

Isar-Plan Munich

A New Lease of Life for the Isar River



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A New Lease of Life for the Isar River

presented by:

Ralf Wulf,
Daniela Schaufuß

City of Munich,
Department of Civil Engineering

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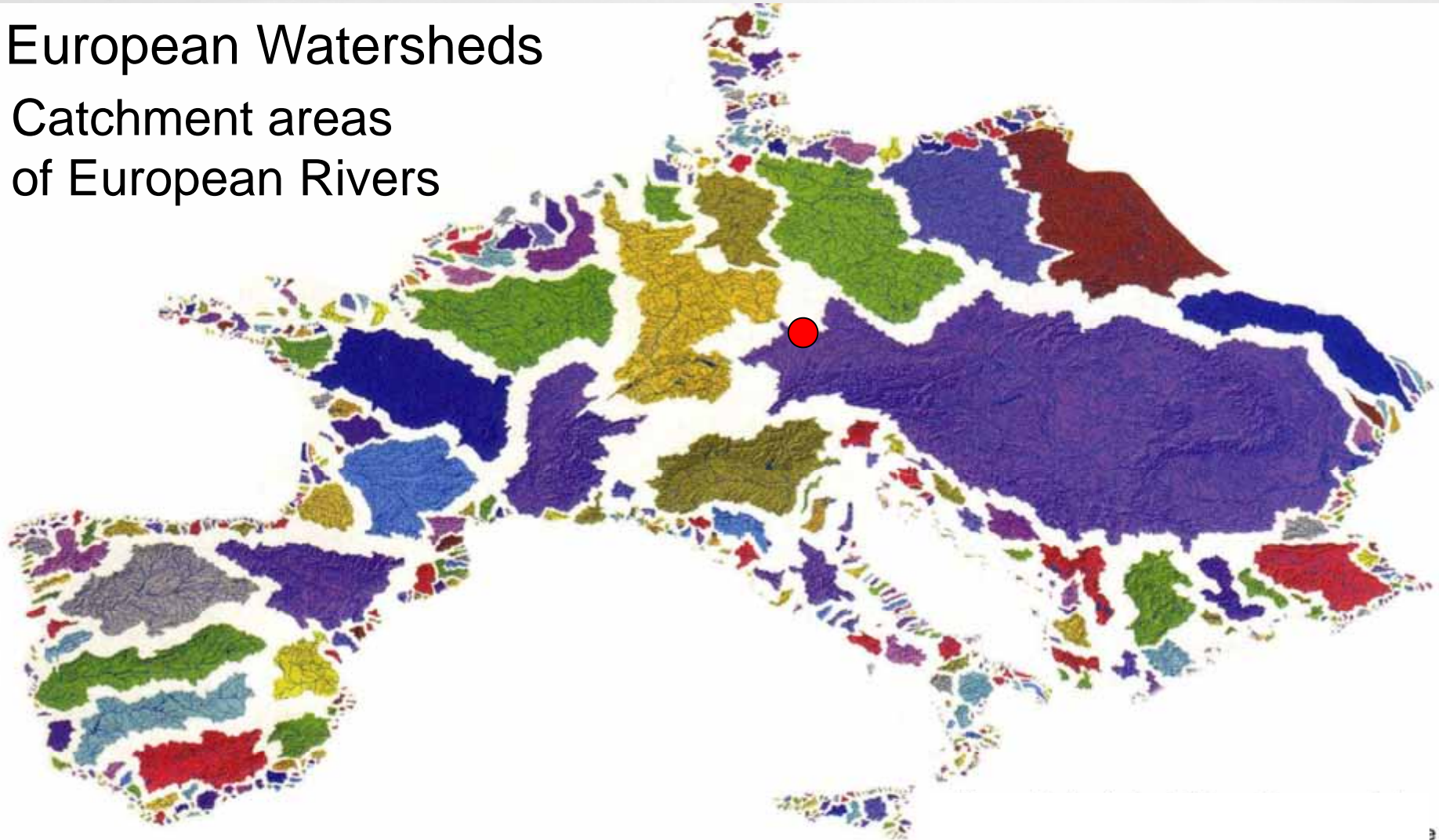
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European Watersheds

