

Jun 22nd, 11:25 AM - 11:40 AM

## Session B1: Fish Passage in Large Rivers: Challenges and Solutions

Walter Reckendorfer  
*VERBUND AG*

Gerd Frik  
*VERBUND Hydro Power GmbH*

Roland Schmalfluss  
*VERBUND Hydro Power GmbH*

Sabine Käfer  
*VERBUND Hydro Power GmbH*

Gerog Loy  
*VERBUND Hydro Poer GmbH*

Follow this and additional works at: [https://scholarworks.umass.edu/fishpassage\\_conference](https://scholarworks.umass.edu/fishpassage_conference)



Part of the [Aquaculture and Fisheries Commons](#), and the [Hydraulic Engineering Commons](#)

---

Reckendorfer, Walter; Frik, Gerd; Schmalfluss, Roland; Käfer, Sabine; and Loy, Gerog, "Session B1: Fish Passage in Large Rivers: Challenges and Solutions" (2015). *International Conference on Engineering and Ecohydrology for Fish Passage*. 25.  
[https://scholarworks.umass.edu/fishpassage\\_conference/2015/June22/25](https://scholarworks.umass.edu/fishpassage_conference/2015/June22/25)

This Event is brought to you for free and open access by the Fish Passage Community at UMass Amherst at ScholarWorks@UMass Amherst. It has been accepted for inclusion in International Conference on Engineering and Ecohydrology for Fish Passage by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact [scholarworks@library.umass.edu](mailto:scholarworks@library.umass.edu).

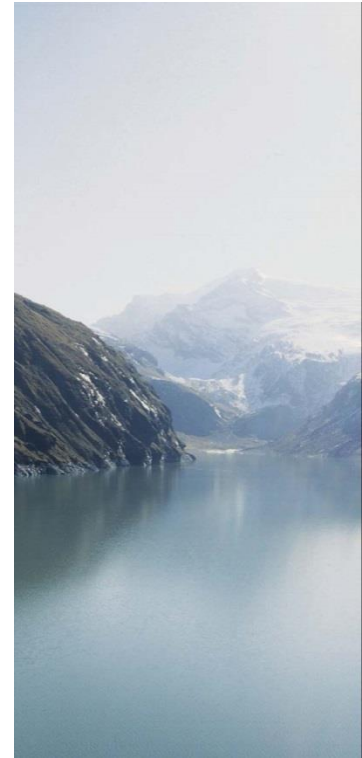
# Fish passage in large rivers

## Challenges and solutions

Walter Reckendorfer, Gerd Frik, Sabine Käfer, Roland Schmalfuß

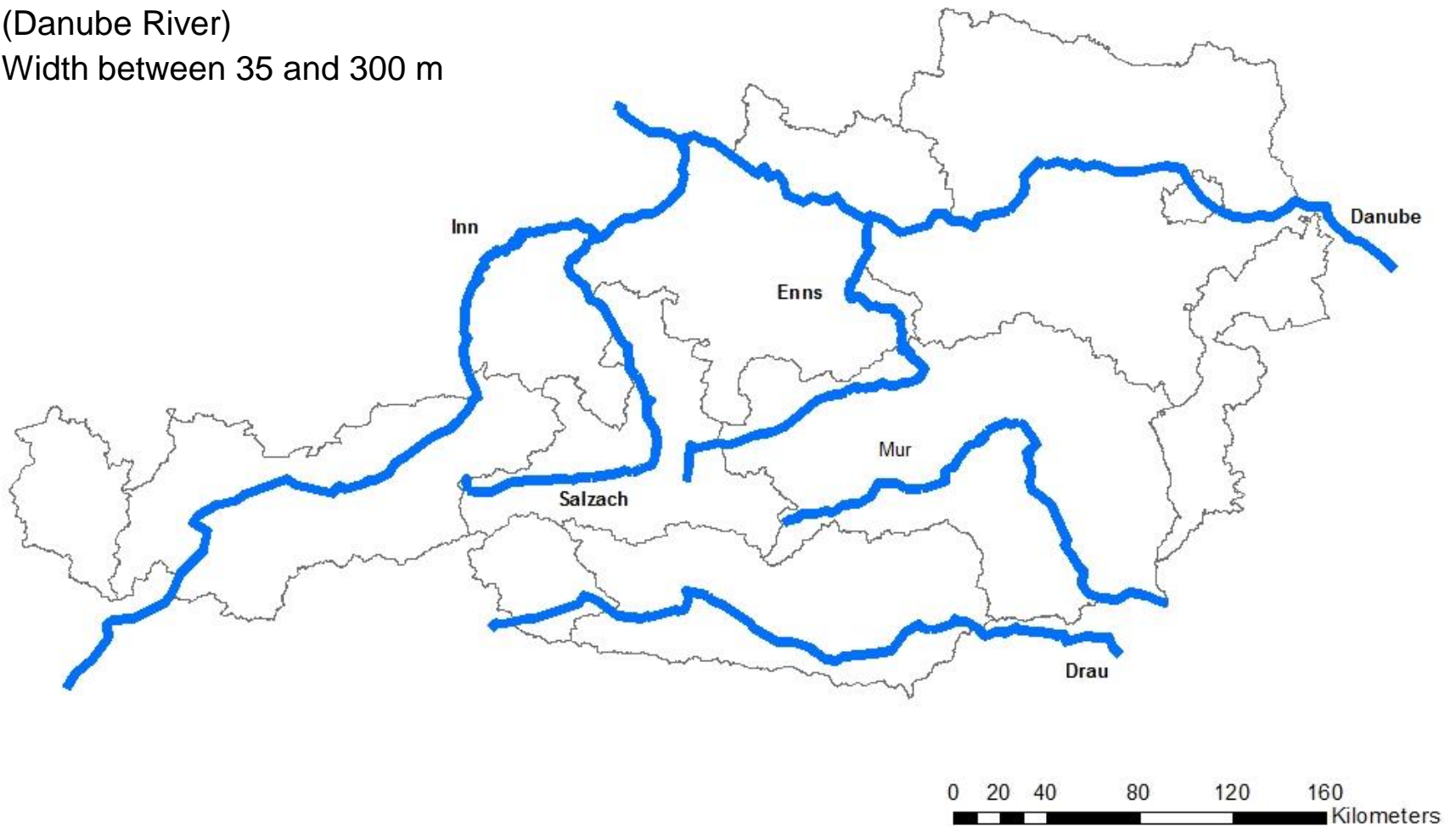
Fish Passage 2015

Groningen 22.06.2015



# Some big Rivers in Austria

- MQ 100  $\text{m}^3\text{s}^{-1}$  (Enns River, Mur River) to 2000  $\text{m}^3\text{s}^{-1}$  (Danube River)
- Width between 35 and 300 m



