European River Restoration Conference

Featuring the IRF Riverprize

Celebrating Successes and Addressing Challenges 5th edition | 11-13 September 2013 | Vienna















**SESSION** 

PROVINZ

**CONVERTING POLICY INTO ACTION: FROM COMMUNITY ENGAGEMENT TO STAKEHOLDERS** COMMITMENT

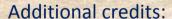


**SEE RIVER PROJECT** 

HAND IN HAND **FOR RIVERS** 

WWW.SEE-RIVER.NET

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Andrea Nardini – International Advisor on Water Mangement

Gianluca Vignoli - CISMA

Francesco Comiti – Free University of Bolzano



SEE River



### **Contents**

I) Cross – sectoral cooperation and visualization: Systems understanding is the nexus!

The model-based river corridor planning process
The river corridor vision alignment model

II) Visualization of the Drava River Corridor "Leitbild" in Italy

Documented objectives in written form (result of the Pro Drava Project)
Perception Alignment Problem
Leitbild: Visualization approach

III) Application Example

Drava River Stretch between San Candido and Versiaco

**IV) Conclusions** 







#### Cross – sectoral cooperation and visualization: Systems understanding is the nexus! The model-based river corridor planning process " Anticipated" River Corridor Creation Problem Solving in the "Concerned Society" in Prototype Space conjunction with the "Representative Steering Panel" " Anticipated Feedback CVChoice Opinion polls Experiments Experiments **Decision Space - Dimensions** for Decisions Legal and Institutional Setting Laws / Desiderata Regulations Objective setting and weighing, Preference structures, WTP, **ROBUST MODELING** WTA, Risk acceptance, Disturbance tolerance with respect to all key objectives **Constraints Procedures Budget Restrictions**, Conjunctive and disjunctive ROBUST MONITORING Restrictions, modus operandi and mode of allocation Problem Solving in the real restrictions + River Corridor Resources **Developmental possibility** RC evolution trajectories, Ecosystem resilience, Natural Hazard Risk. "Objective" Developmental trends and opportunities Audits / Assessments / Expert Scenario based Modeling " Material" River Corridor Creation Elicitations analyses "Real World" Feedback Collaborative Expert Panel -Planning Team

### Cross – sectoral cooperation and visualization: Systems understanding is the nexus! The river corridor vision alignment model

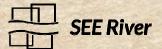
#### Recognition & Start of Public Participation (PP) 1- Diagnosis (scoping; integrated characterization; planning synopsis): with ITERATIONS problems and opportunities ONSISTENCY MATRIX Participation (PP 2- Vision and Objectives 3- Decision space: options, strategy and alternatives prototyped design 4- Evaluation: prediction of effects, measure of impacts: ഗ and integrated comparison of alternatives STEP Public | 5- Decision: negotiation and adoption **X**EΥ 6- Specifying: detailed design, implementation plan (tools, times, responsibilities, resources), monitoring plan, ... Process evaluation & approval Textual strings of argumentation, consistent formulations, protocols TA Computational architecture: target system, weighing of objectives, indicators of performance and impact Visualization: Radar plots for CS, GIS layers and maps, 2D and/or 3D renderings, CAD details for constructive elements Consistency arrows: from step to step and between textual, computational and visualized

contents

#### Visualization of the Drava River Corridor "Leitbild" in Italy

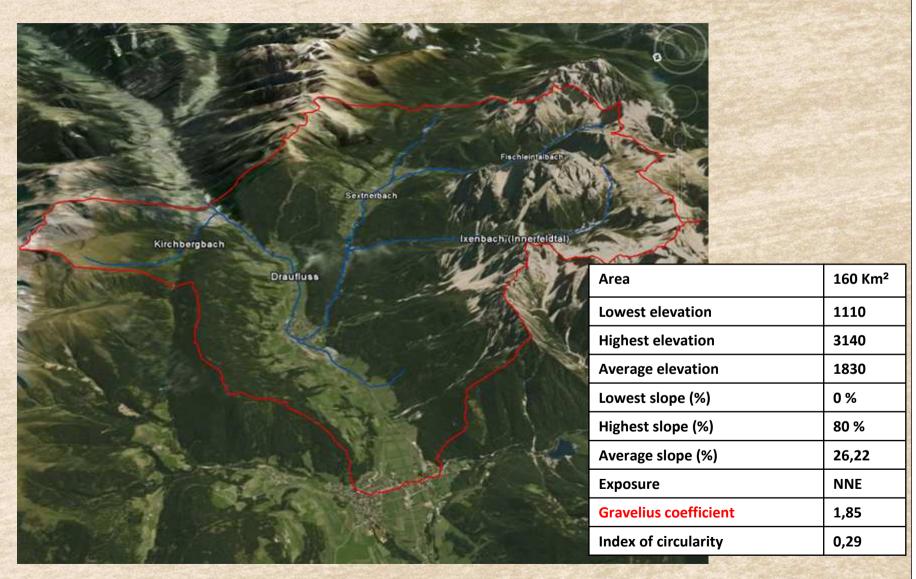
#### Documented objectives in written form (result of the Pro Drava Project)

- Integral Protection of settlement areas and infrastructural elements as well as relevant development areas against natural hazards (Floods, Debris Flows, Avalanches)
- II) Maintenance and Creation of ecologically valuable aquatic- semi-terrestrial and terrestrial habitats in the Pro Drava River catchment. Reestablishment of a good ecological status for the streams in the Pro Drava catchment
- III) Safeguarding a sustainable use of water resources in the Pro Drava catchment
- IV) Conservation and sustainable development of the Pro Drava catchment as living space, economic space and recreation area.
- V) Information and Engagement of the concerned society Information to strengthen the multiple values of the Pro Drava catchment.