Catchment areas
of European Rivers



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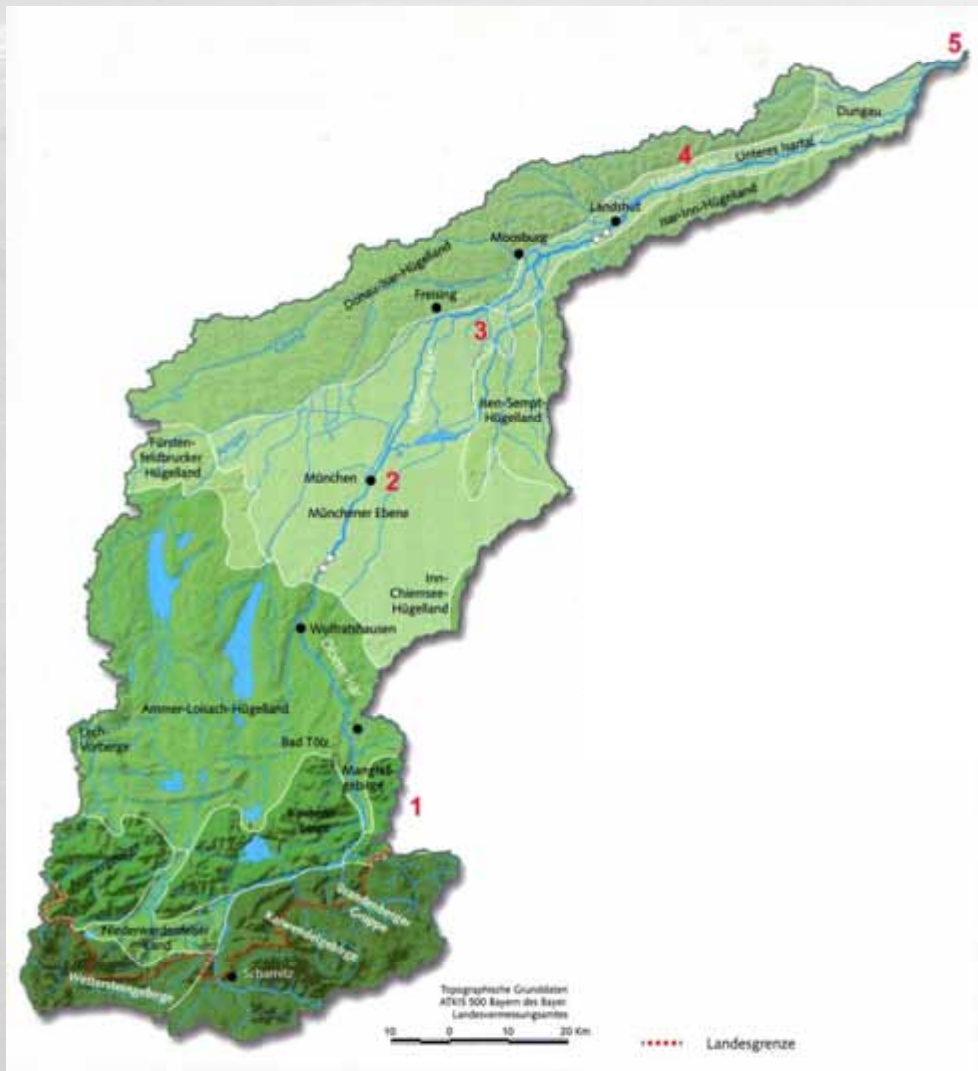
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Isar River sections

- 1 Upper Isar (alpine Character)
- 2 Isar in Munich (urban character)
- 3 Middle Isar (alluvial forest)
- 4 Lower Isar
- 5 Danube



