

The River Mur in Austria/Styria

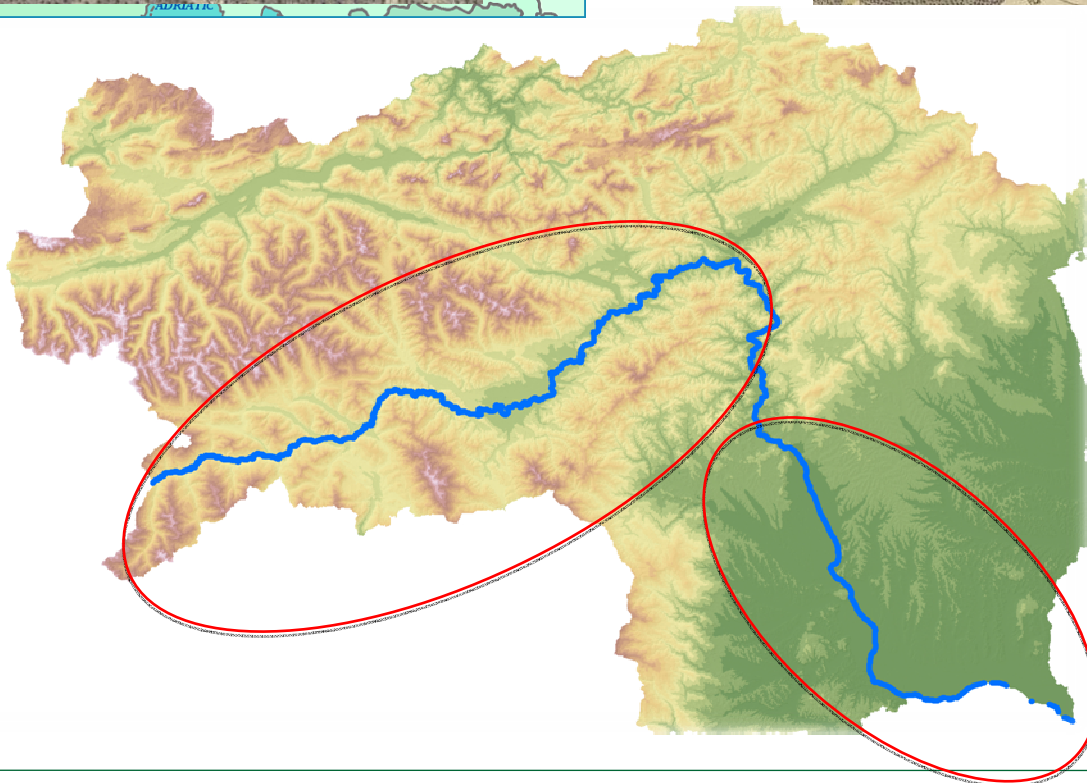
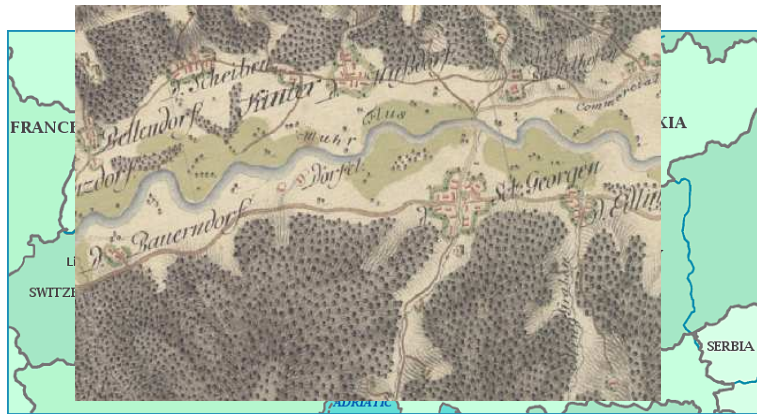


Finalist 2014

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Co-authors: J. Raderbauer, T. Wimmer, U. Dorau



Orientation



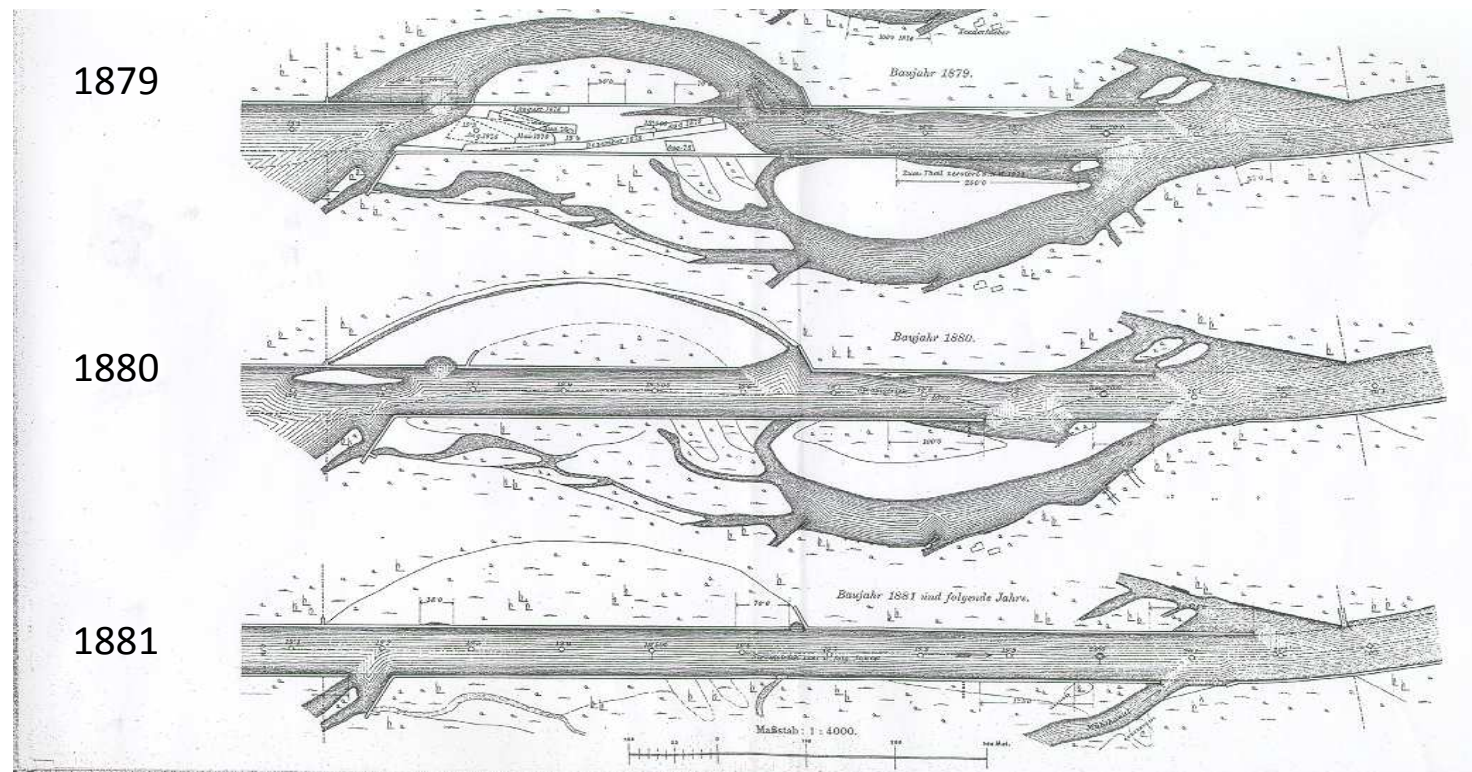
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River Mur - historically

19th century:

- ☐ Systematic regulation
- ☐ Distributaries cut off in order to intensify agricultural use



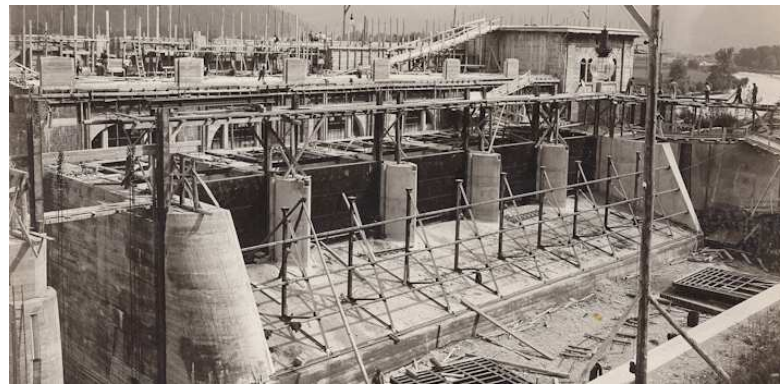
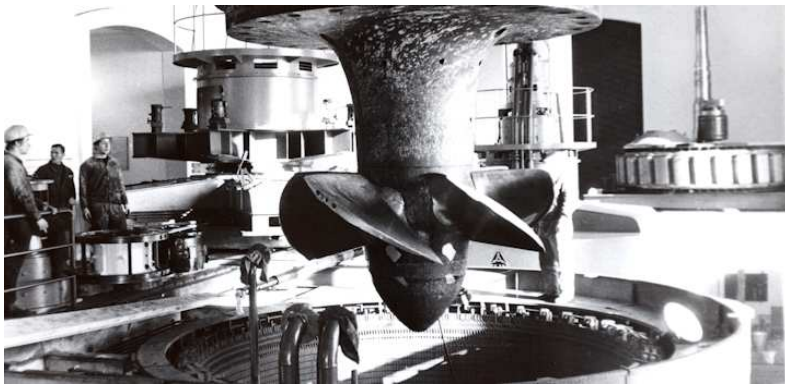
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River Mur - historically

