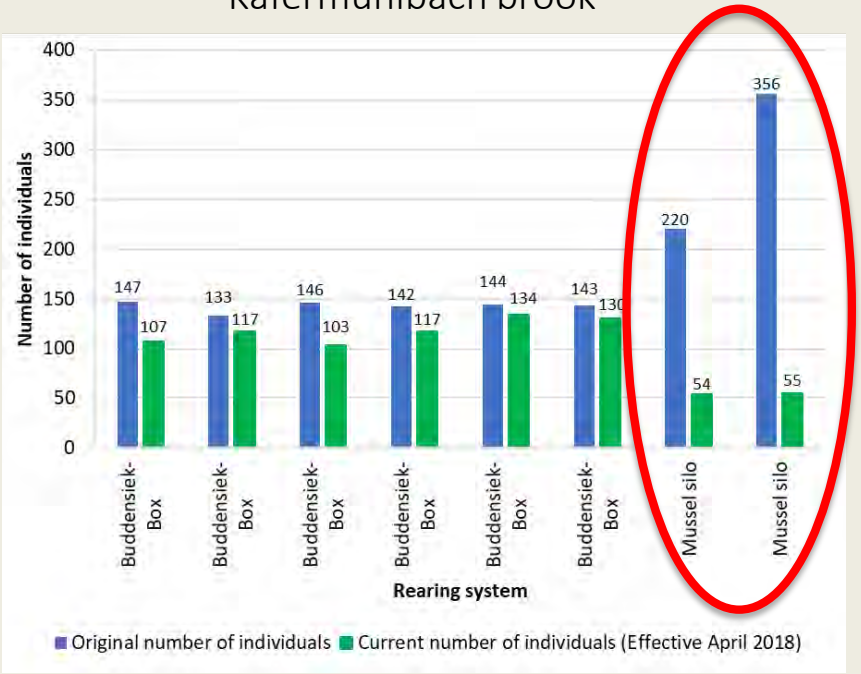


Biomonitoring in the open water

Gießenbach brook



Käfermühlbach brook



➔ Proper rearing systems have to be chosen depending on the river characteristics

Biomonitoring within the interstitial

- Since 2016
- Use of juvenile mussels to assess the food- and oxygen availability
- Custom built substrate boxes have been used since 2017
- Results showed survival rates of 80 – 100% after an exposure of 4 months





Stability of sites



Temporal changes have to be taken into account!



An example for a stable site – the „Haidmühle“



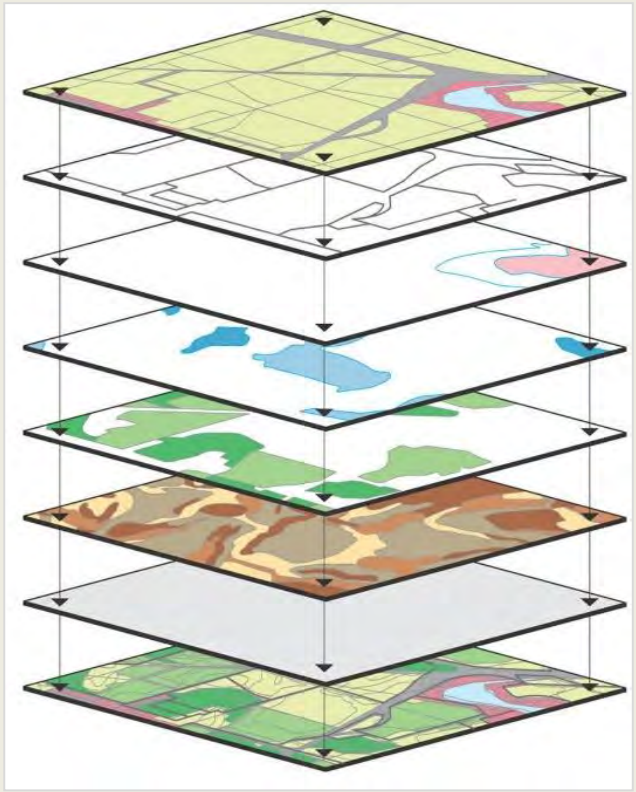
Potential threats

- Identification of potential threats is crucial for the success of resettlement actions