## Ecological Status/Potential

— high

— good

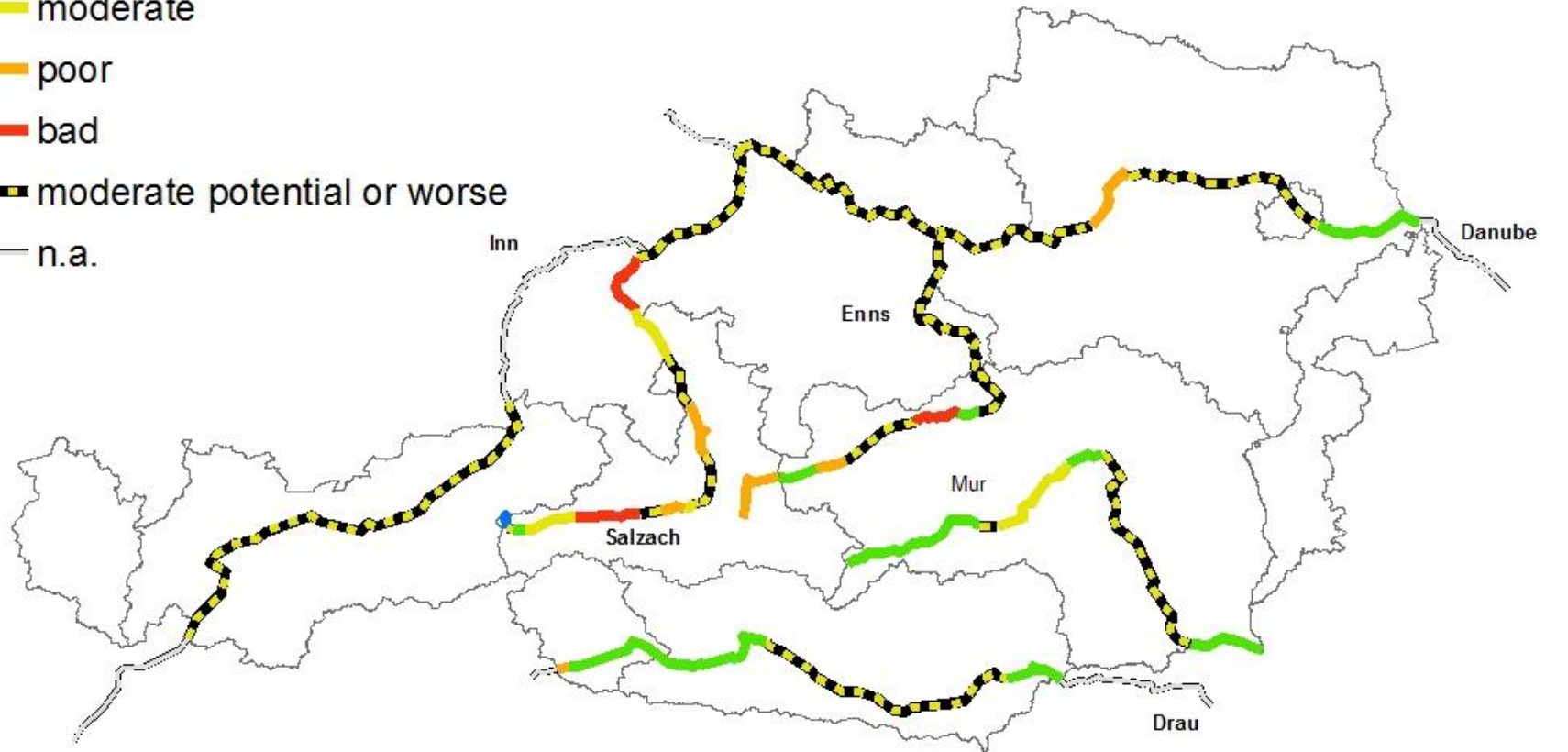
— moderate

— poor

— bad

— moderate potential or worse

— n.a.

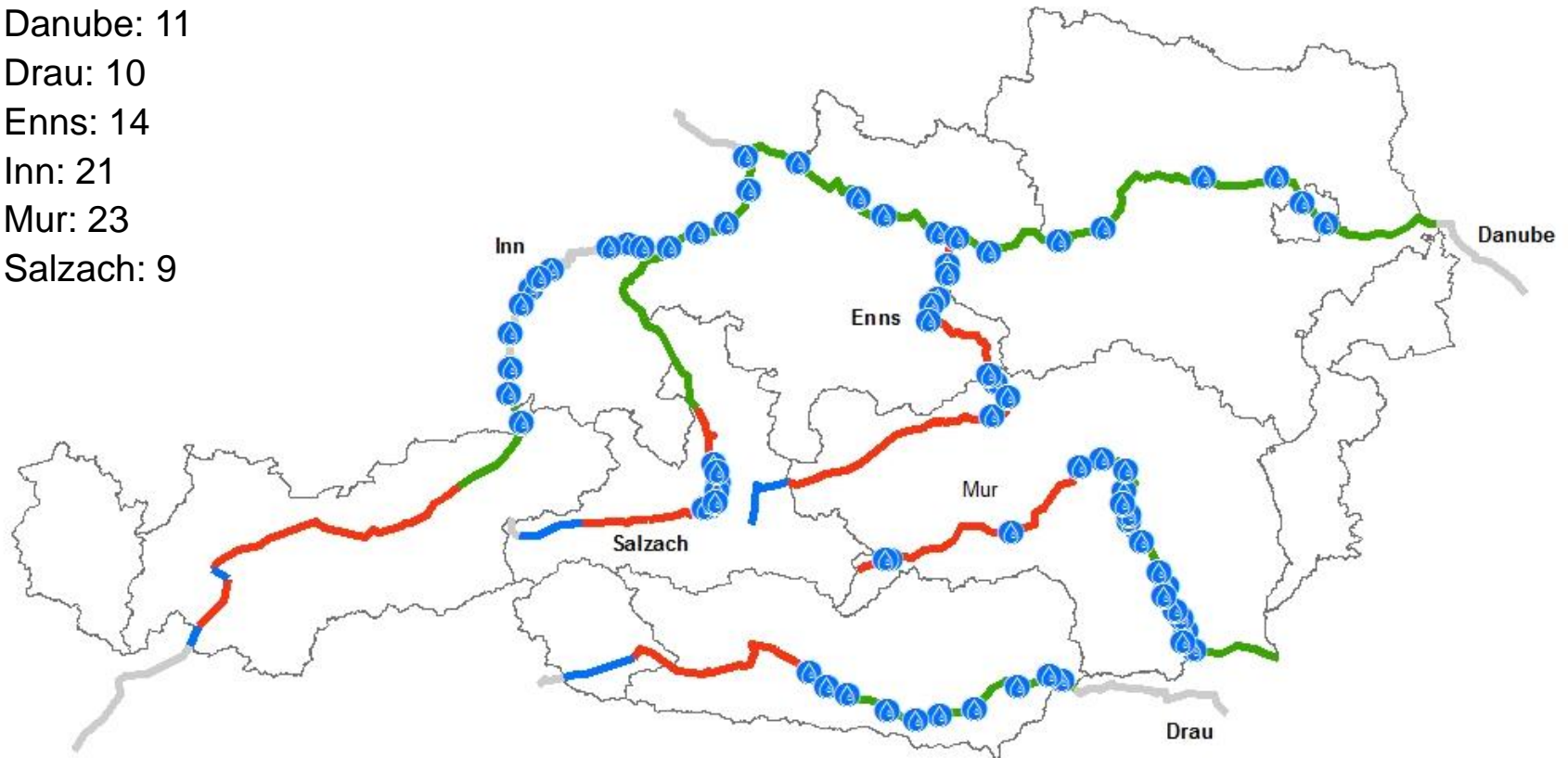


0 20 40 80 120 160  
Kilometers



# Powerplants (VERBUND & Co-operations)

- > 70 powerplants at large rivers
- Danube: 11
- Drau: 10
- Enns: 14
- Inn: 21
- Mur: 23
- Salzach: 9