20th century:

□ Expansion of hydropower plants

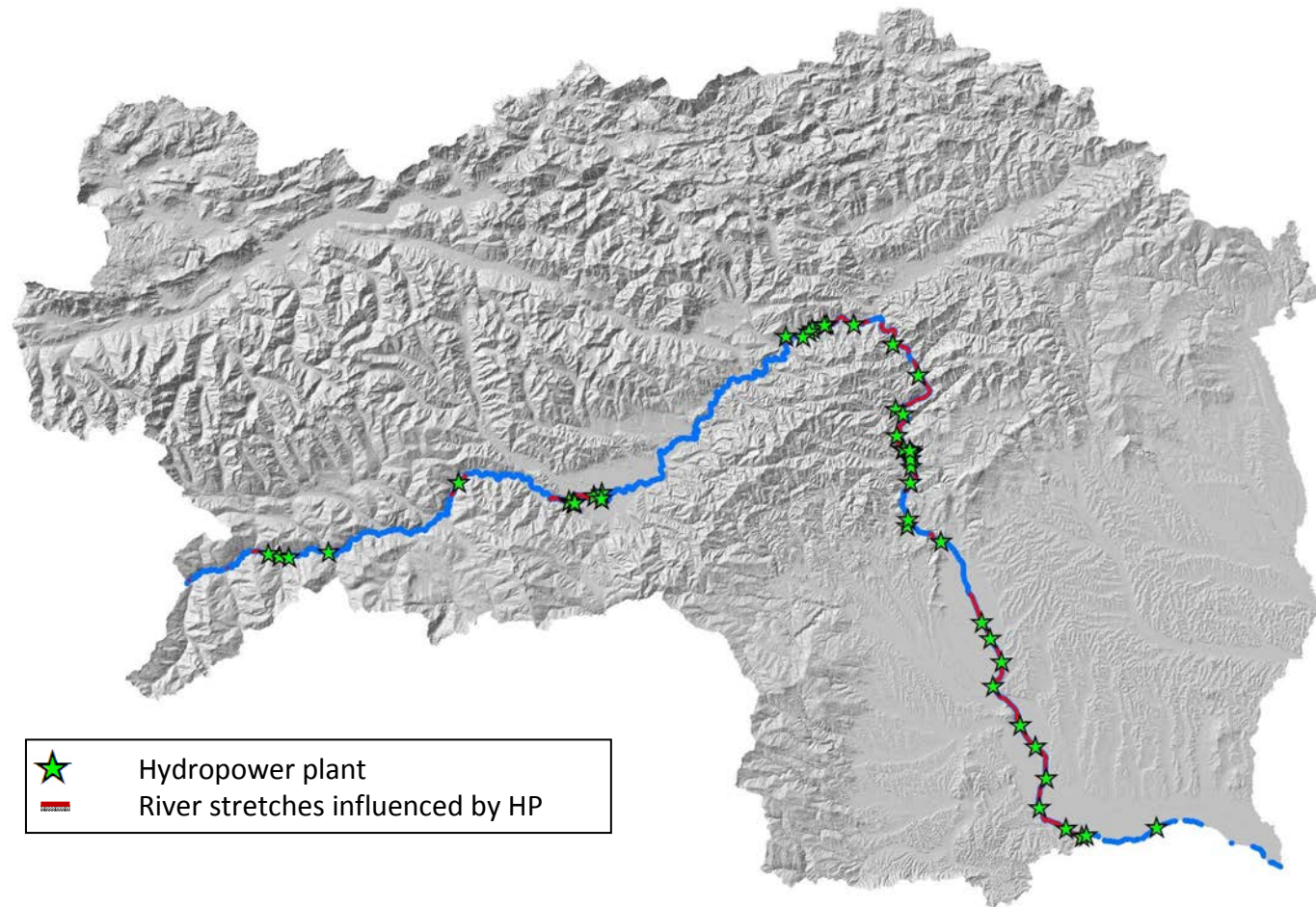


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River Mur - historically

River stretches influenced by hydropower plants (2013)



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River Mur - historically

1960s and 1970s :

- Chemical contamination: wastewater of industrial plants and communes
- River Mur considered as one of the dirtiest rivers in Europe



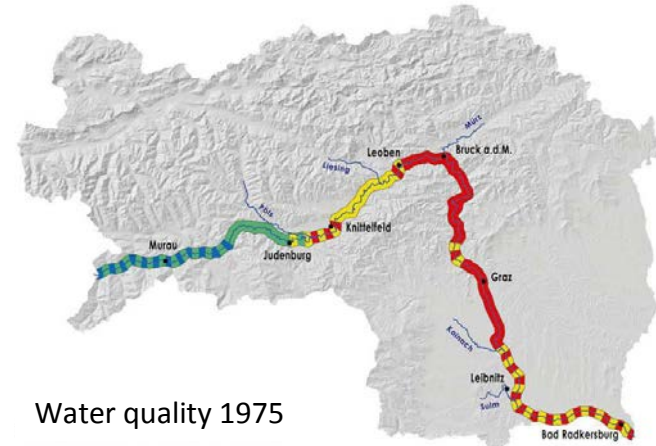
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River Mur – historically

Situation in the early 1980s:

- ☐ People were driven away from the river
- ☐ Situation became unbearable



Water quality 1975

What happened?

- ☐ Programmes for ecological regeneration
- ☐ Measures aiming for public awareness
- ☐ First trends towards nature-orientated river engineering
- ☐ Cross-boarder communication