- Application of GIS-based analysis to evaluate whole catchment areas

- Example: Erosion-prone forest areas as a potential threat to mussel populations
  ➔ Choice of favorable areas for improvement measures using GIS

GIS analysis – general approach



Potential area of measures

↓

Targeted area

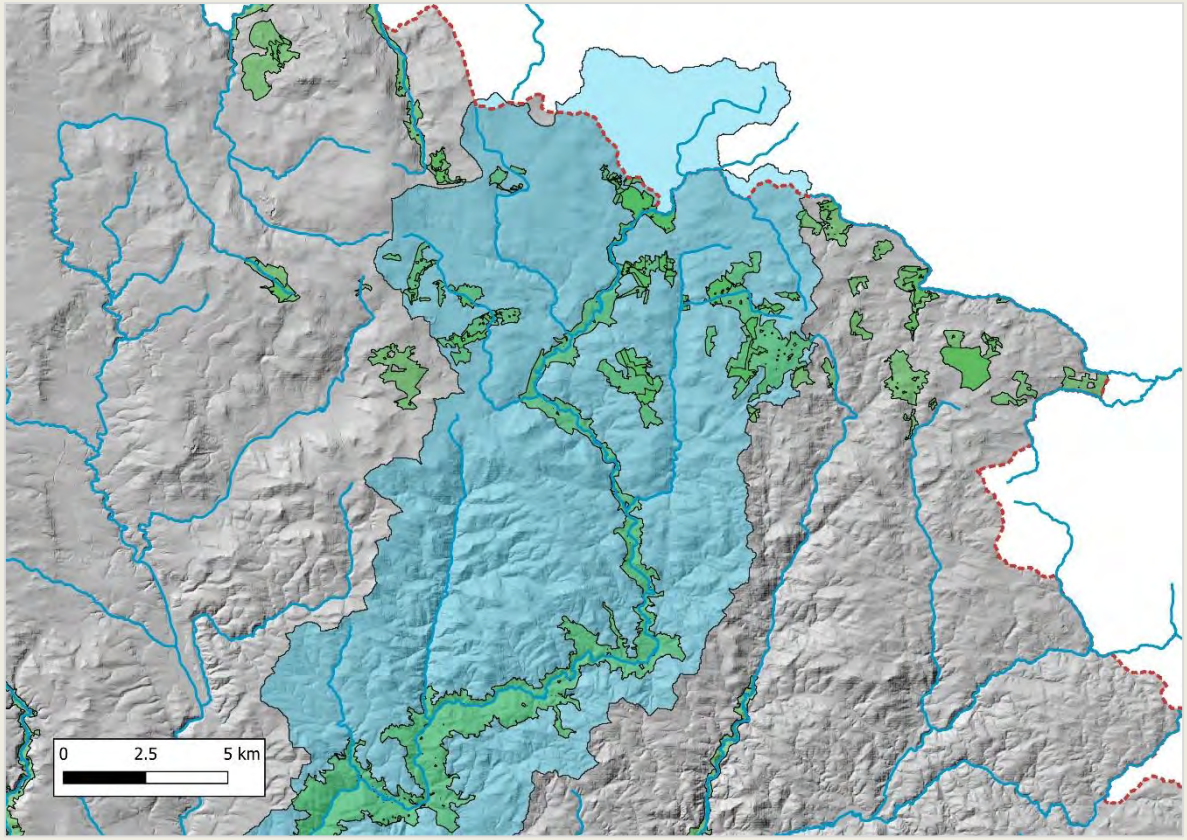
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Hillslope/Land use