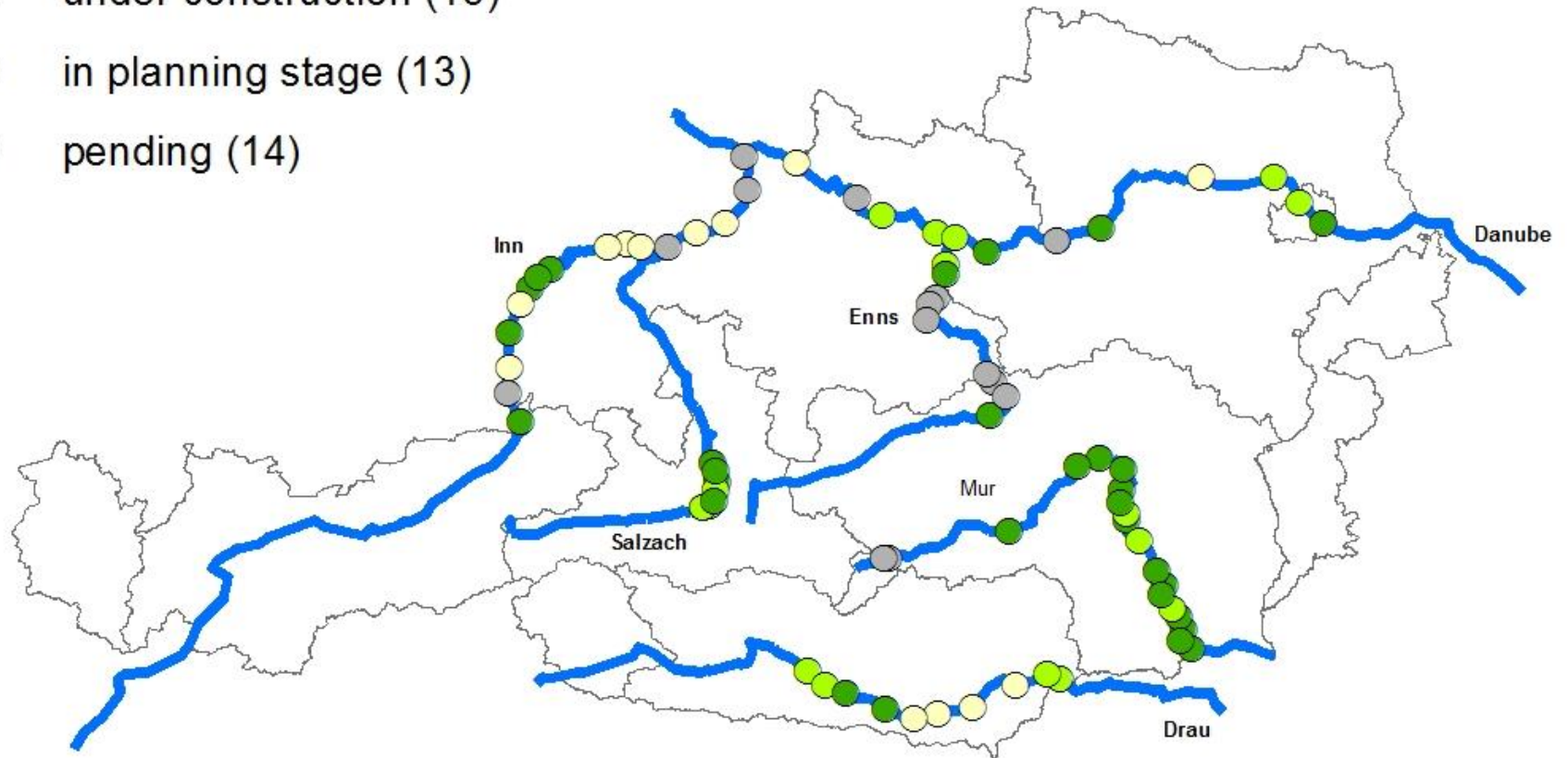


Green – barbel region, red – grayling region, blue – trout region

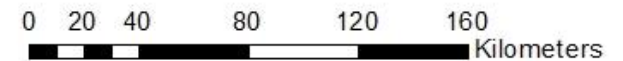


## Fish passage facilities – status of implementation

- implemented (31)
- under construction (16)
- in planning stage (13)
- pending (14)

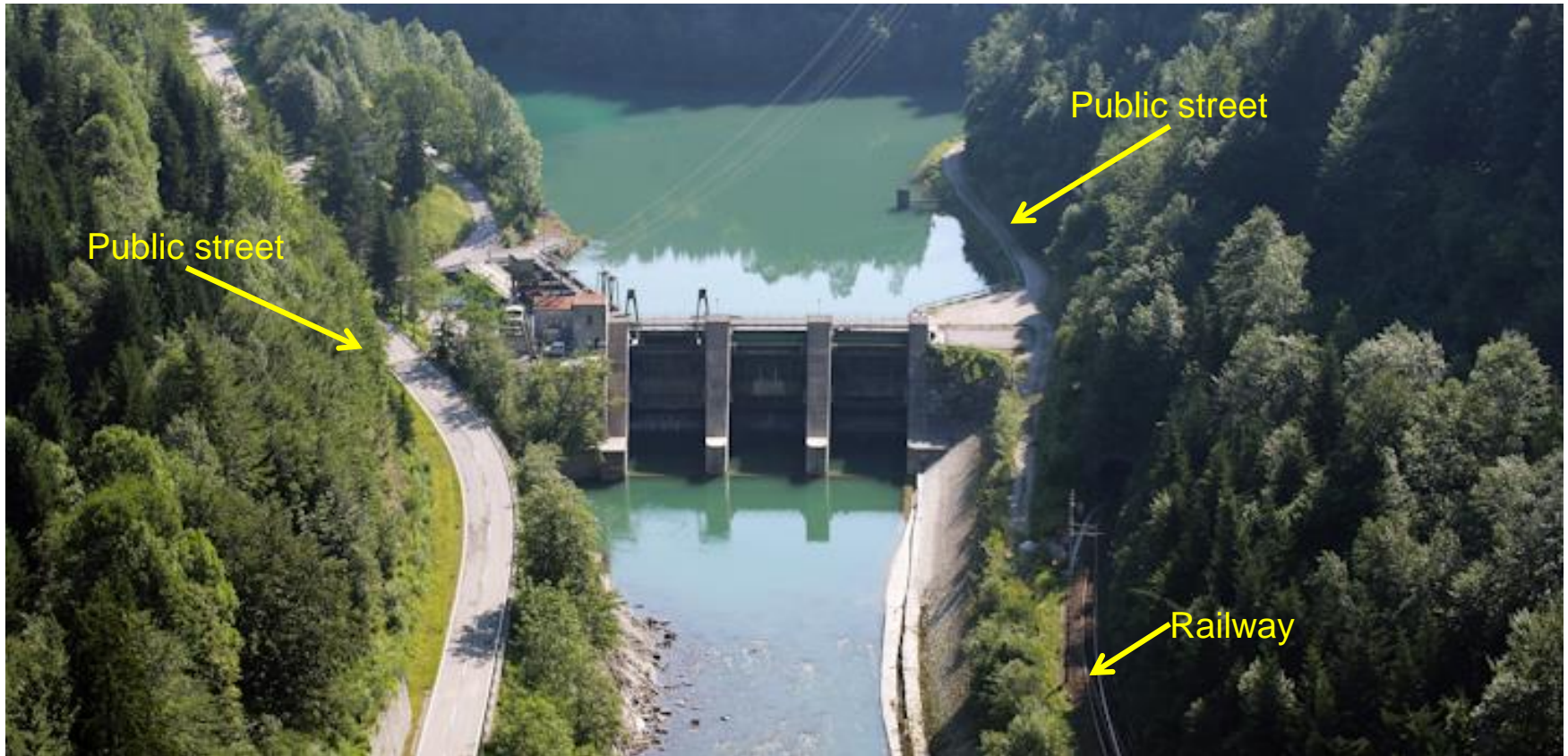


Fish passage facilities – status of implementation





## Dam Height and Space Limitation – Enns Valley



Powerplant Krippau (dam height = 23 m;  $Q_A = 120 \text{ m}^3 \cdot \text{s}^{-1}$ ):  
Vertical slot pass: > 150 pools; L > 500 m; new bridge; estimated cost: > 3.000.000 €