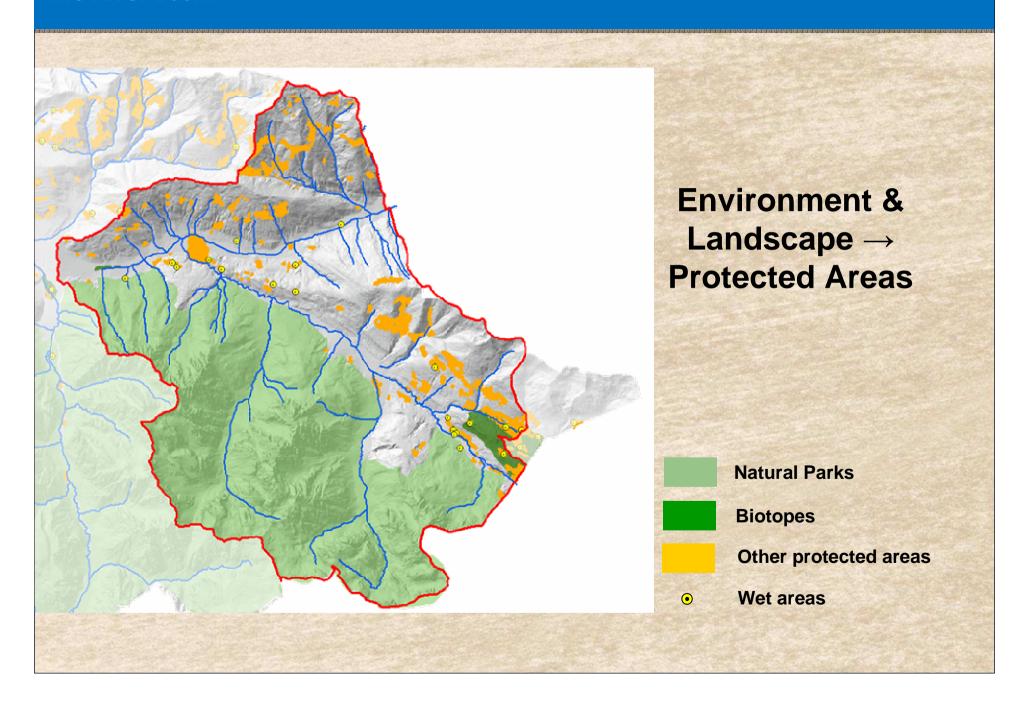


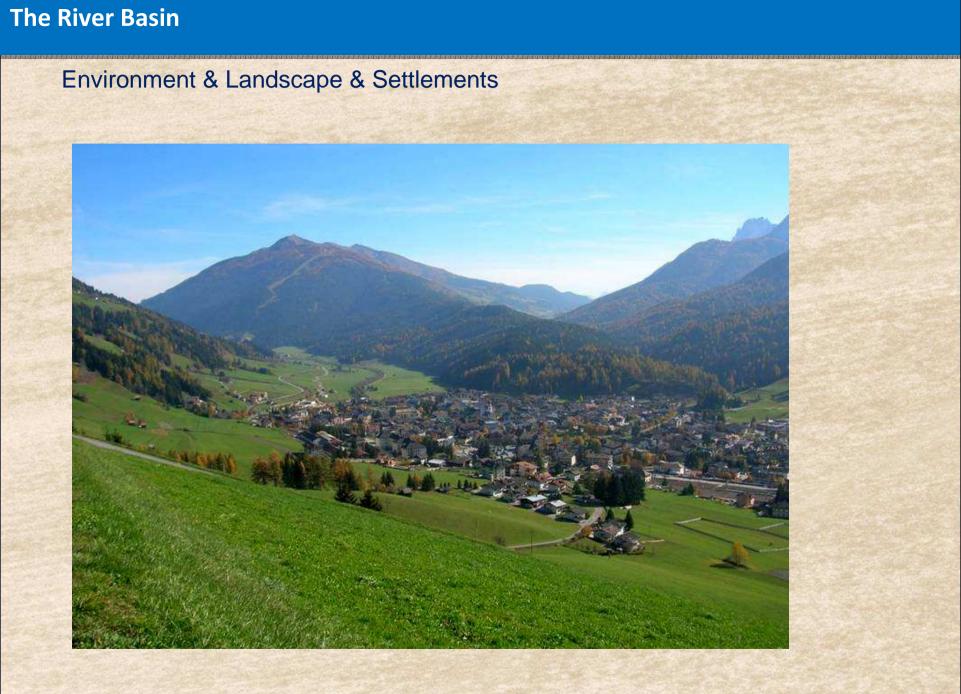
### The River basin

#### Morphology and related parameters



### **The River Basin**





### **Potential pressures**

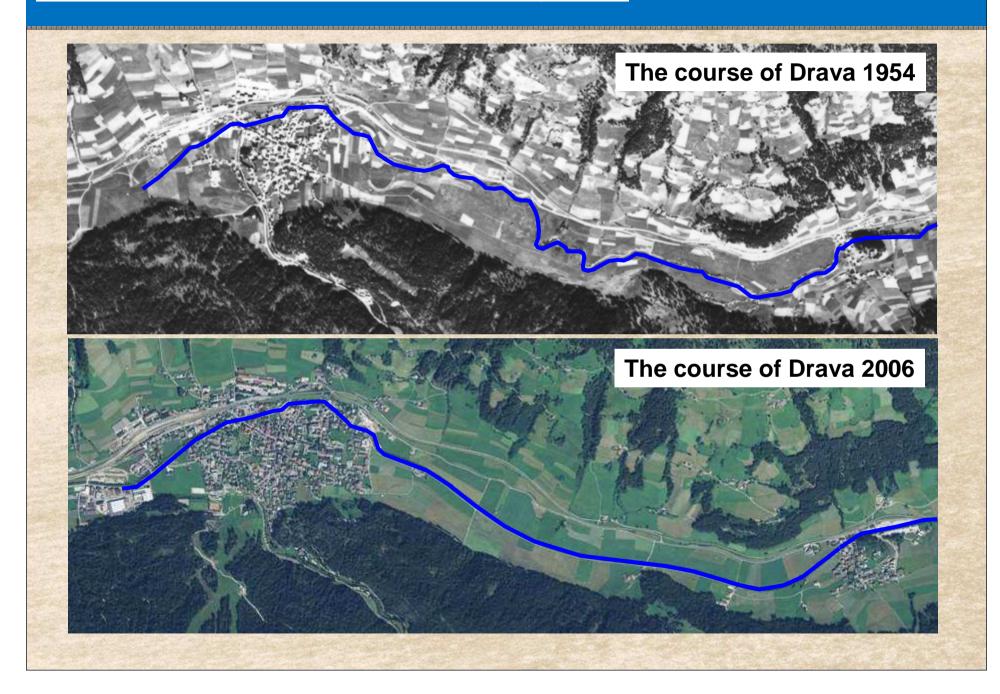


### The weight of agriculture

### **Environment & Landscape & Agriculture**

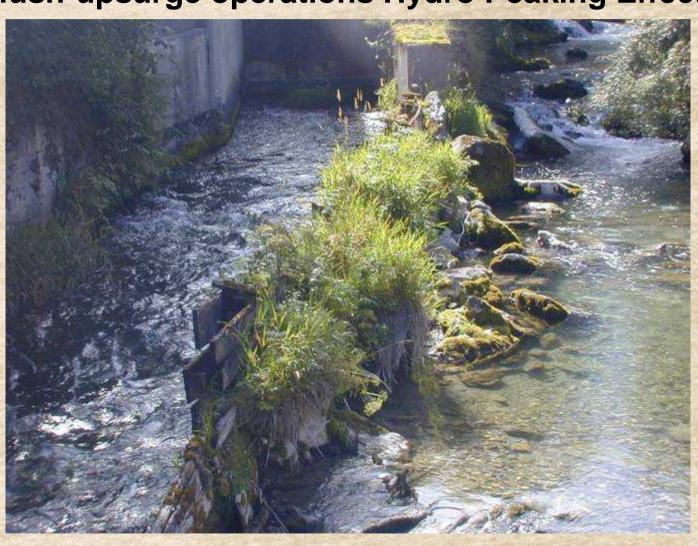


### **Drava River Corridor: a multidimensional congestion?**



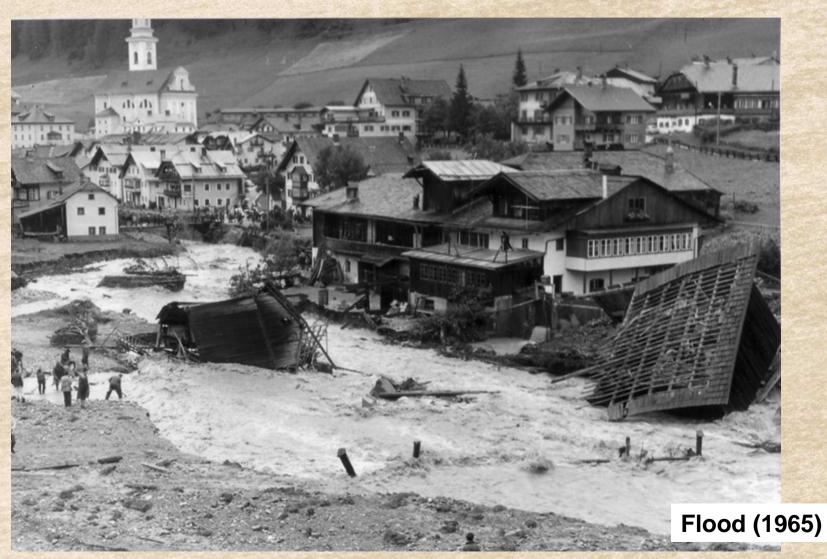
### **Drava River Corridor: a multidimensional congestion?**

### Flush-upsurge operations Hydro Peaking Effects



### **Drava River Corridor: a multidimensional congestion?