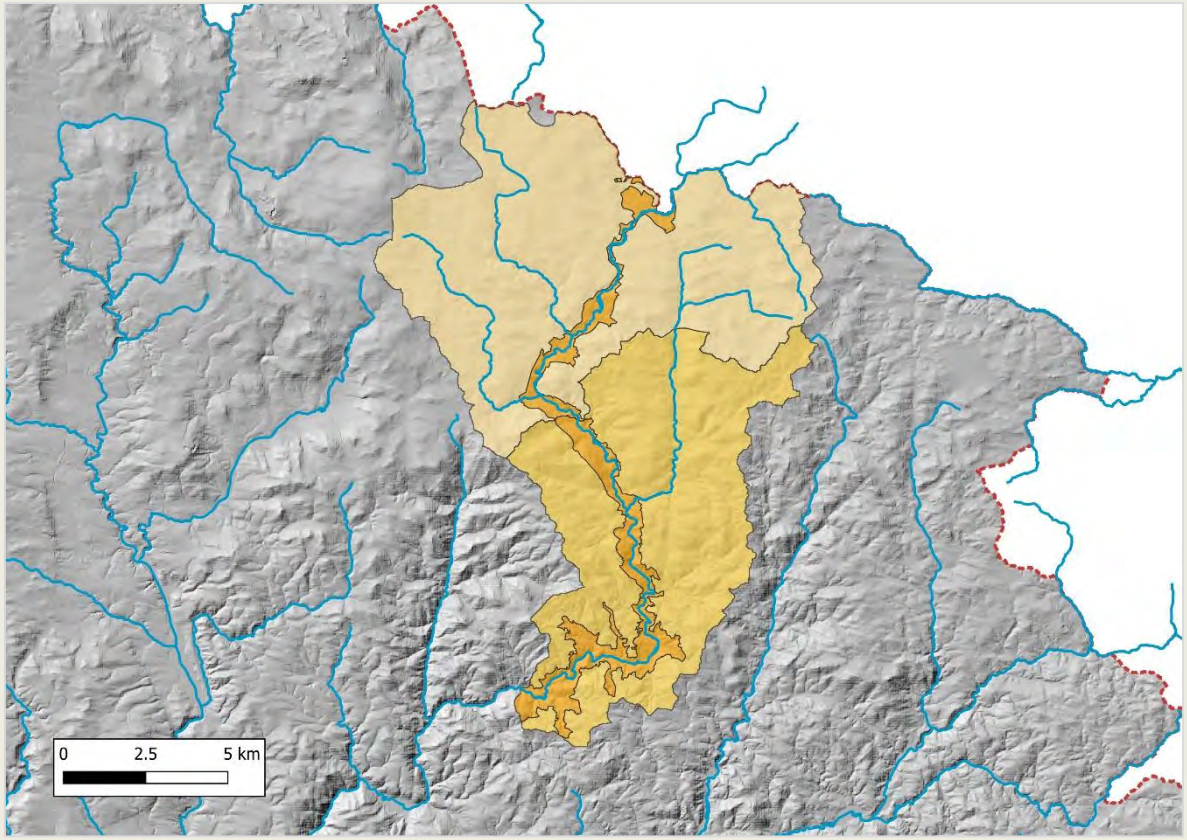
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Priority site for the execution of measures

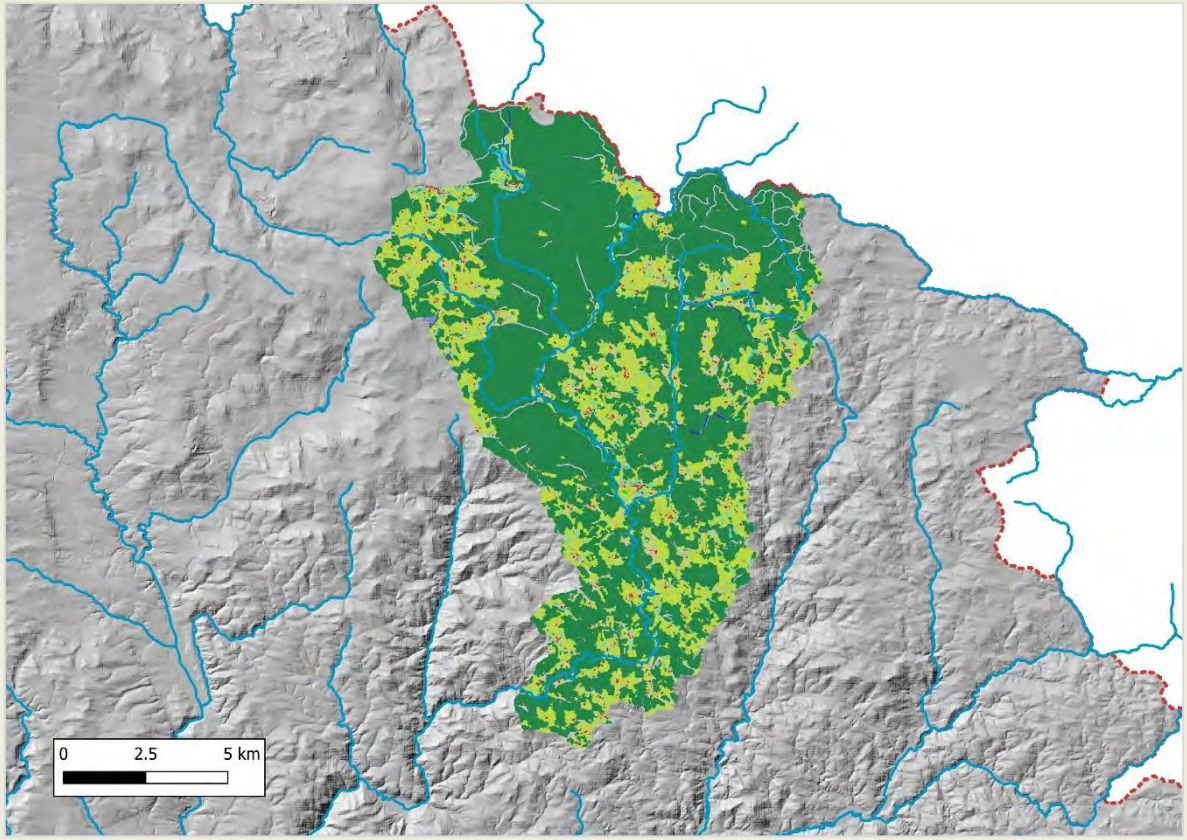
GIS analysis – potential area of measures