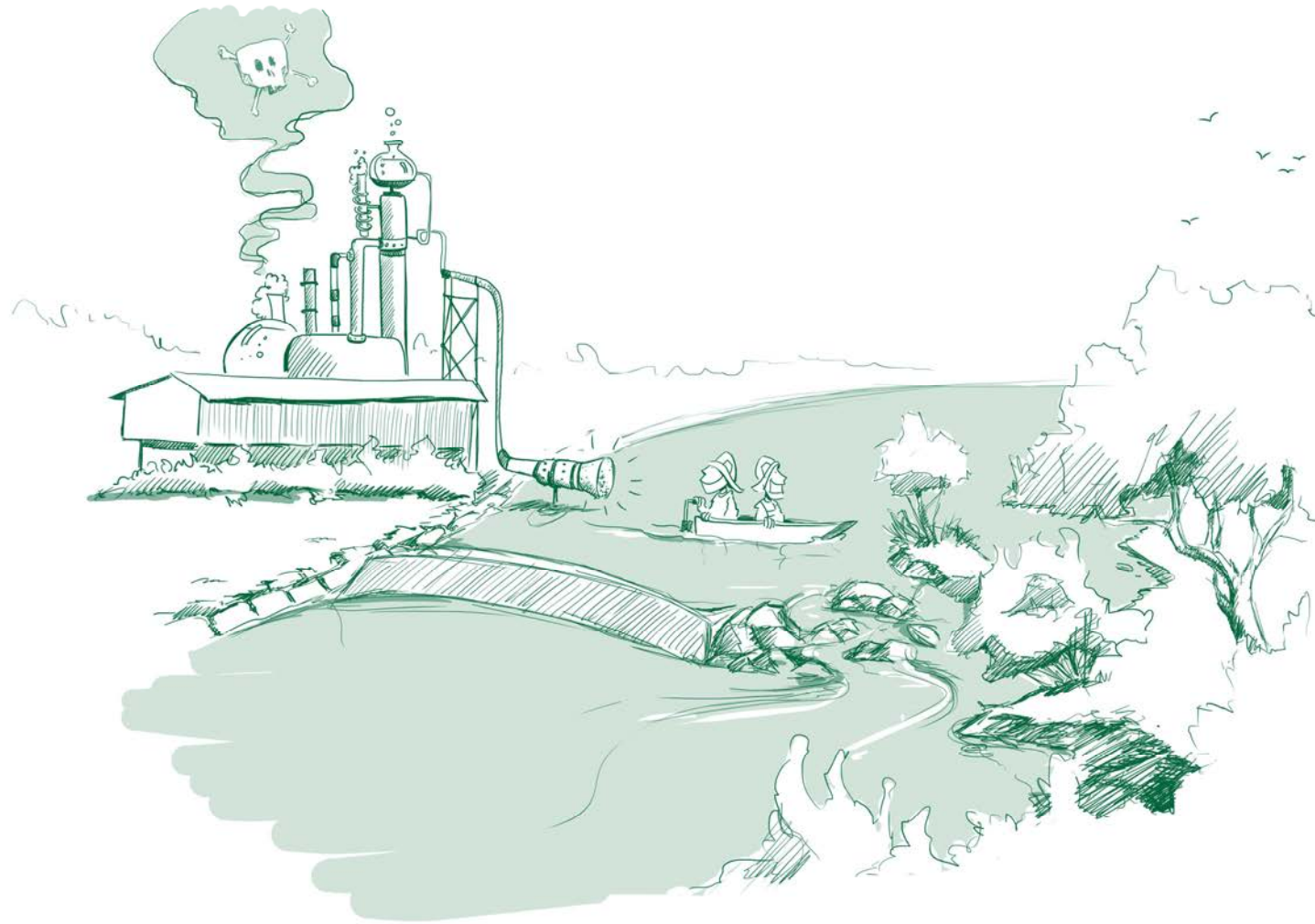


Water quality 2005

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River Mur – big chances, big challenges



heading for new shores

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River Mur – big chances, big challenges

Timeline of changes

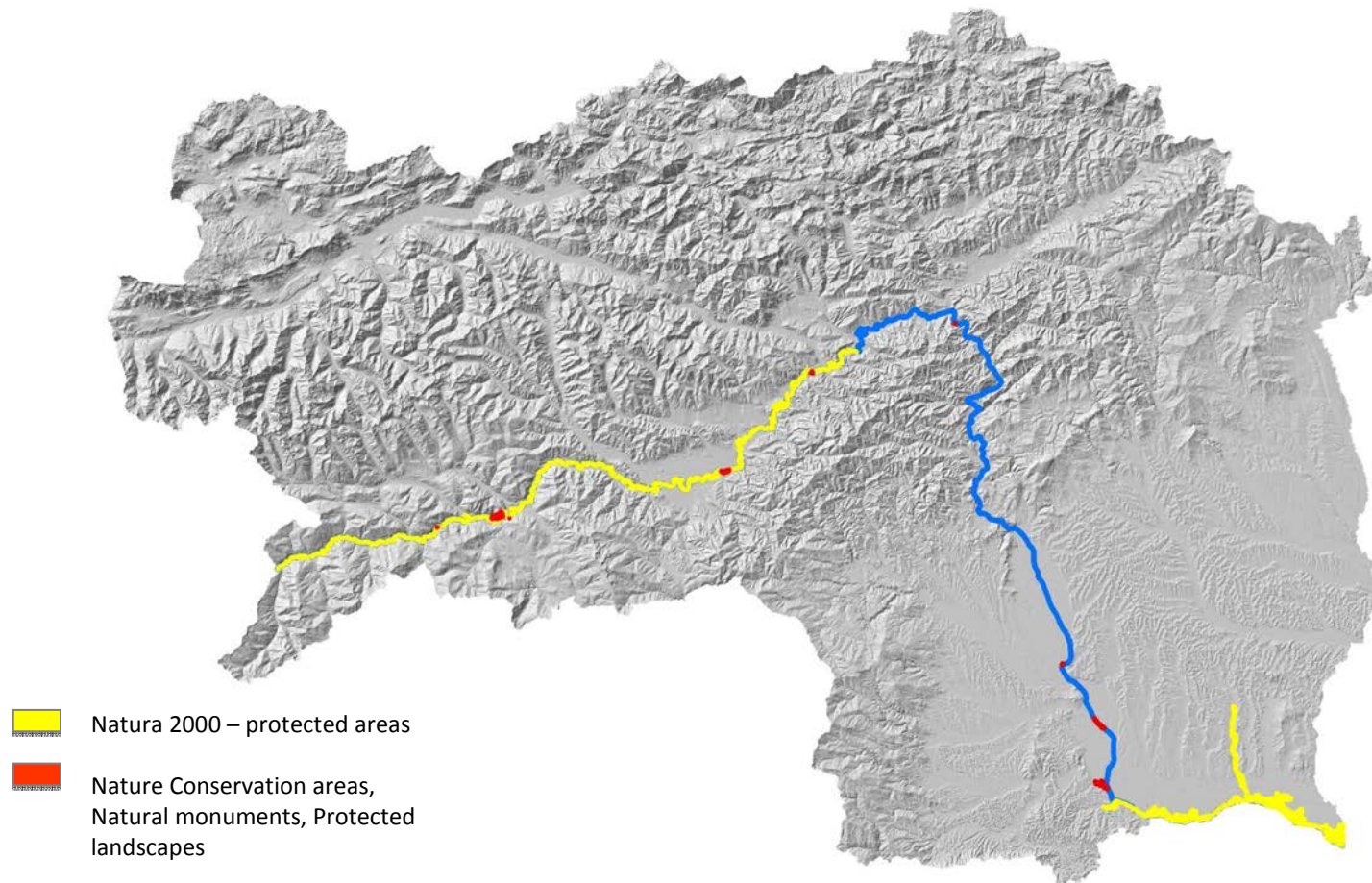
- ☐ 1983: Declaration of „Puxer Auwald“ to a **nature reserve**
- ☐ 1983: Declaration of „Murinsel Triebendorf“ to a **nature reserve**
- ☐ 1992: Establishment of the **Bilateral River Commission**
- ☐ 1998: Designation of the Upper Mur as **nationally significant river course** (WWF)
- ☐ 1998: Designation of the Upper Mur as **NATURA 2000** area
- ☐ 1995 – 1999: **Interreg IIA** „Maßnahmen Unteres Murtal“
- ☐ 2005: Designation of the Lower Mur as **NATURA 2000** area
- ☐ 2003 – 2007: **LIFE III** – Projekt „Inner-Alpine river basin management – Upper River Mur“
- ☐ 2003 – 2008: **Interreg IIIa** Project "Maßnahmen Unteres Murtal"
- ☐ 2010 – 2015: **LIFE +** – Projekt „Inner-Alpine river basin management – Upper River Mur
- ☐ 2014: Strategic river management for considerations in the power and water management sector in Styria/Austria

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River Mur – New prospects for ecology

Large scale designations as protective areas



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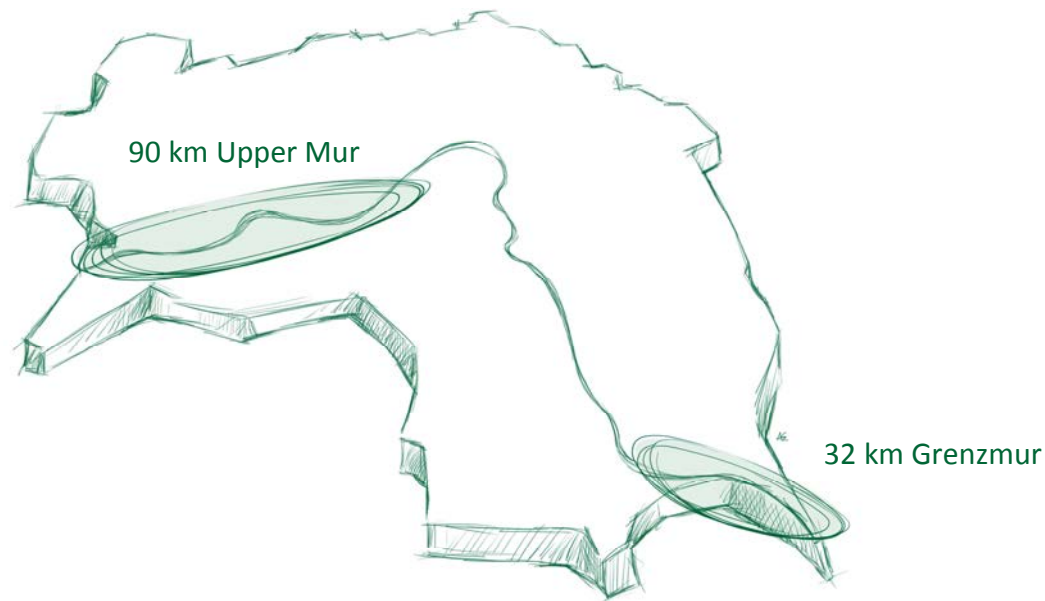
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River Mur – New prospects for ecology

EU -funded river restauration projects

Large scale river-projects started:

- ☐ Public and EU-funded
- ☐ For improving ecological situation and the public awareness
- ☐ In accordance with the objectives set in the EU Habitats Directive and the EU Water Framework Directive (WFD)
- ☐ Along a 90 km stretch of river along the Upper Mur
- ☐ Along a 32km stretch of river along the „Grenzmur“

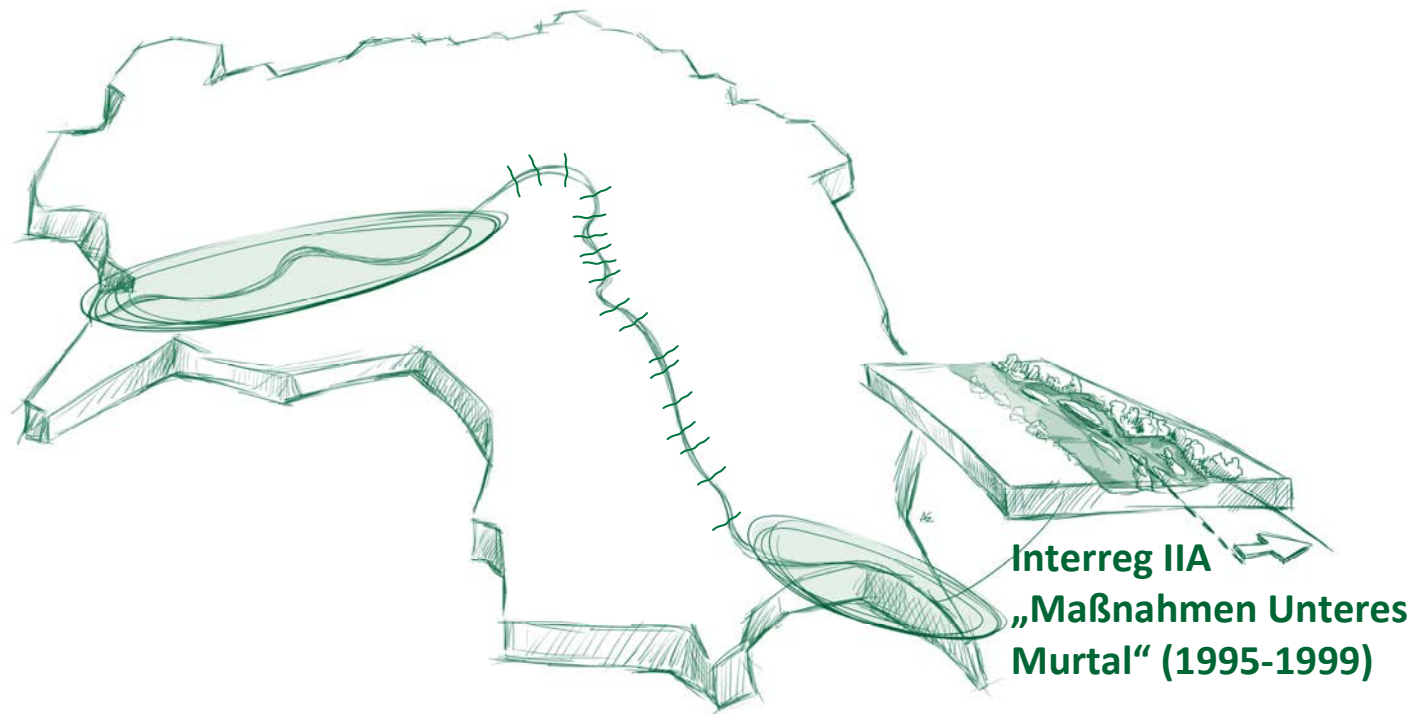


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River Mur – New prospects for ecology

EU -funded river restoration projects

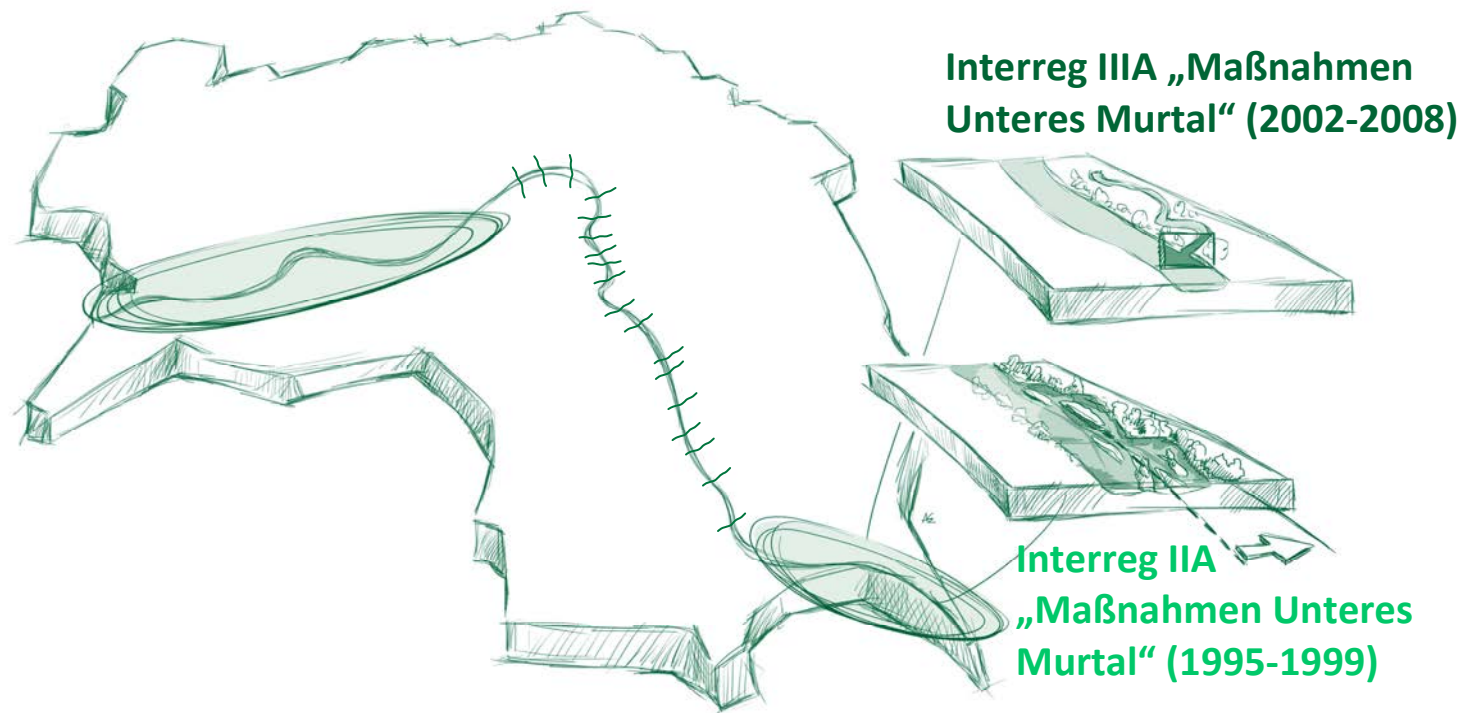


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River Mur – New prospects for ecology