## Innovative measures - Fishscrew



Fish screw at the Mur (Sulm) river



## First results of the fish way monitoring

- Comprehensive monitoring program
  - Fyke
  - Telemetry
  - Pit Tag
- Preliminary results promising
  - 22 species
  - Weak swimmers – schneider / spirlin (*Alburnoides bipunctatus*)
  - Large fish – catfish (*Silurus glandis*)
  - Large numbers of key species:  
Nase (*Pseudochondrostoma nasus*),  
European chub (*Squalius cephalus*)



### Basic approach at „difficult“ sites

- Discussions with involved stake holders
  - Public authority
  - Scientific community
  - Consultant engineers
  - Fishermen
- Looking for mutual alternative solutions
  - Habitat improvements
  - New technologies
- Scientific Support :  
Close co-operation with the University of Natural Resources in Vienna

### Whenever possible - more than Fish Passage

- It became clear that for many water bodies fish passage “per se” is insufficient to achieve the ultimate goal of the “good ecological status” or “good ecological potential”.
- In addition, improvements to the aquatic habitat are required to increase the fish biomass and diversity considerably.
- One possibility to combine the goals of connectivity and habitat improvement are large nature like fish passes.

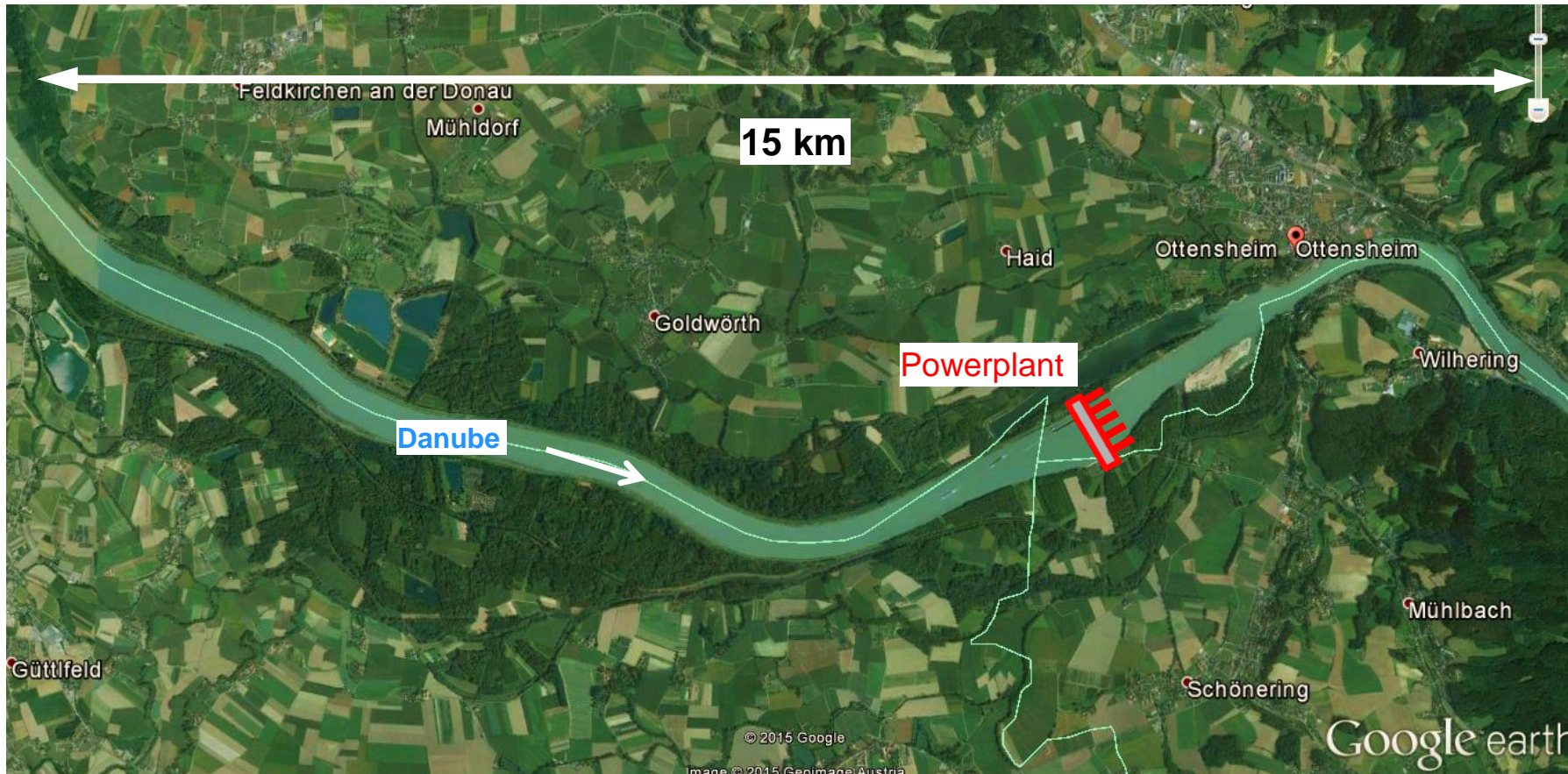




# Verbund

## Example nature like fishway – Ottensheim-Wilhering / Danube

status: under construction

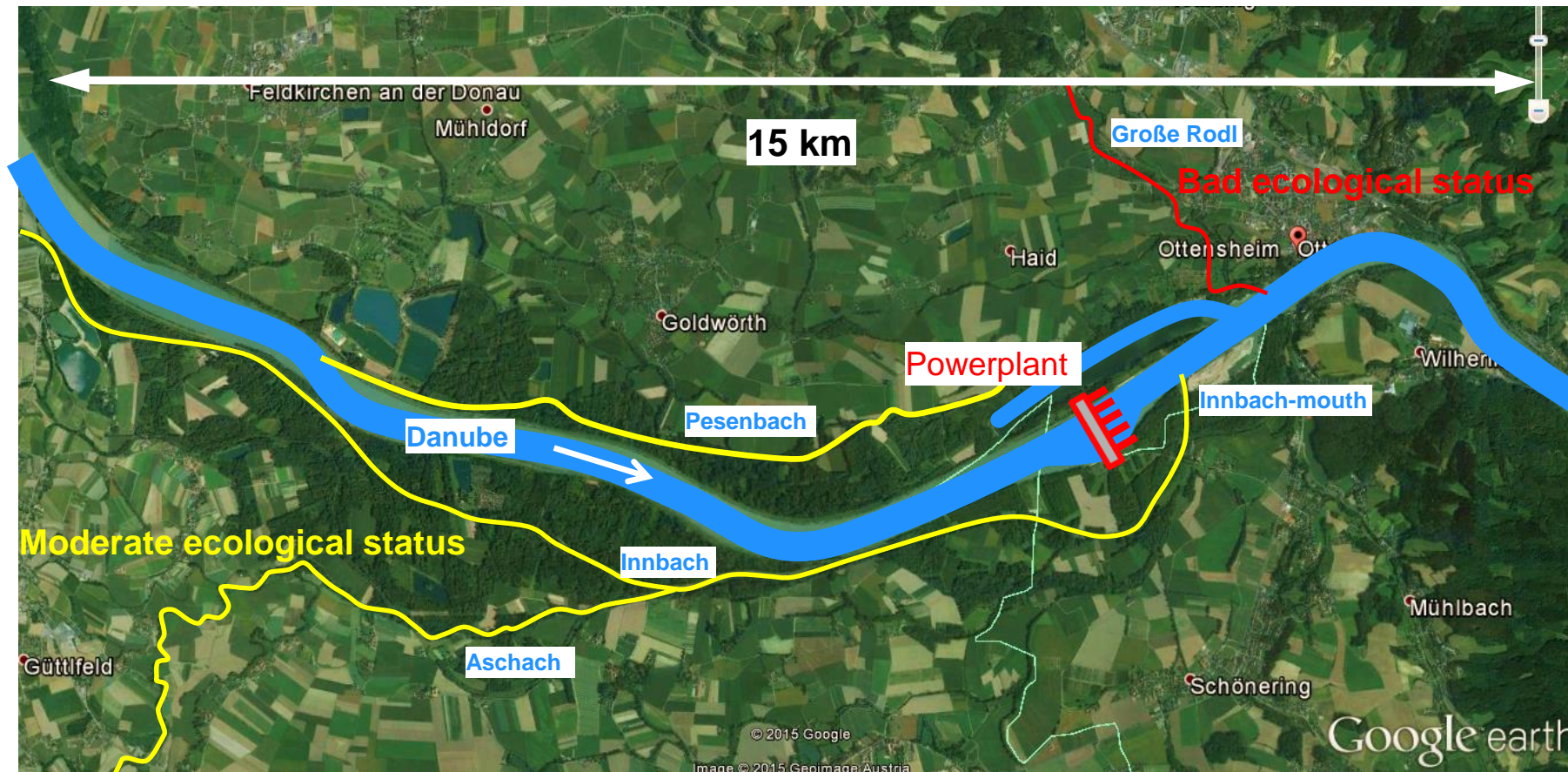


Heavily modified stretch at the power plant „Ottensheim-Wilhering“



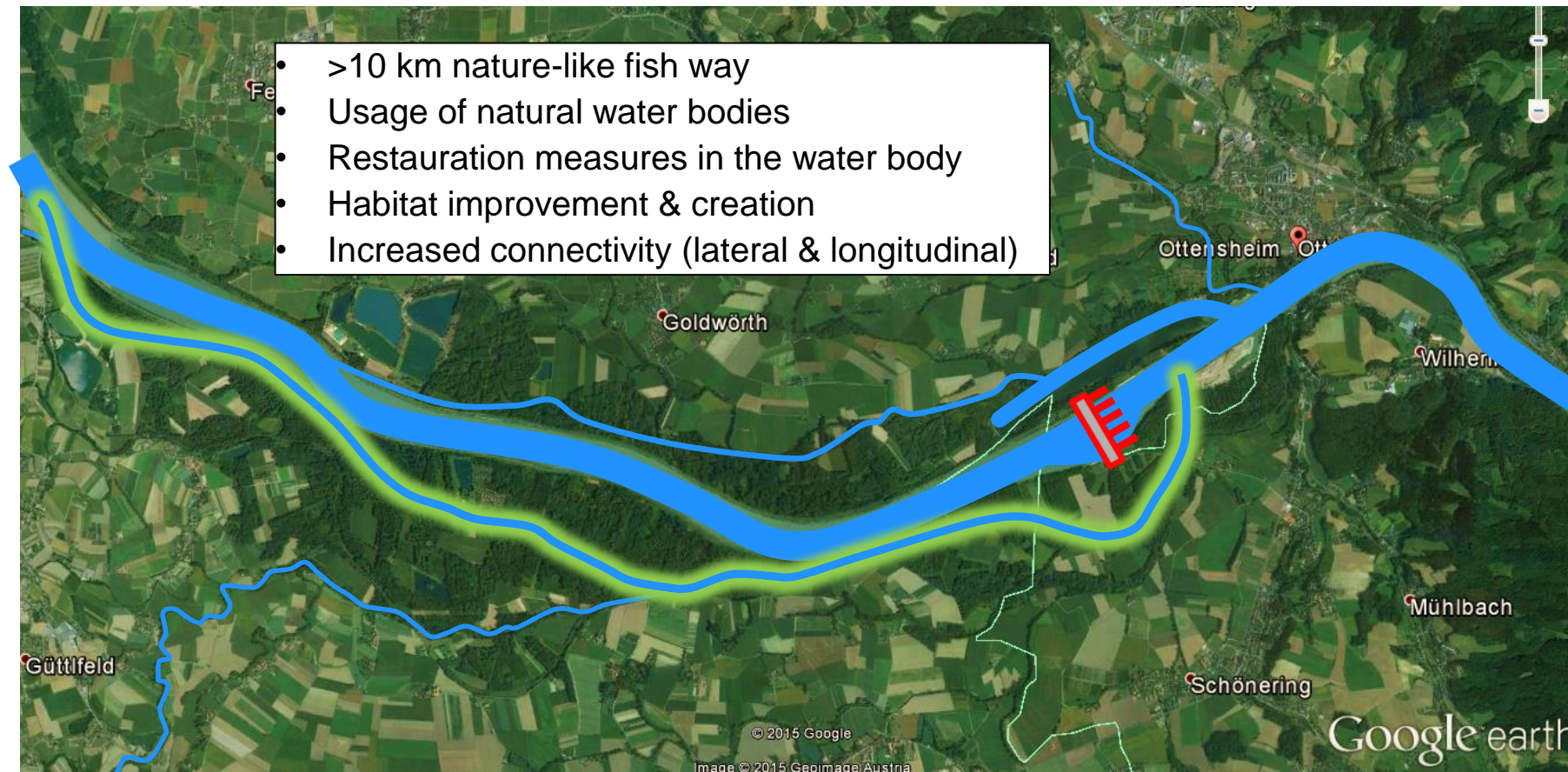
# Verbund

## Example nature like fishway – Ottensheim Wilhering / Danube





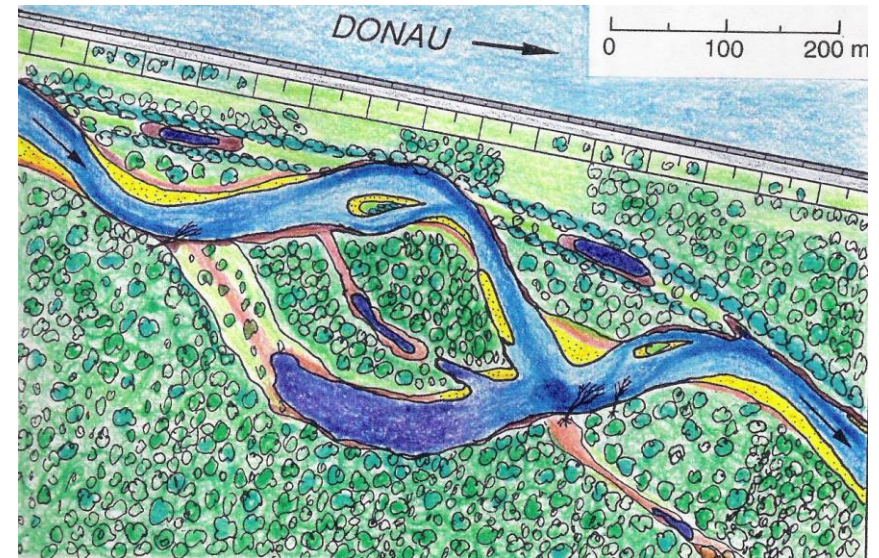
## Example nature like fishway – Ottensheim-Wilhering / Danube