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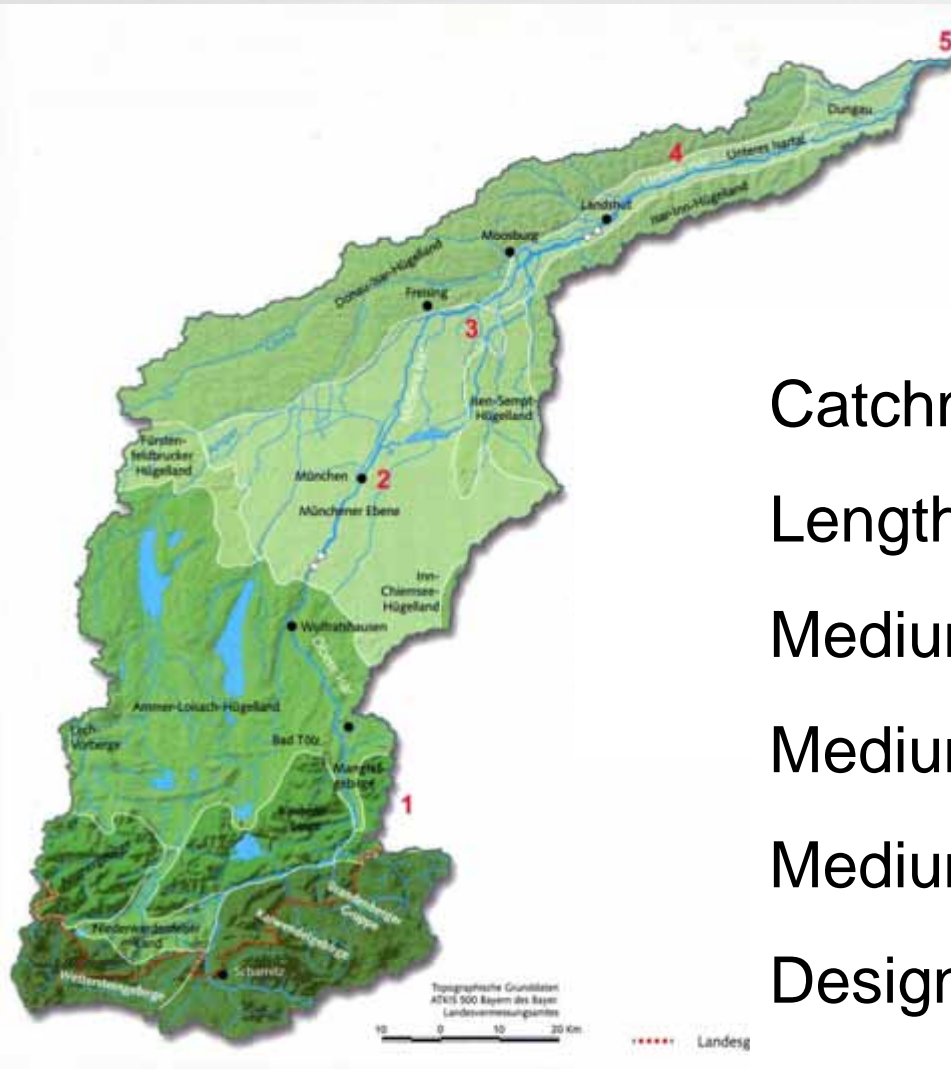
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Catchment area

9000 km²

Length

270 km

Medium Low Discharge

40 m³/s

Medium discharge

90 m³/s

Medium high discharge

420 m³/s

Design flood (100 a)