**

### Water-related hazards and risks



### Visualization of the Drava River Corridor "Leitbild" in Italy

#### **Perception Alignment Problem**

- I) Conflict between objectives
- II) Problem Perception Duality: River corridor River catchment
- III) Ambiguity of language
- IV) Ambiguity of players
- V) Engagement / Objectives dichotomy

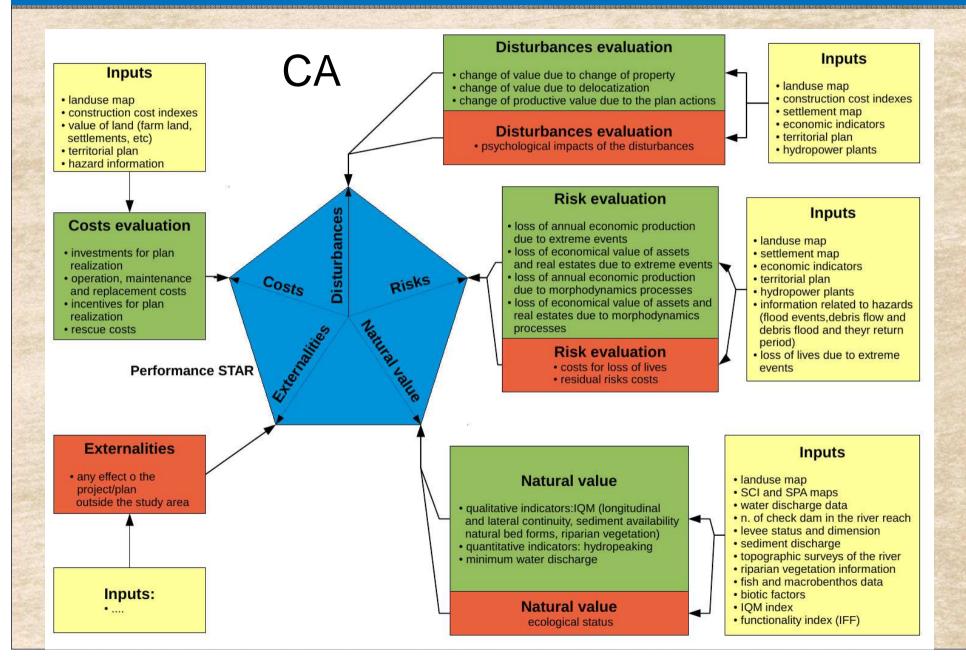
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## Visualization of the Drava River Corridor "Leitbild" in Italy The river corridor vision alignment model