## Example nature like fishway – Ottensheim-Wilhering / Danube Habitat improvement



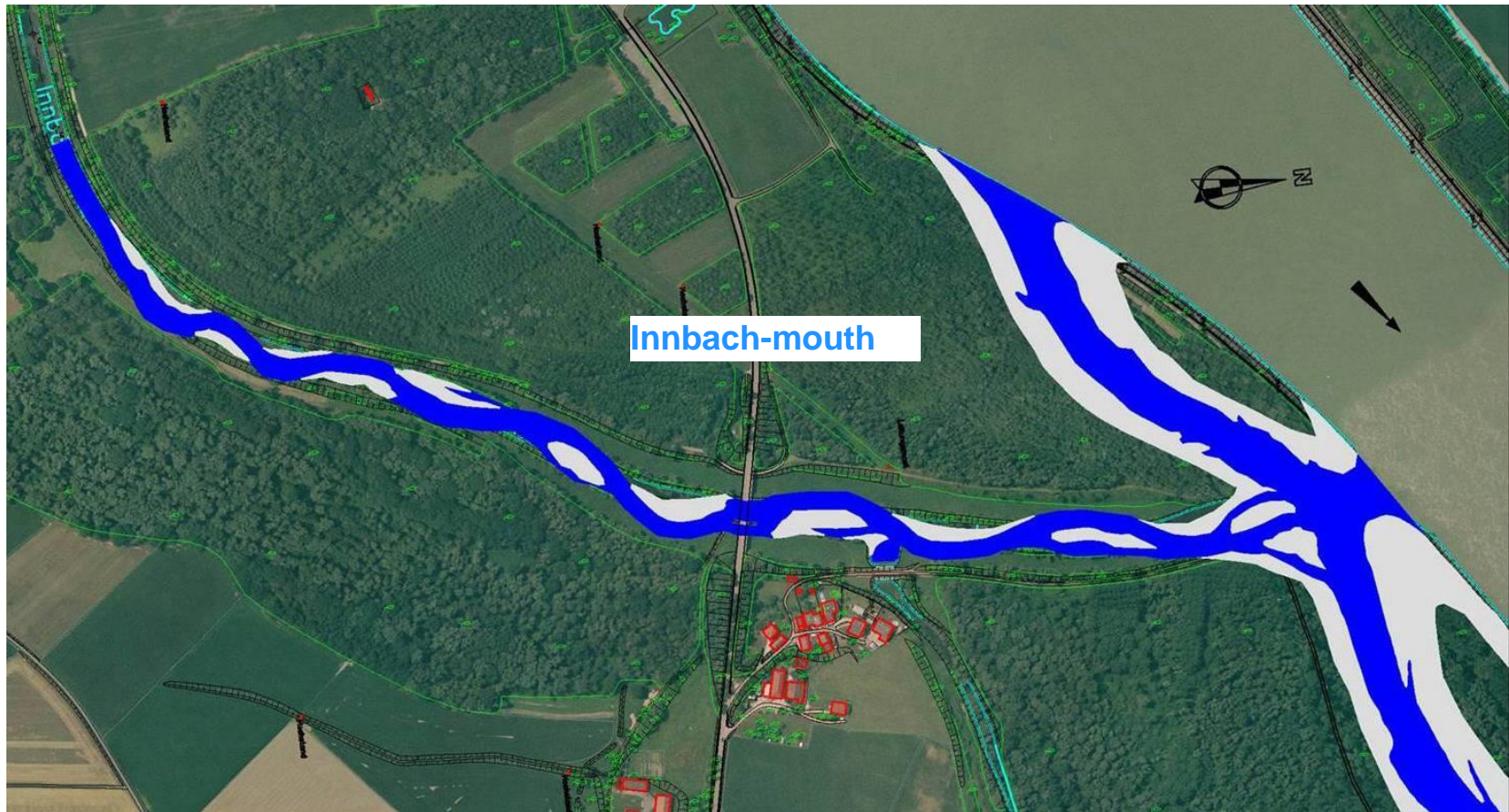
Local structures: woody debris, groyne



new stream bed, widening of the stream bed (Zauner & Karl, 1995)