1.100 m³/s

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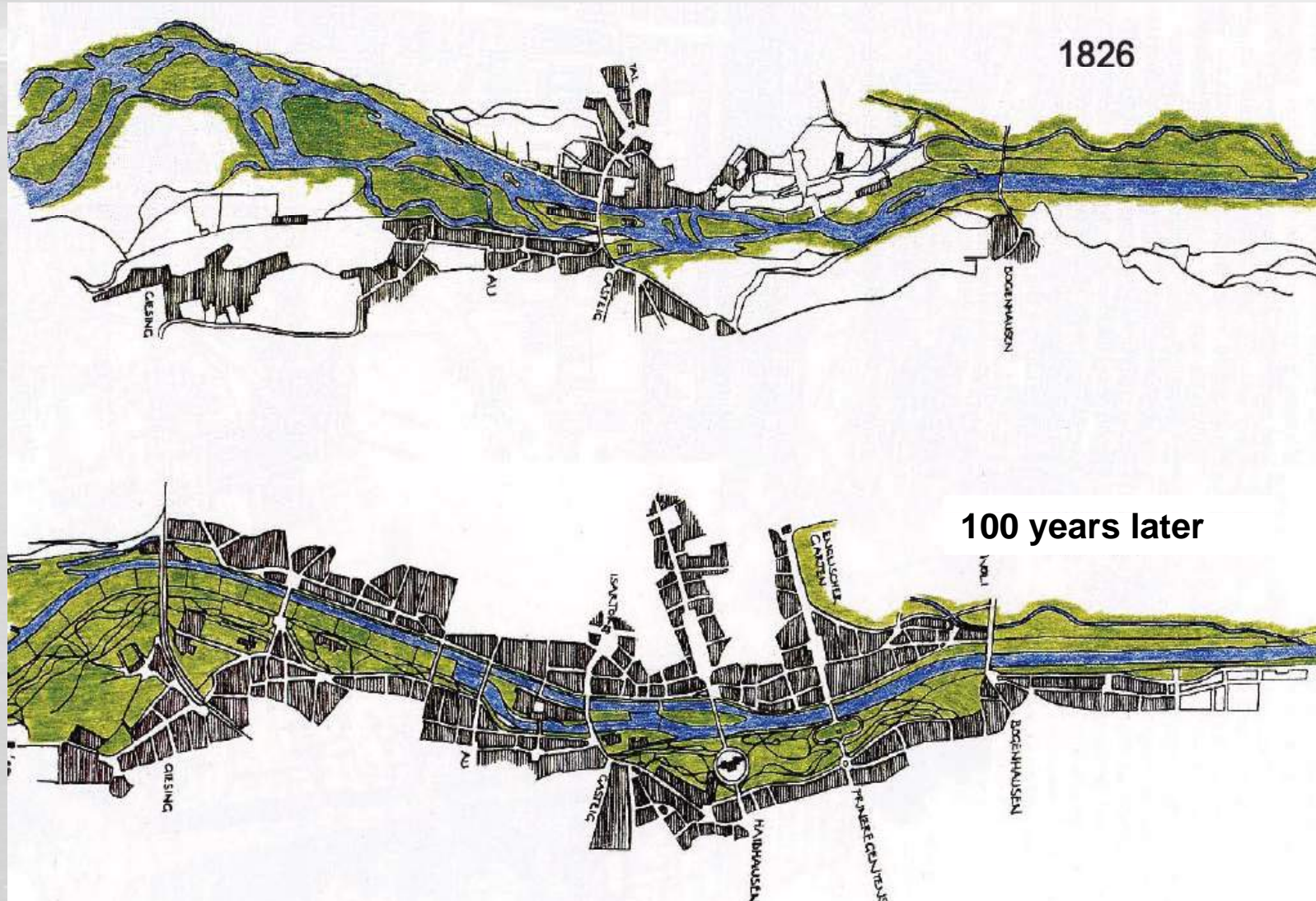
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Isar in Munich around 1930