EU -funded river restoration projects



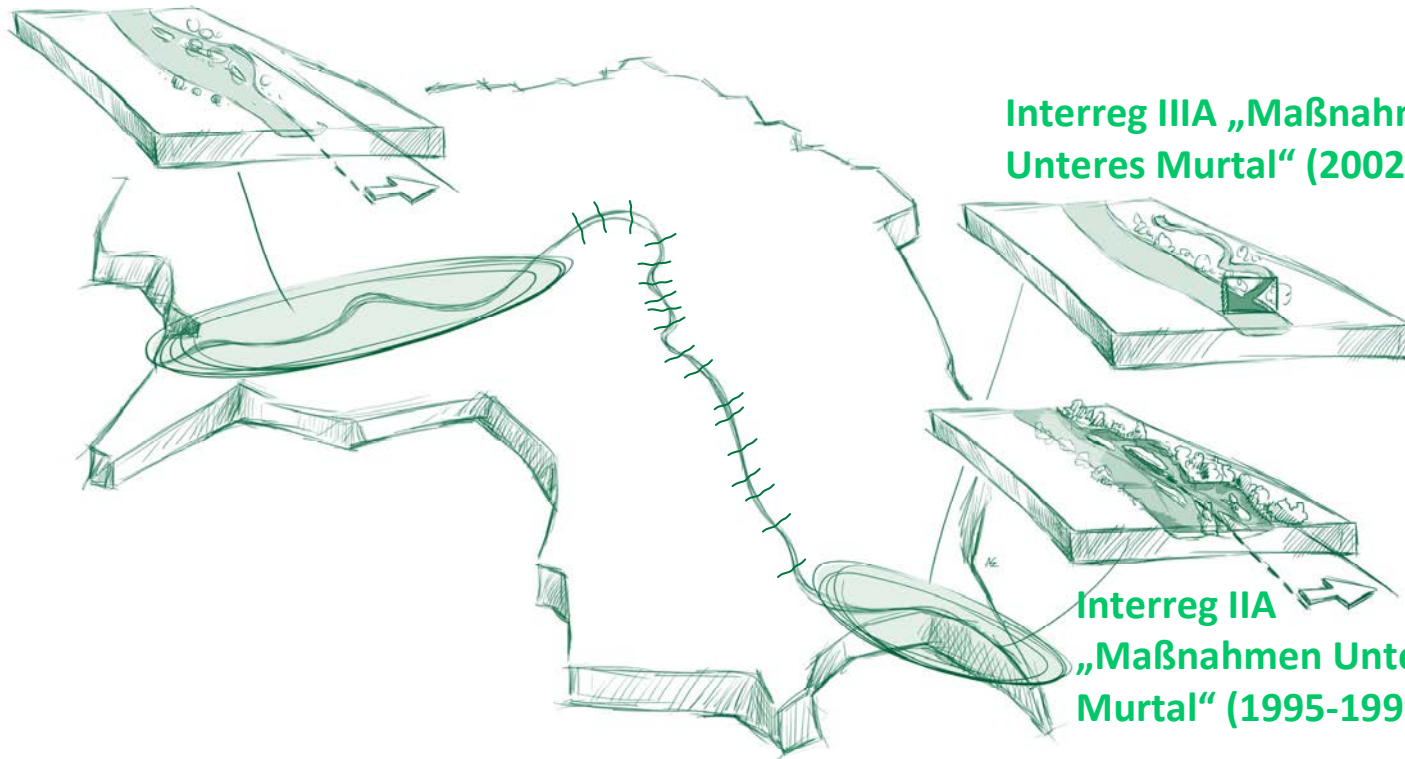
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River Mur – New prospects for ecology

EU -funded river restoration projects

LIFE Natur
„murerleben“
(2003-2007)



Interreg IIIA „Maßnahmen
Unteres Murtal“ (2002-2008)

Interreg IIA
„Maßnahmen Unteres
Murtal“ (1995-1999)

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River Mur – New prospects for ecology

EU -funded river restoration projects

LIFE Natur
„murerleben“
(2003-2007)

ETZ Dra-Mur-Ci
Grenzmur (2009-2013)

Interreg IIIA „Maßnahmen
Unteres Murtal“ (2002-2008)

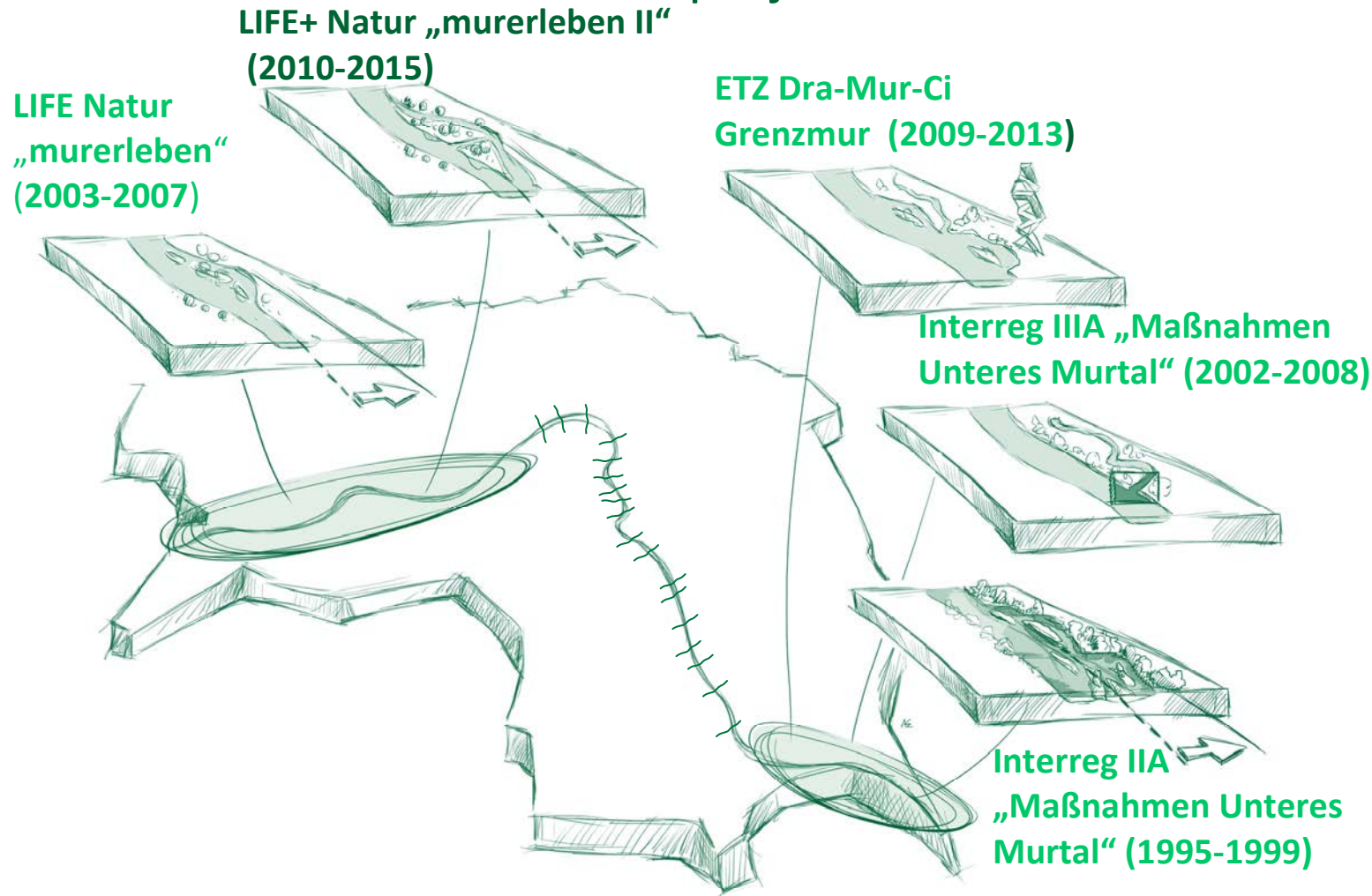
Interreg IIA
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River Mur – New prospects for ecology

EU -funded river restoration projects



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River Mur – New prospects for ecology

New targets

Targets of the renaturation projects:

- ☐ Restoration of typical hydromorphological structures
- ☐ Initiation of dynamic processes by building and reconnecting distributaries and widenings
- ☐ Stabilization of the river bed, improvement of the bed-load balance
- ☐ Restoration and improvement of a variety of aquatic and terrestrial habitats
- ☐ Protection of the last existing and initiate new alluvial forests
- ☐ Creation of space for flooding areas (passive flood protection)
- ☐ Growing awareness for environmental aspects in the public

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River Mur – New prospects for ecology

Involvement of Stakeholder

Close cooperation with the stakeholders

- ☐ economic water usage
- ☐ energy sector
- ☐ nature conservation
- ☐ mountain torrent and avalanche control
- ☐ Municipalities
- ☐ owner of fishingrights
- ☐ the public

Technical and scientific support

- ☐ various planners
- ☐ Universities

Cross-border cooperation

- ☐ coordinated in a bilateral river commission

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River Mur - New prospects for ecology

Management indicator habitats

Alder-Ashes-Floodplain forest (*Alnus glutinosa* and *Fraxinus excelsior*)



Alpine rivers and their ligneous vegetation with bitter willows (*Salix elaeagnos*)



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River Mur - New prospects for ecology

Management indicator habitats

Italian crested newt, yellow-bellied toad, river mussels
(*Triturus cristatus*), (*Bombina variegata*), (*Unionidae*)



Ukrainian brook lamprey, bullhead, Danube salmon
(*Eudontomyzon mariae*), (*Cottus gobio*), (*hucho hucho*)



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River Mur - New prospects for ecology

Management indicator habitats

Common Kingfisher, Grey-headed Woodpecker, Little Crake
(*Alcedo atthis*), (*Picus canus*), (*Porzana parva*)



Black Stork, Common Sandpiper, Little Ringed Plover
(*Ciconia nigra*), (*Actitis hypoleucos*), (*Charadrius dubius*)



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River Mur – New prospects for ecology

Main renaturation measures

- ☐ removal of the impassable migratory barriers
or building of fish passes
- ☐ removal of the bank protection to start dynamic processes
- ☐ creation of branches, reconnection of oxbows and tributaries
- ☐ different research projects to analyse the bed load balance
- ☐ assurance of existing habitats and creation of lost habitats