## Example nature like fishway – Ottensheim-Wilhering / Danube



Detail of the mouth of the fishway – „Leitbild“ & expected development



## Example Inn River - Fischpass Gars 700 m long nature –like fish pass



©: Büro Schober 2014

### Example Inn – Spawning of *Hucho hucho*

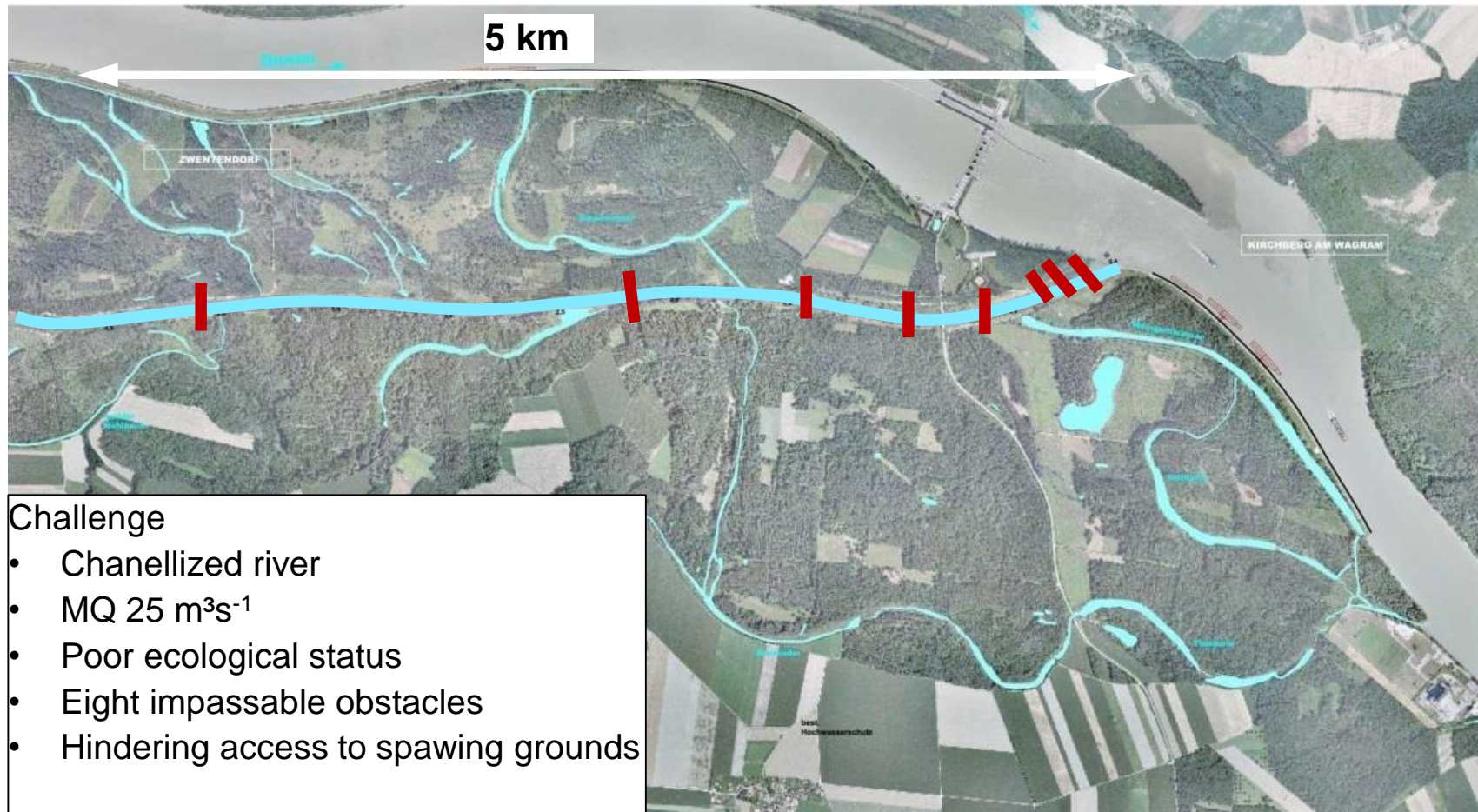


Danube salmon (*Hucho hucho*) spawning in the nature like fish pass in Gars/Inn River after opening





## Example Traisen River



### Challenge

- Channellized river
- MQ  $25 \text{ m}^3\text{s}^{-1}$
- Poor ecological status
- Eight impassable obstacles
- Hindering access to spawning grounds

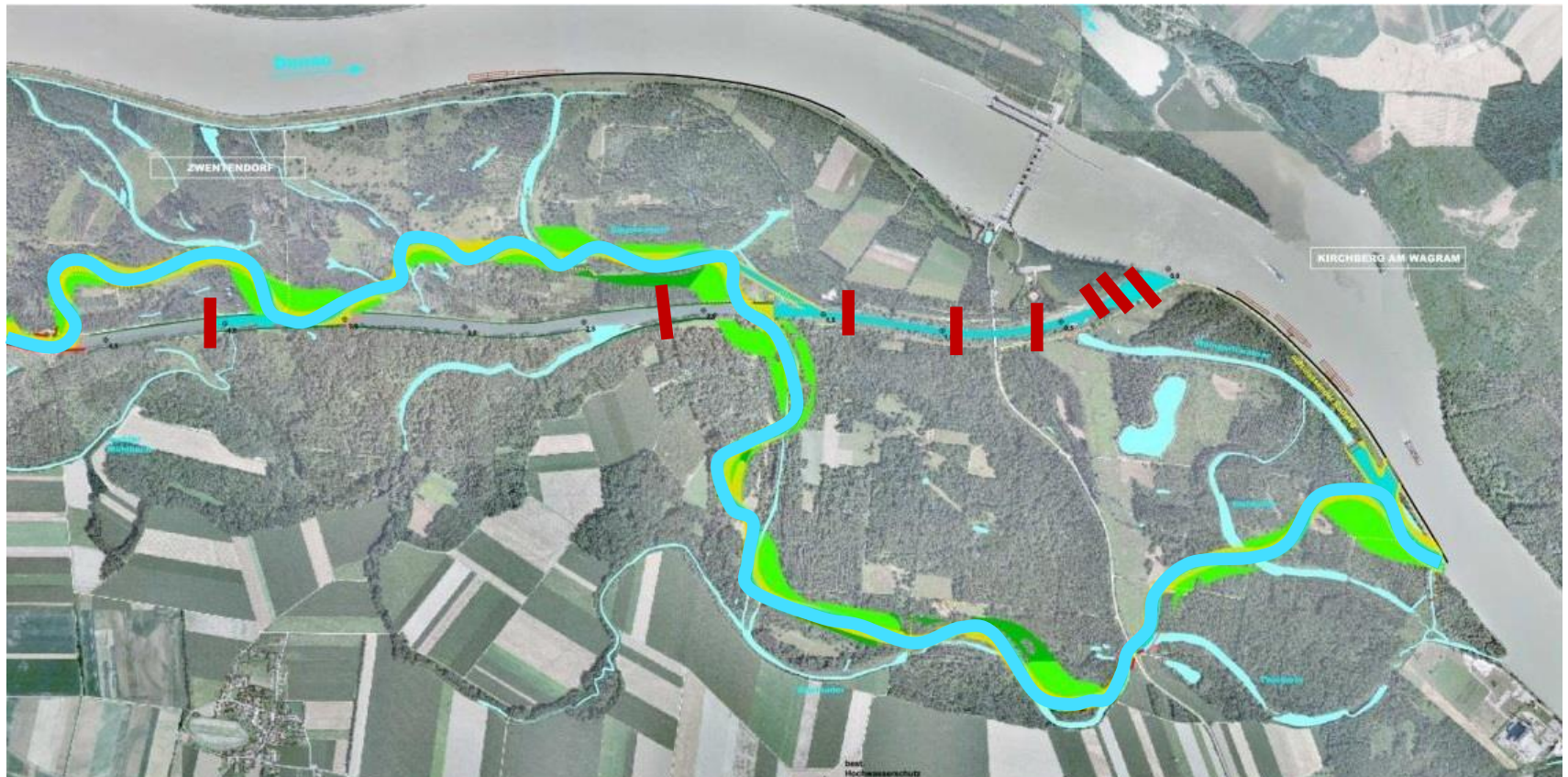
## Example Traisen River - Solution



- Generous restoration measures (>>Nature like fish pass) – improved lateral & longitudinal connectivity
- Ca. 10 km new river bed - Habitat for rheophilic species