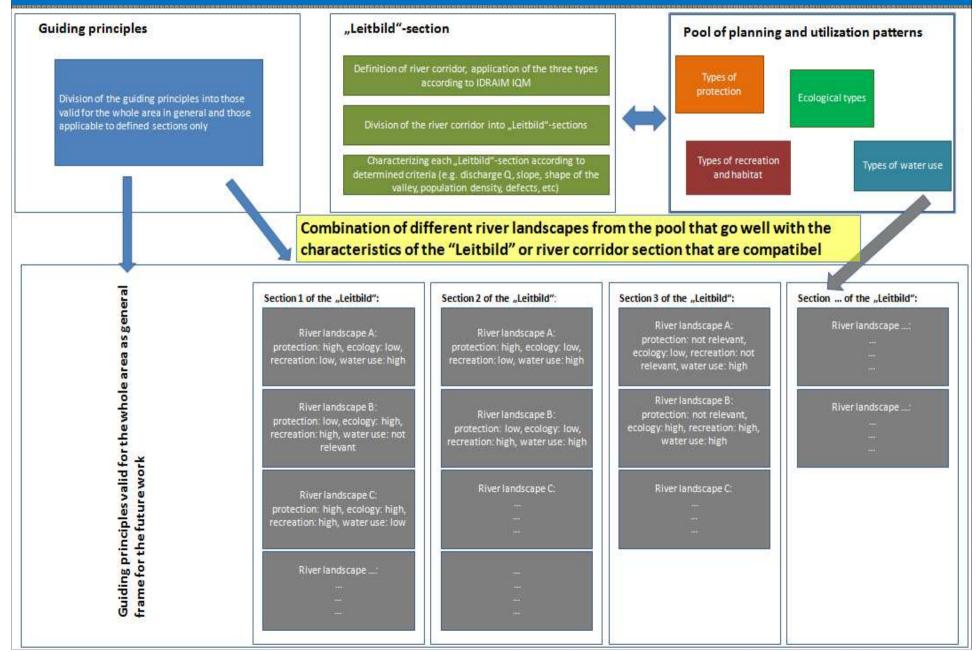
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Recognition & Start of Public Participation (PP) 1- Diagnosis (scoping; integrated characterization; planning synopsis): with ITERATIONS problems and opportunities CONSISTENCY MATRIX Participation (PP) 2- Vision and Objectives CA 3- Decision space: options, strategy and alternatives prototyped design 4- Evaluation: prediction of effects, measure of impacts: PS CA and integrated comparison of alternatives Public | STE 5- Decision: negotiation and adoption KΕΥ 6- Specifying: detailed design, implementation plan (tools, times, responsibilities, resources), monitoring plan, ... Process evaluation & approval Textual strings of argumentation, consistent formulations, protocols Computational architecture: target system, weighing of objectives, indicators of performance and impact Visualization: Radar plots for CS, GIS layers and maps, 2D and/or 3D renderings, CAD details for constructive elements Consistency arrows: from step to step and between textual, computational and visualized

## Visualization of the Drava River Corridor "Leitbild" in Italy The river corridor vision alignment model



## Visualization of the Drava River Corridor "Leitbild" in Italy The Leitbild Visualization Approach



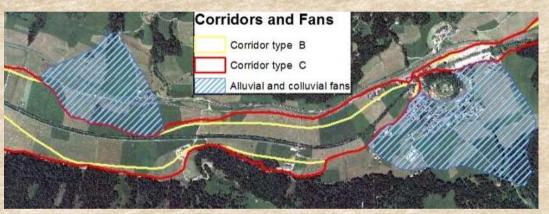
### **Application Example Drava River Stretch between San Candido and Versiaco**

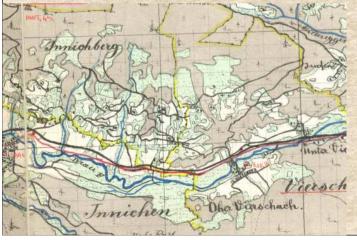


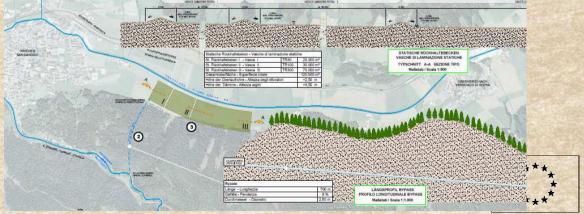


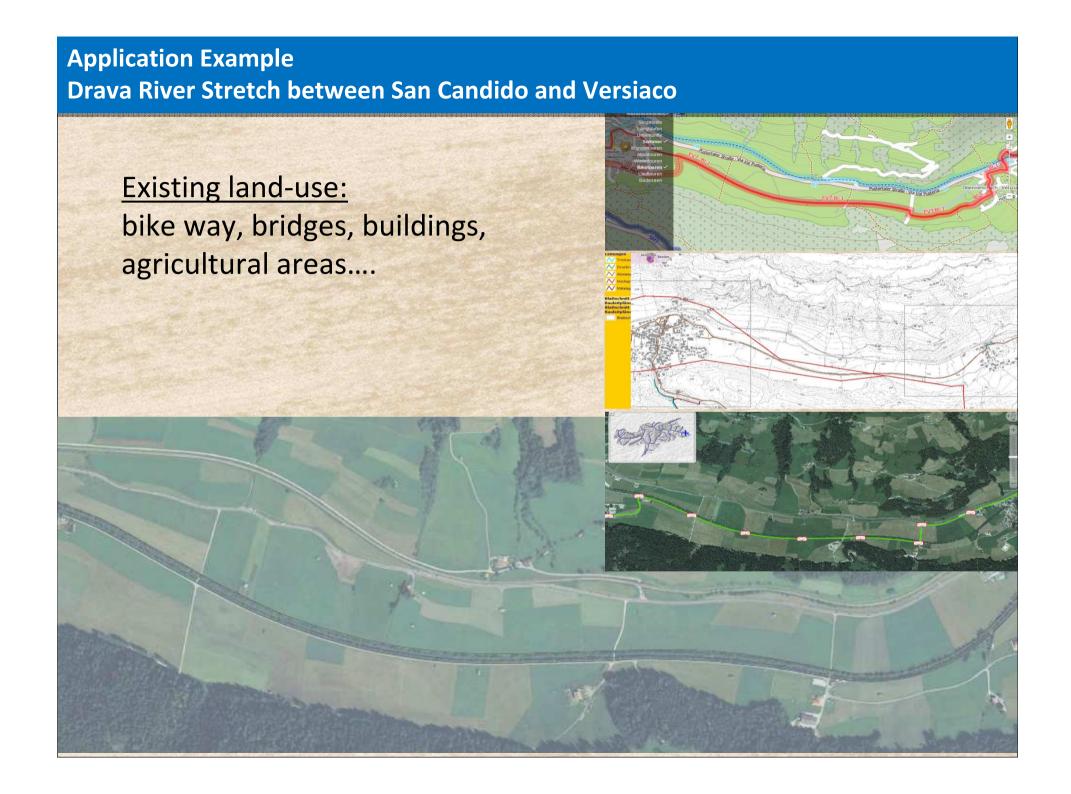
- proposal of measures
   elaborated by 3 M Engineering
- historical river course
- Bundle of measures