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River Mur – New prospects for ecology

Project „Weyern“ 2006



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River Mur – New prospects for ecology

Project „Lässer Au“ 2014



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River Mur – New prospects for ecology

Project „St. Peter“ 2006 and 2014/2015



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River Mur – New prospects for ecology

Project „Gosdorf“ 2006



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River Mur – New prospects for ecology

Project „Sicheldorf“ 2012



Test widening 04/08

Construction phase 05/12

Development
after flooding 07/12

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River Mur – New prospects for ecology

Project „Sicheldorf“ 2012

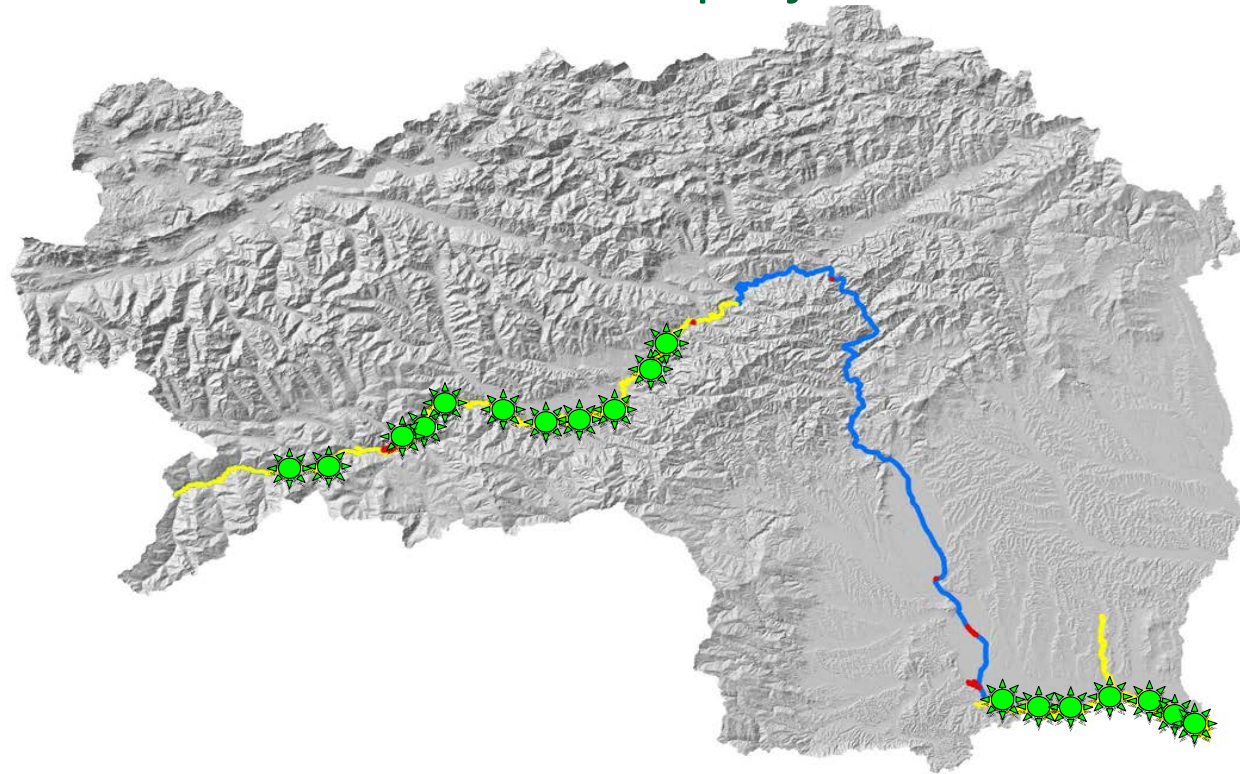


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River Mur – New prospects for ecology

EU -funded river restauration projects



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Summary of activities (Life, Life +, Interreg II & IIIa, ETZ Dramurci):

- ☐ 28 measures
- ☐ 21 km affected by restauration projects
- ☐ 12,5 mio. € total invesment sum

River Mur – Results of renaturation

Monitoring

☐ Monitoring results - fish ecology

- ☐ the newly created habitats are accepted by many juvenile fish and there are even more demanding species
- ☐ high ecological potential is still there



☐ Monitoring results – amphibians

- ☐ Measures are rated very positively for the development of the amphibian fauna
- ☐ it can be assumed with a high degree of probability that they will serve as spawning grounds and even permanent habitat for amphibians



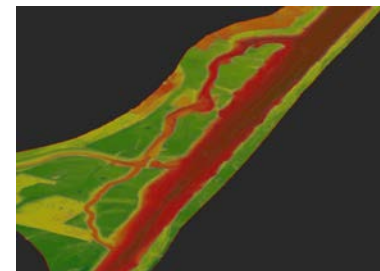
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River Mur – Results of renaturation

Monitoring

- ☐ Monitoring results - vegetation
 - ☐ the hydrologic regime in the floodplains was improved and directed towards the original state
 - ☐ suitable conditions for rejuvenation for the riparian vegetation
 - ☐ invasive species - management
- ☐ Monitoring results – bed load
 - ☐ The bed level within the restored reach has been raised
 - ☐ the observed riverbank erosion indicates further widening



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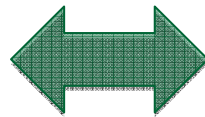
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River Mur – developing new management plans

New challenges

**Need for more
ecological improvement**

*(EU Water Framework Directive,
National laws)*



**New hydropower plants necessary
to increase renewable energy
production**

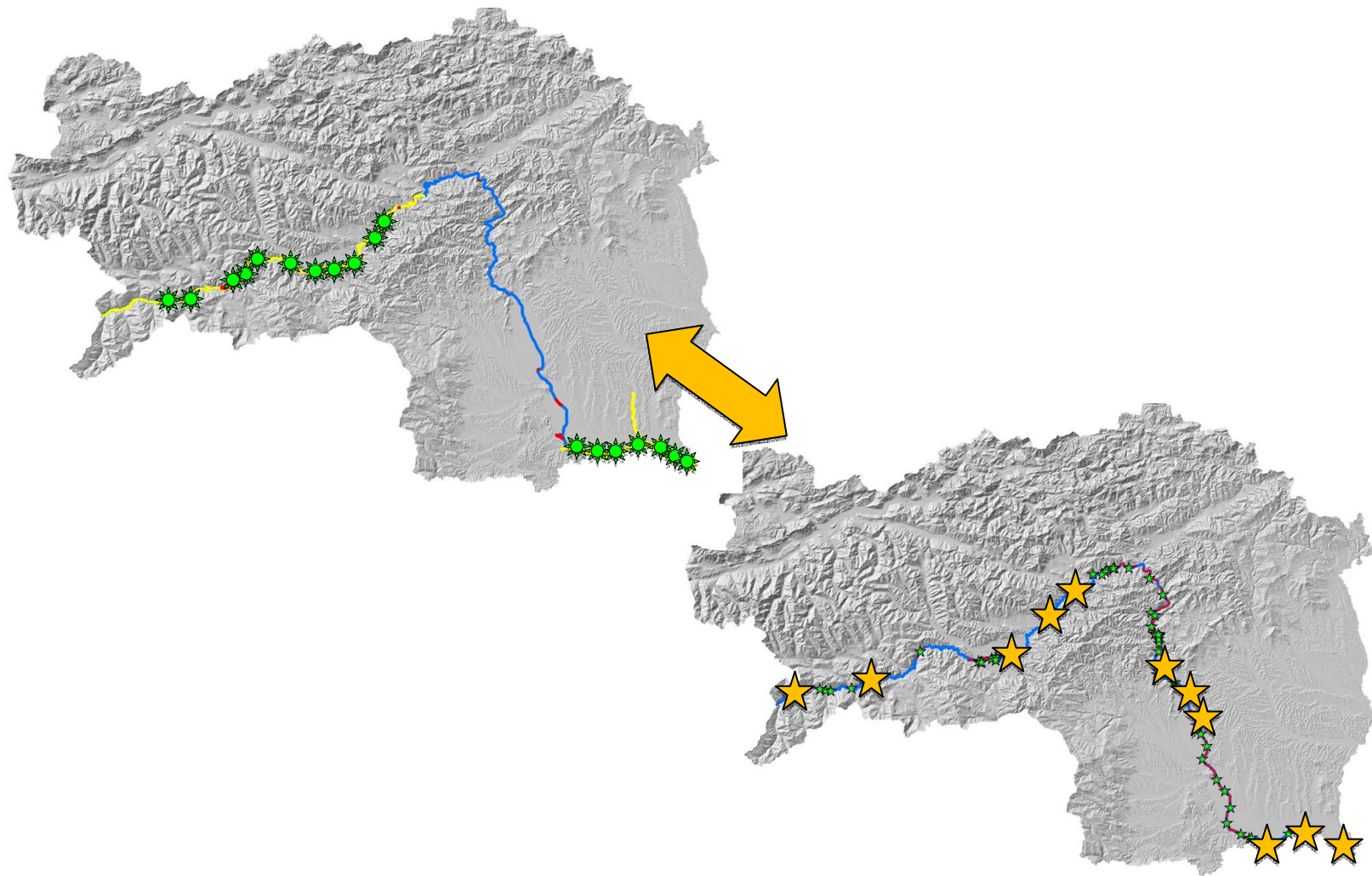
(EU Renewable Energy Directive, National laws)