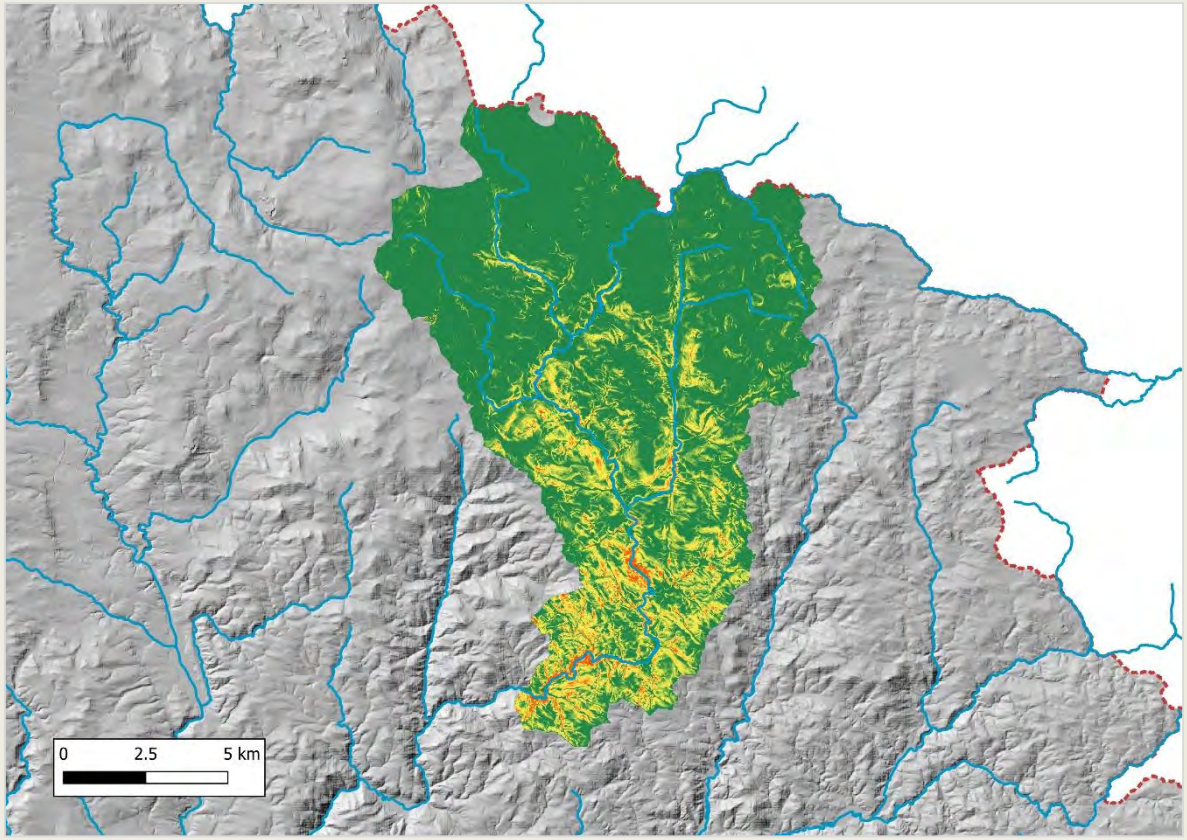
GIS analysis – defining priority areas



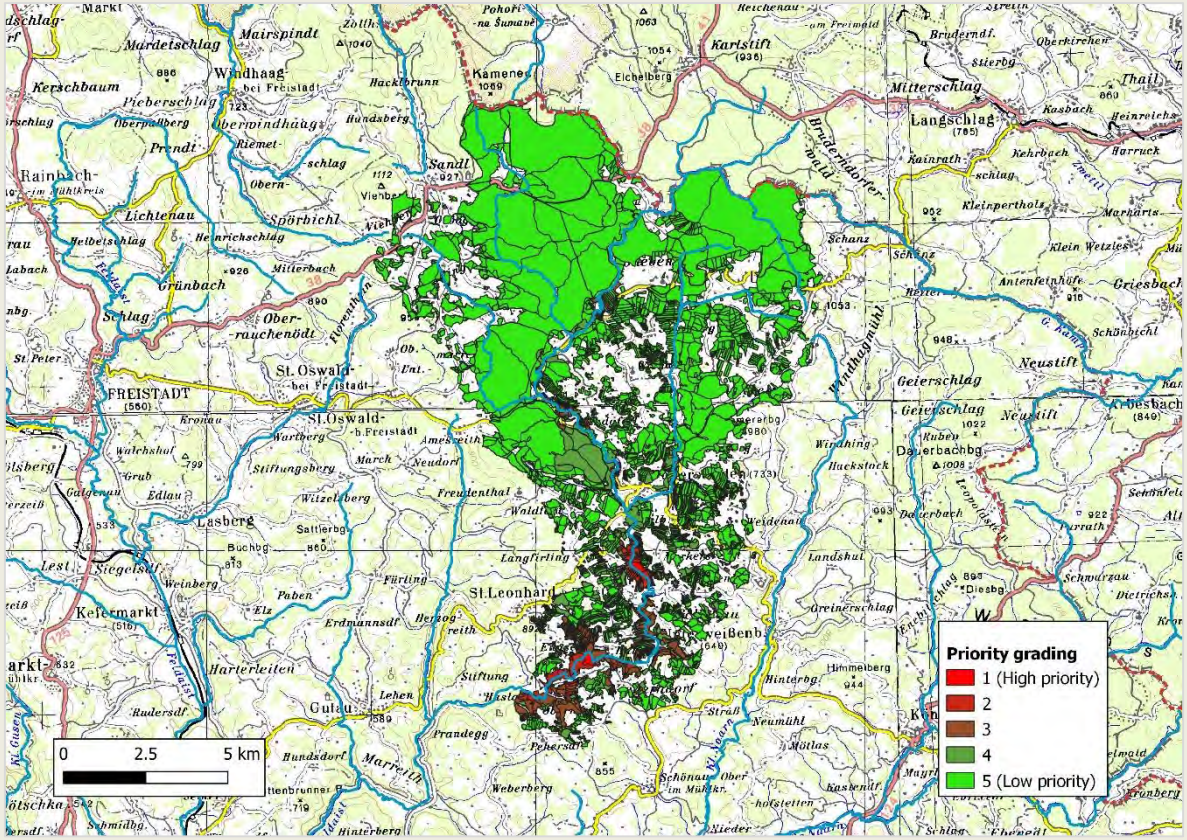
GIS analysis – land use in the priority area



GIS analysis – hill slope in the priority area



GIS analysis – final result



Conclusion

- Potential sites have to meet several parameters → evaluation in the field ("expert judgement")
- Continuous observations over a long period are necessary to evaluate the suitability of a certain habitat
- GIS based analysis can help with the identification of potential threats

The project is funded by:

- € Office of the State Government of Upper Austria, Section for Environmental Protection
- € European Union