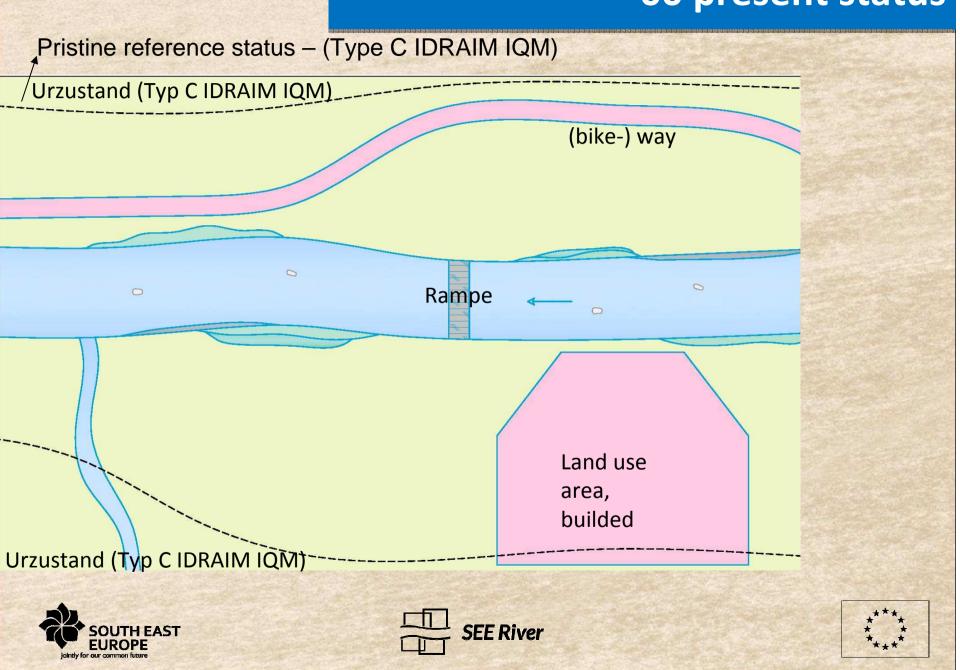


### **Application Example Drava River Stretch between San Candido and Versiaco** bypass 3 flood retention basins Statische Rückhaltebeken - Vasche di laminazione statiche VASCHE DI LAMINAZIONE STATICHE TYPSCHNITT A-A SEZIONE TIPO 30.000 m Maßetab / Soala 1:600 70,000 m Gesamtoberfläche - Superflecie totale 120,000 m Hohe der Überlauffohre - Altezza degil sflorato +2,50 m +3,50 m Höne der Dämme - Altezza argini Länge - Lunghezza Gefälle - Pendenza 8 % PROFILO LONGITUDINALE BYPASS Durchmesser - Diametro 2,50 m

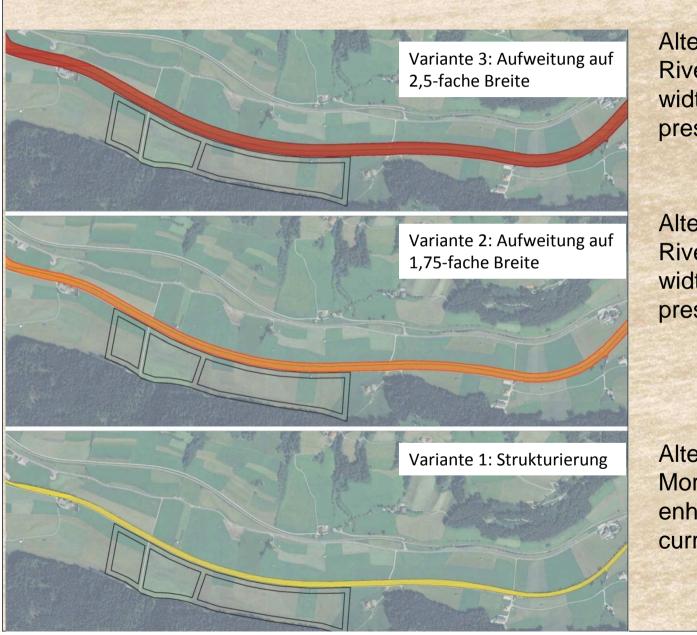
# **Combination of different pictures of river**

## landscape **Present status** Visualized scenarios, Hypothetical landscape "pristine reference" changes status... SEE River