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River Mur – developing new management plans



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River Mur – developing new management plans

To overcome the conflict between hydropower expansion and nature protection, a management plan has been established for the River Mur:

The plan has been aligned between

□ energy providers and river experts

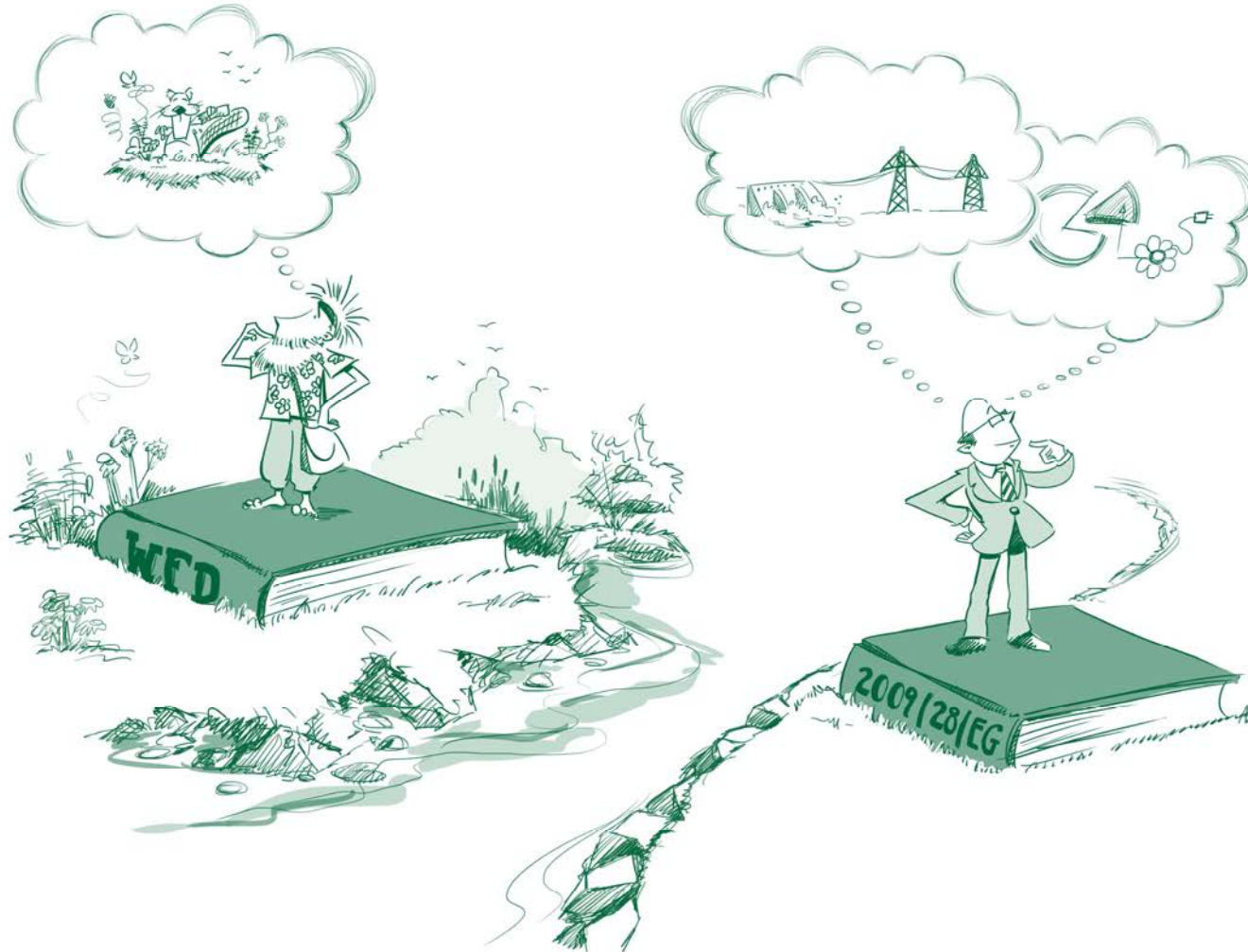
The core is

□ to balance the interests of the energy sector and those of river protection and restoration, focussing on river-ecological aspects

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River Mur – developing new management plans



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River Mur – developing new management plans

Classification of river sections:



Ecological priority zones

- ☐ Environmentally sensitive water bodies
- ☐ Preservation and improvement of the ecological state has priority
- ☐ No hydropower development

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River Mur – developing new management plans

Classification of river sections:



Trade-off zones

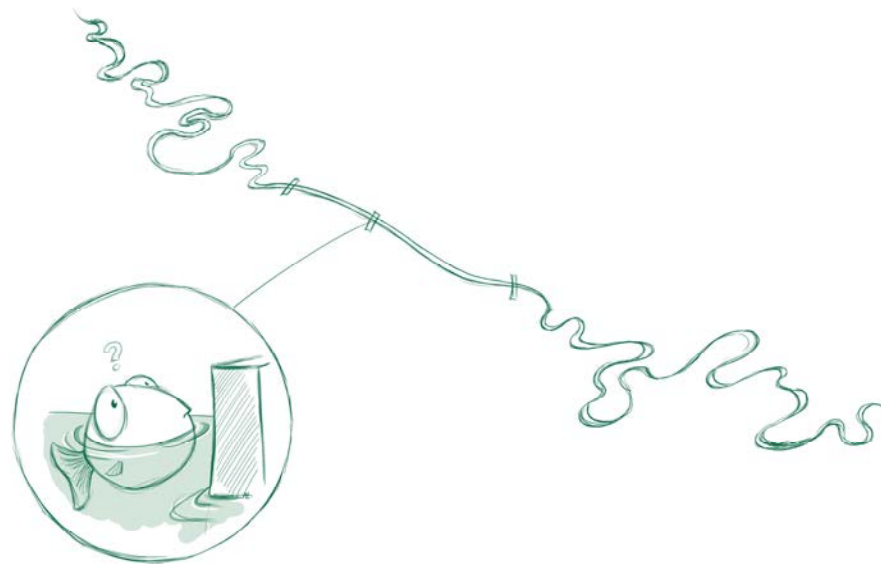
- ☐ Stretches of good ecological value
- ☐ High hydropower potential
- ☐ Hydropower plants only possible if environmental compatible
- ☐ Hydropower development only possible if no ecological deterioration is caused (alterations allowed only within a „state class“)

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River Mur – developing new management plans

Classification of river sections:



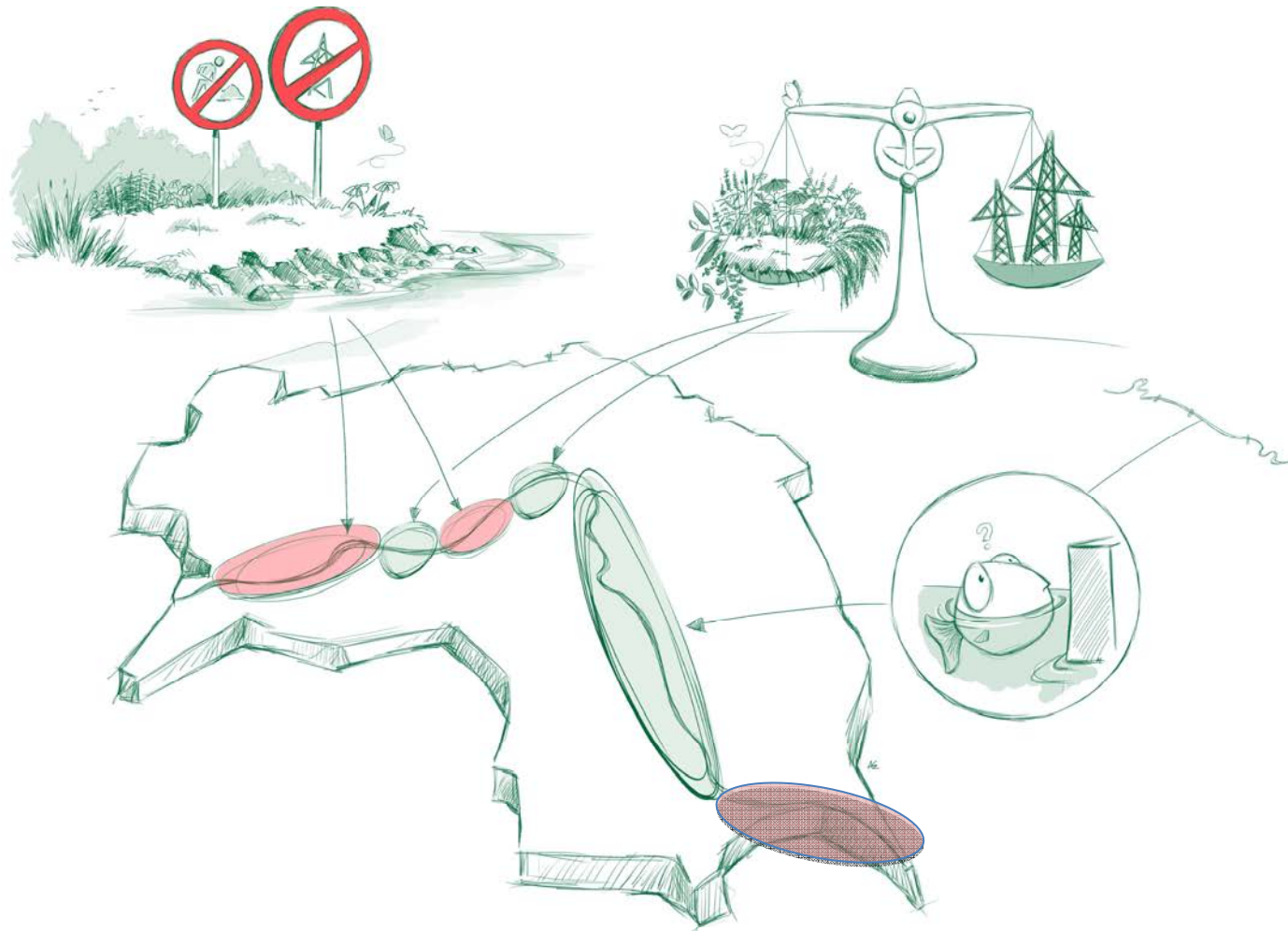
Zones of no particular designation

- ☐ No ecological sensitivity
- ☐ Low hydropower potential
- ☐ Mostly affecting river stretches already used for hydropower purposes (often “Heavily modified water bodies”)

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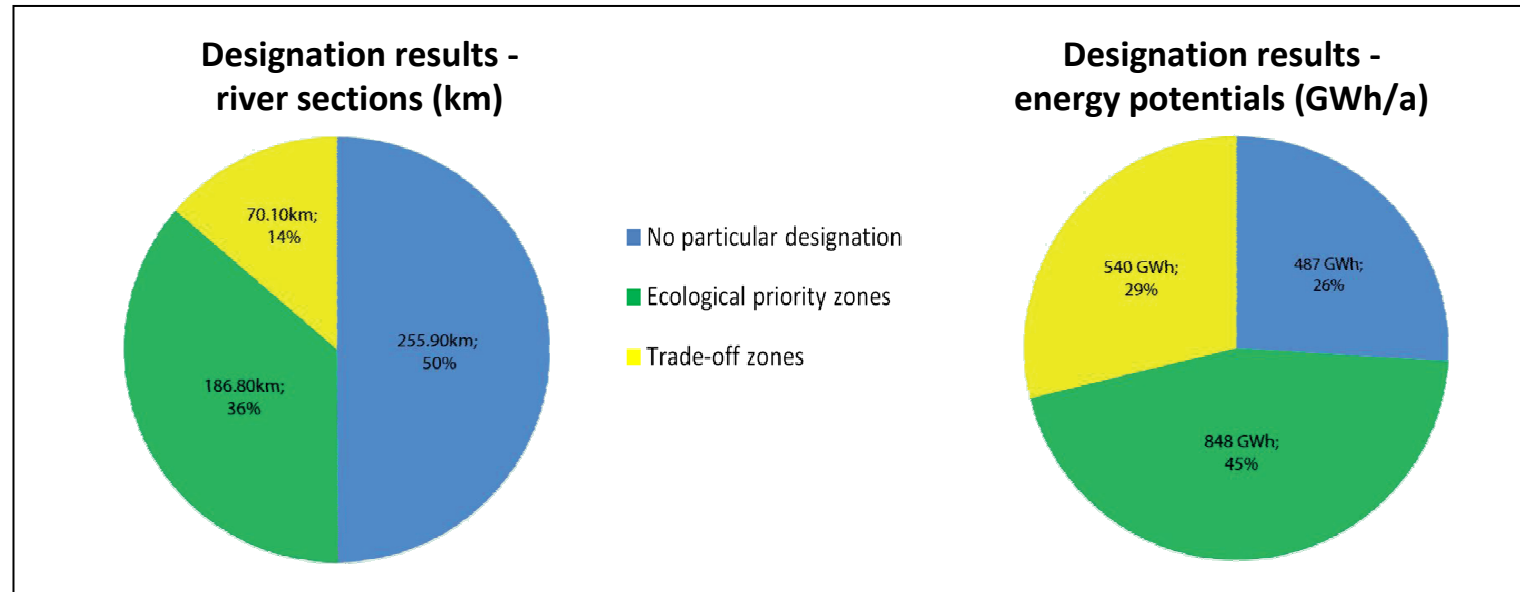
River Mur – developing new management plans



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River Mur – developing new management plans



- Trade-off zones and ecological priority zones have high energy potentials (74%), but make up only 50 % in terms of length
- 50% of the Mur protected from ecological deterioration to an inferior state class
- Future plans for hydropower plants most likely to happen in trade-off zones (highest energy potential), but planning has to be environmentally compatible
- Legal basis for the designations: Regional programmes - valid until 2022

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River Mur –

Conclusion and Outlook

- The individual restoration measures enabled
 - the reconstruction of lost habitats in some areas
 - the reactivation of retention areas for flood drainage
 - the ensuring of the ecological status

 - The management plan enabled
 - the unification of different interests of the EU Water Framework Directive, the EU Flood Directive and the Renewable Energy Directive
 - the foundations to comply with the mandatory energy targets, while maintaining/improving the ecological status
- ⇒ valid until 2022

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River Mur –

Conclusion and Outlook

- ☐ Implementation of measures is most successful, if there is a well planned information basis provided for the public

- ☐ to make decisions understandable and transparent
- ☐ to shorten approval and implementation of projects
- ☐ to create environmental awareness
- ☐ to bring the population back to nature
- ☐ to invite the population to use nature as a living-, leisure- and recreation space

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River Mur – Public relations

School projects, competitions and scientific classes



Press conferences, festivals and sporty activities



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River Mur – Investing of the PrizeMoney

The main vision is

- ☐ to invest in public information provision and the participatory planning processes

Further projects in order to engage public participation could be:

- ☐ the initiation of annual public workshops in the communes - here new projects and ideas could be presented and discussed with local population
- ☐ the expansion of the visitor guidance
- ☐ a campaign for improving the public sensitivity towards Natura 2000
- ☐ the complementation of the already implemented stepping stones

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Thank you
for your attention!

River Mur – developing new management plans

Background



EU Habitats directive



EU WFD

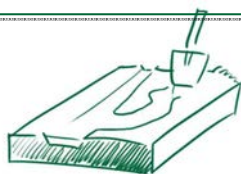


Nature protection laws

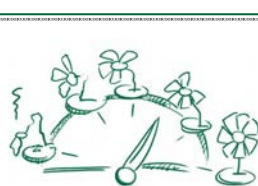


EU Renewable Energy directive

Criteria



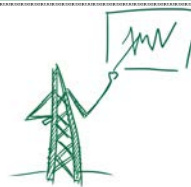
Ecological measures



Current state



Nature conservation area

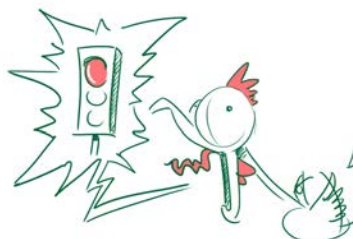


Hydropower potential



Energy aims

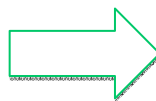
Sensitivity assessment



High sensitivity



Medium/low sensitivity



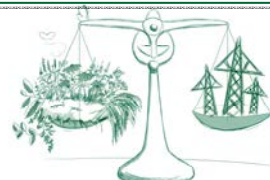
Negotiation Process



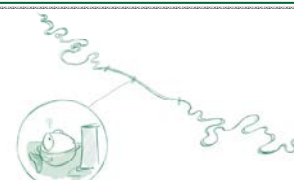
Results



Ecological priority zones



Trade-off zones



No particular designation

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