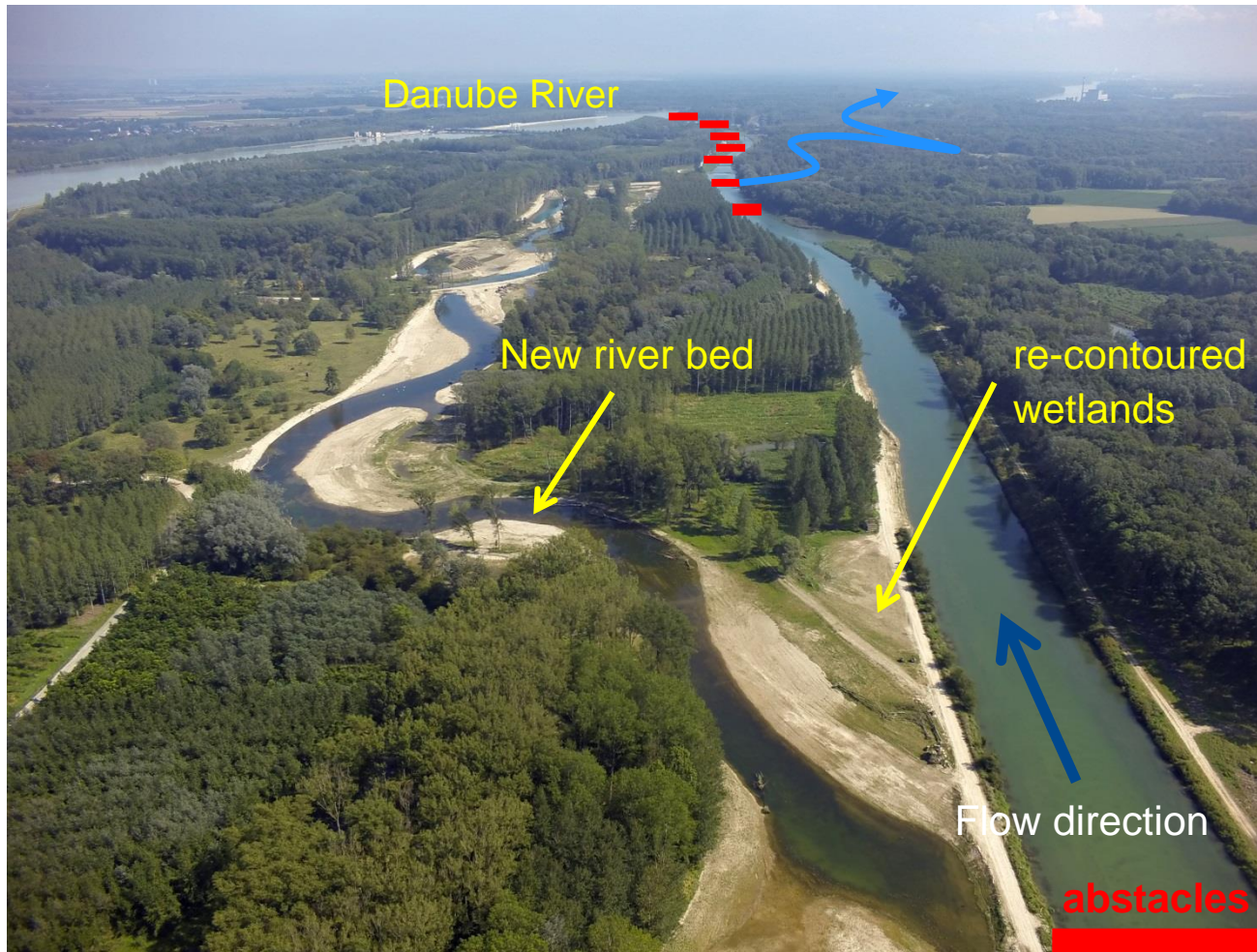


## Example Traisen River - Solution



- re-contouring the accompanying wetlands - Softwood forest, New Habitats of the EU habitat directive

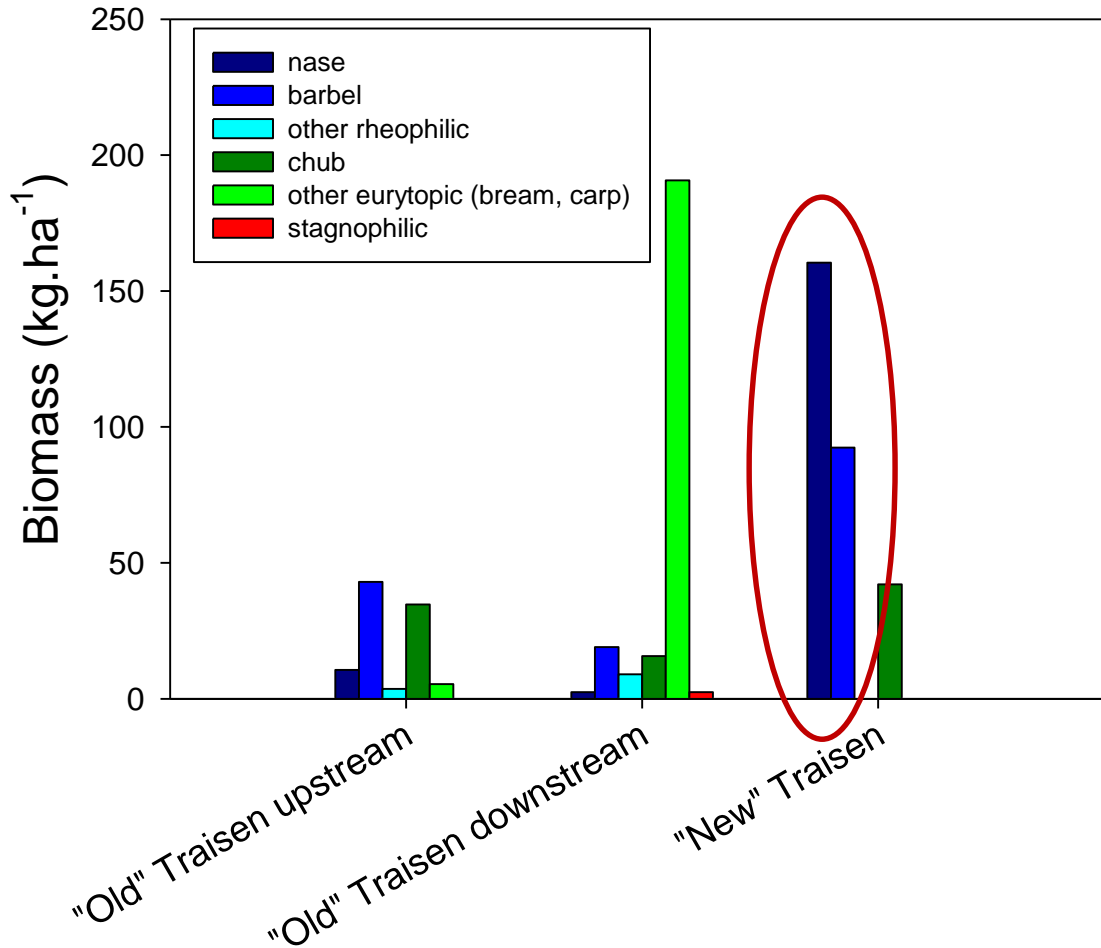
# Example Traisen – middle part (finished 2015)



Status: under construction; construction work began in 2014



# Example Traisen - Monitoring results



- Quick reaction of the fish community
- Increased biomass
- Habitat for rheophilic species
- Promote a "Leitbild"-like community

## Example Traisen - Monitoring results

Natural rejuvenation in re-contoured wetlands

New Habitats of the EU habitat directive - Softwood forest



White willow (*Salix alba*)



Black poplar (*Populus nigra*)





## Summary

- In most water bodies insuring Fish Passage alone is insufficient to achieve the good ecological status or potential
- Where possible, the design of fish passage facilities included other elements such as large scale connectivity measures and habitat improvements/creation
- First results are promising: even small scale “nature like” fish ways are used as spawning habitat
- Nevertheless, good solutions need time
  - Especially “difficult sites”
  - Learnings from implemented measures (monitoring)
  - Development and test of new solutions
- Very important:  
integrative planning including all stake holders (local authorities, fisheries science, fishermen, navigation authorities, innovative planners)

# Verbund

Thank You & our partners



## viadonau



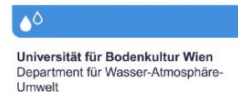
lebensministerium.at



wasser   
niederösterreich  
WA3 Wasserbau



TB Eberstaller



Contact:

Walter Reckendorfer  
VERBUND Hydro Power GmbH  
Europaplatz 2  
A-1150 Vienna, Austria  
Walter.reckendorfer@verbund.com