### 00 present status



### **Application Example Drava River Stretch between San Candido and Versiaco**



Alternative 3: River widening up to a width of 2,5 times the present width

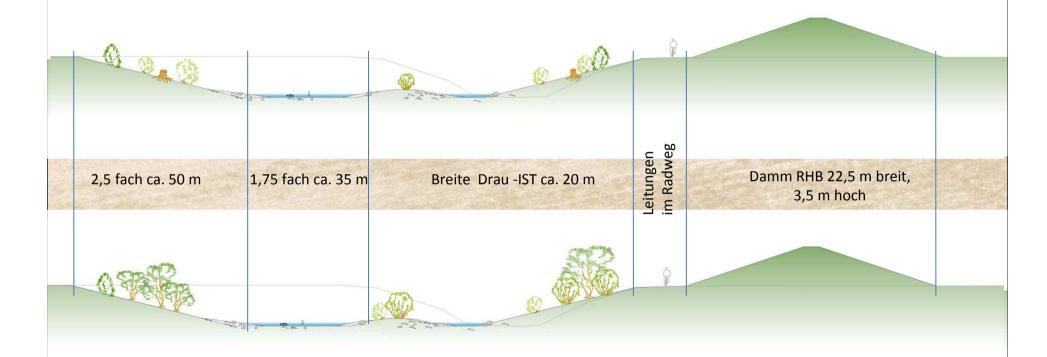
Alternative 2: River widening up to a width of 1,75 times the present width

Alternative 1:
Morphological
enhancements within the
current boundaries



### **Application Example Drava River Stretch between San Candido and Versiaco**

#### **Shortly after realization**

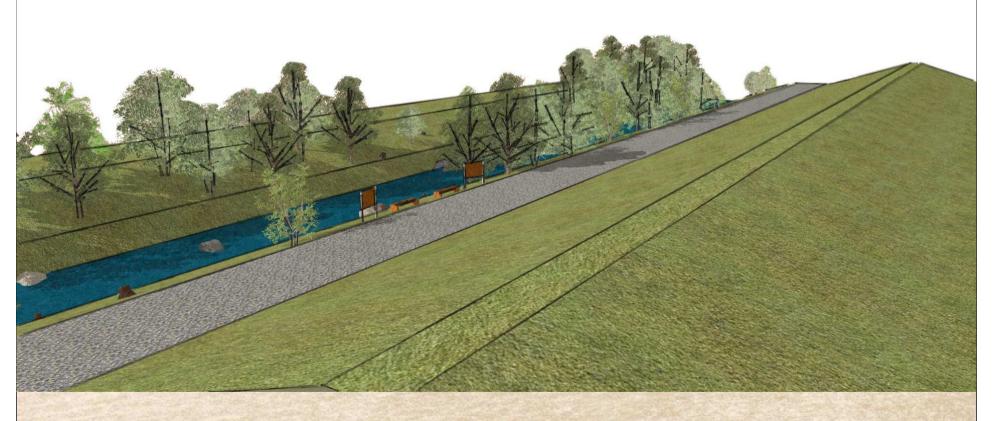


#### Several years after realization









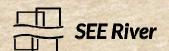




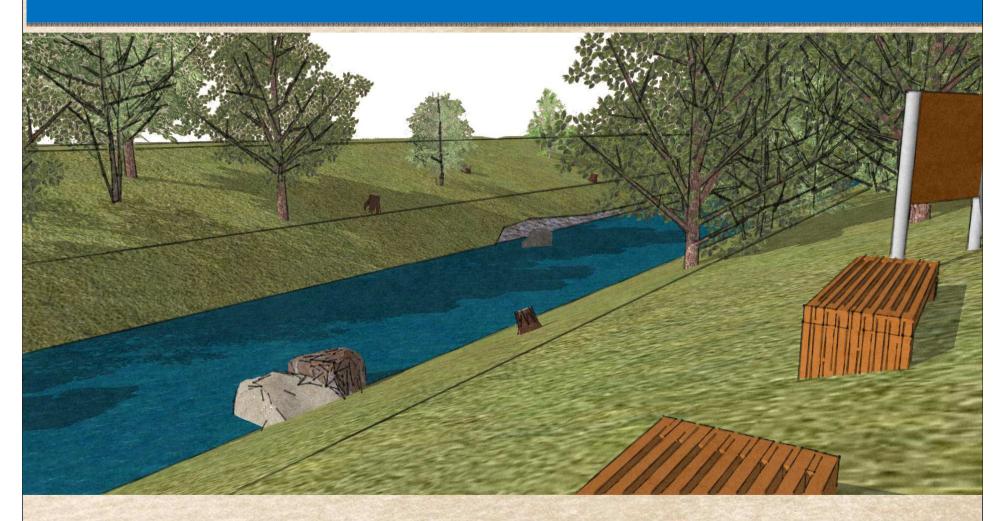








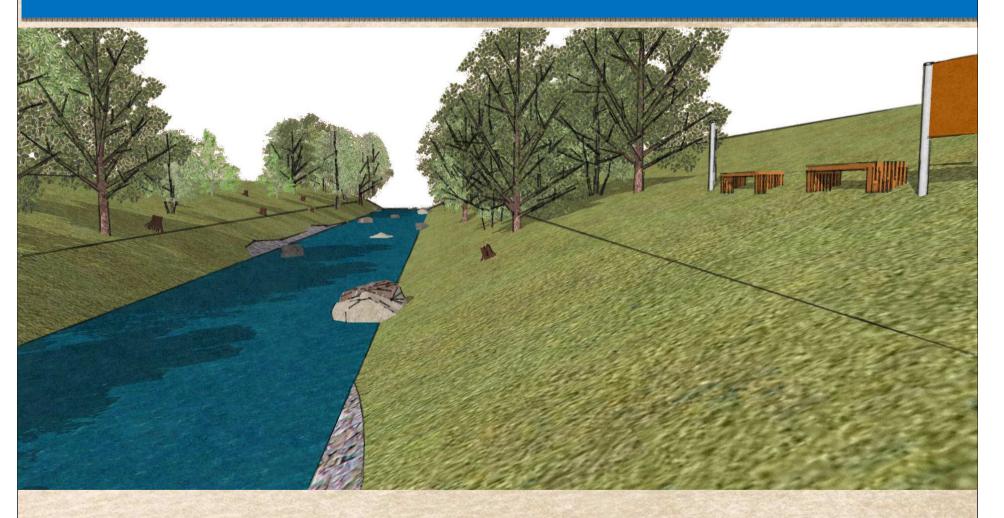




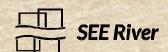








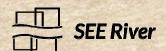




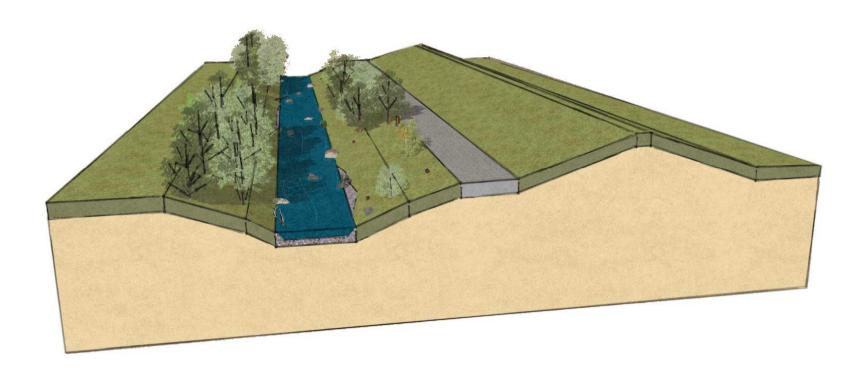












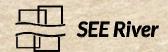




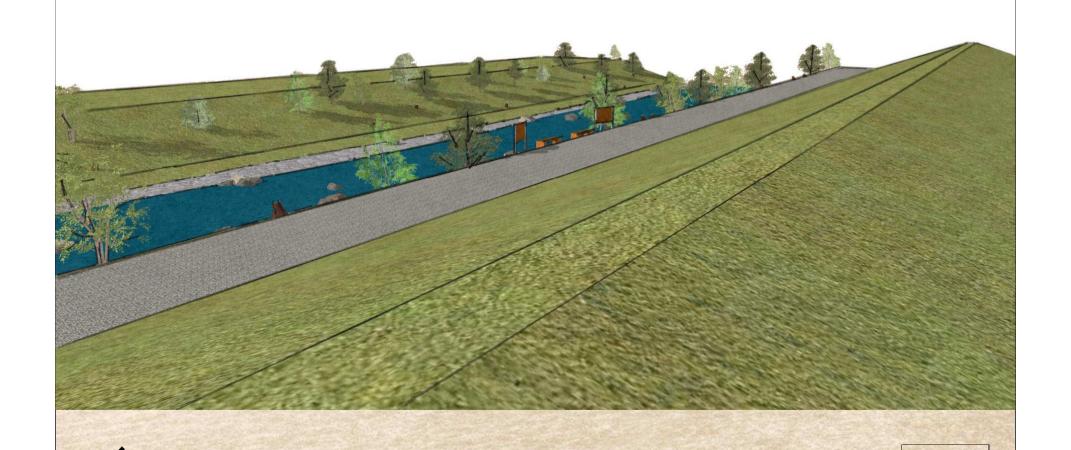








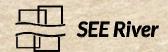




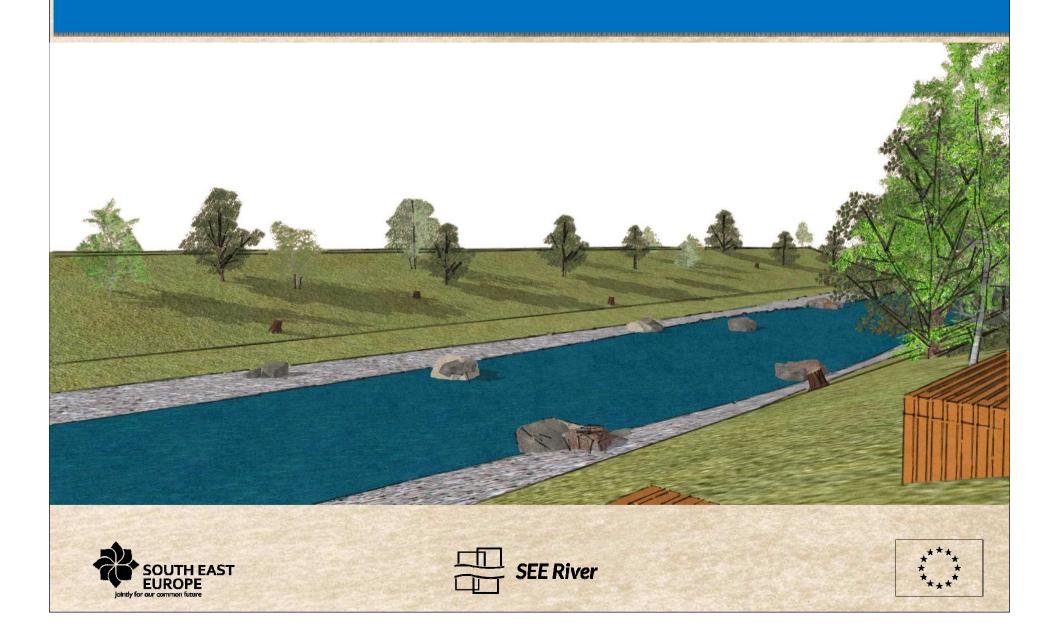


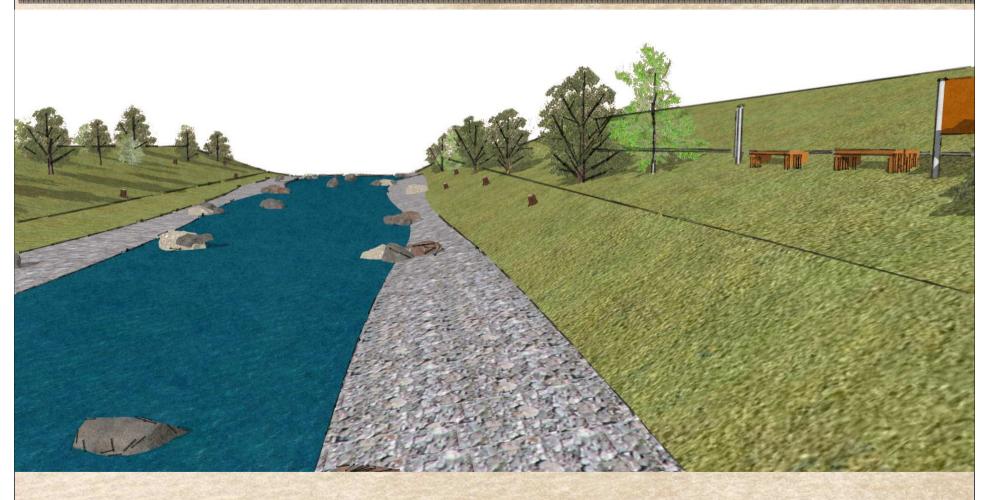




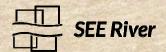






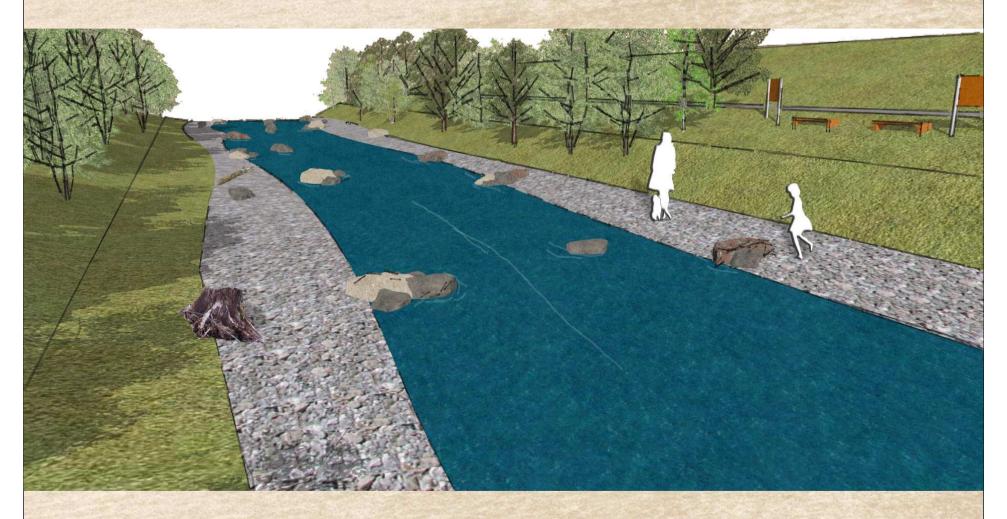




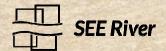




## **Visualisierung Variante 2 Aufweitung 1,75-faches**



















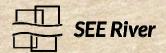








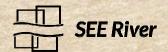








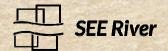












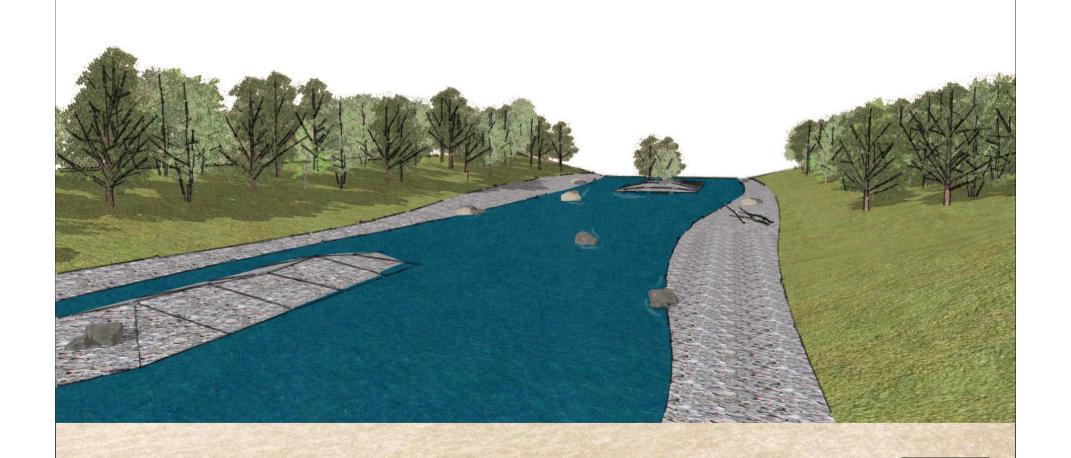










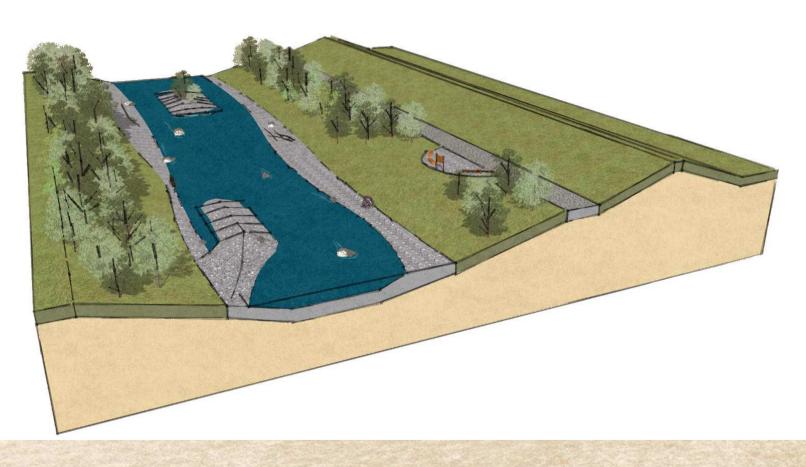


























#### **CONCLUSIONS:**

#### **PARTIALLY OPEN QUESTIONS:**

- Land acquisition: How much is needed (form an ecological and flood risk mitigation perspective) land acquisition/exchange model is in elaboration
- Decision regarding the positioning of the levees, bike route and related structures: leaving the bike route unchanged or transfer it on the levee (land demand?) detailed planning is in due course **RESULT**:
- Decision: Flexible implementation of the alternative 2! this is a "visualized and accepted point of departure" based on at least temporarily harmonized perceptions!

  CHALLENGE:
- Knowledge transfer to other river corridor management processes