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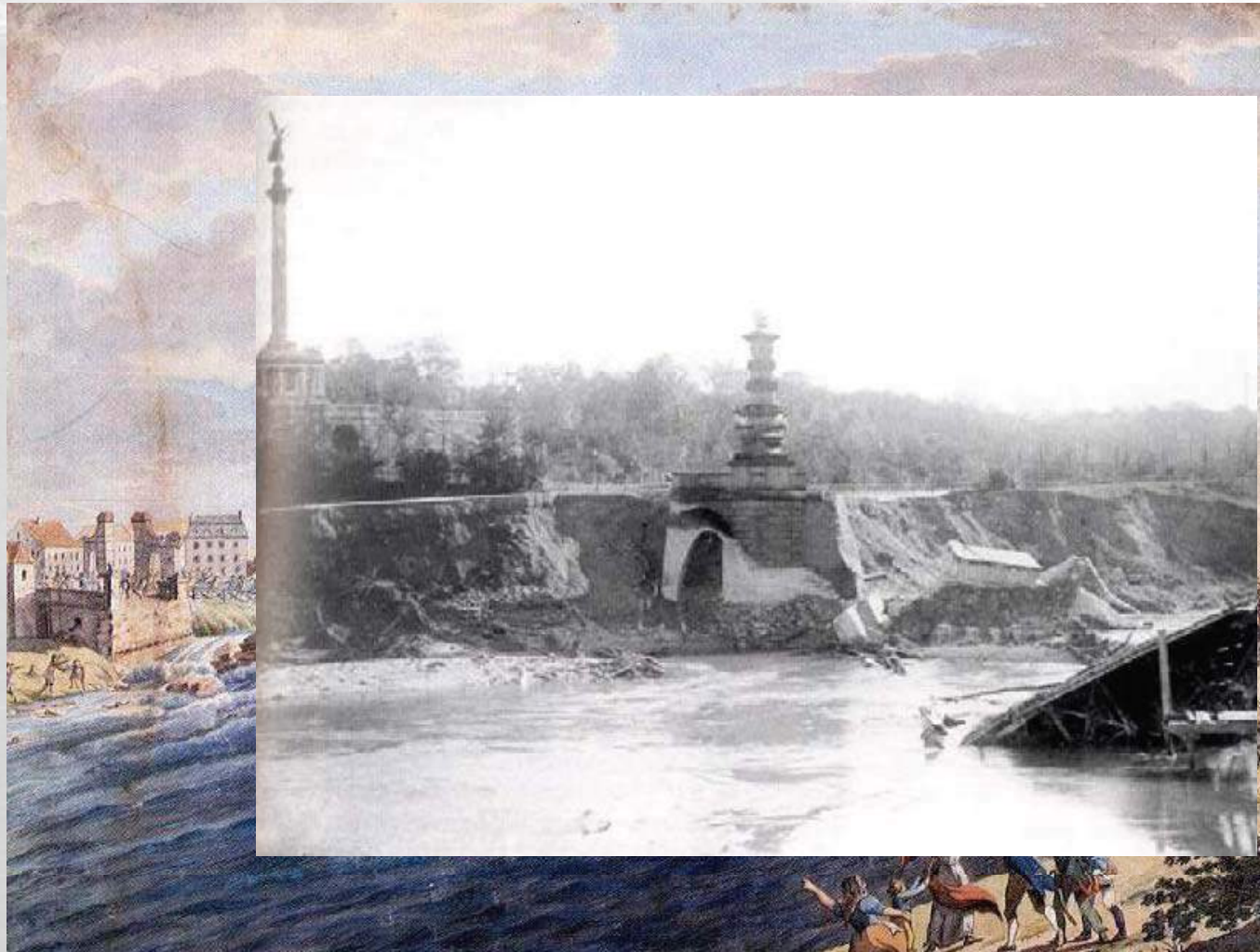
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Historic Floods:

collaps of the
Ludwigsbridge
13.09.1813

collaps of the
Prinzregenten-
bridge 1899

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Flauchersteg

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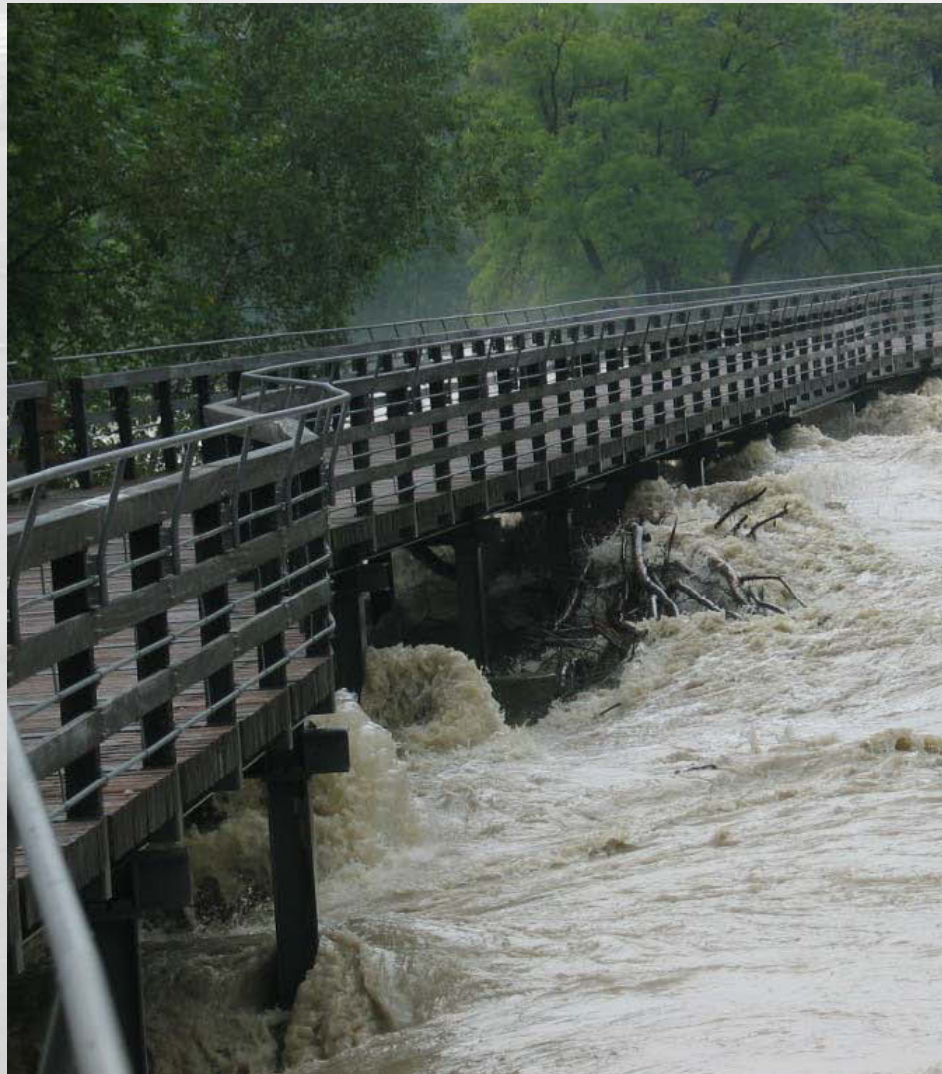
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Lake Sylvenstein



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Major Deficits of „civilized“ Rivers

Straightened and Dammed

Loss of ecological functions, habitats + groundwater interaction

Reduced morphological processes

Interruption of physical continuity

Minor water quality

Cut off floodplains with flood risks

No Access to waterline

Disturbed interaction between river bed and
surrounding landscape

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a canalized water course

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The River Isar within Munich:

- Canalized river section on both sides with dykes and quays
- flood plains as an important recreational area
- Usage of Isar-Water in electric power plants

- Reference: Flaucher

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Targets of Isar-Plans:

1. Improving flood protection



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Targets of Isar-Plans:

1. Improving flood protection
2. Nature related shaping of the river Isar



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Targets of Isar-Plans:

1. Improving flood protection
2. Nature related shaping of the river Isar
3. Improving possibilities for recreation



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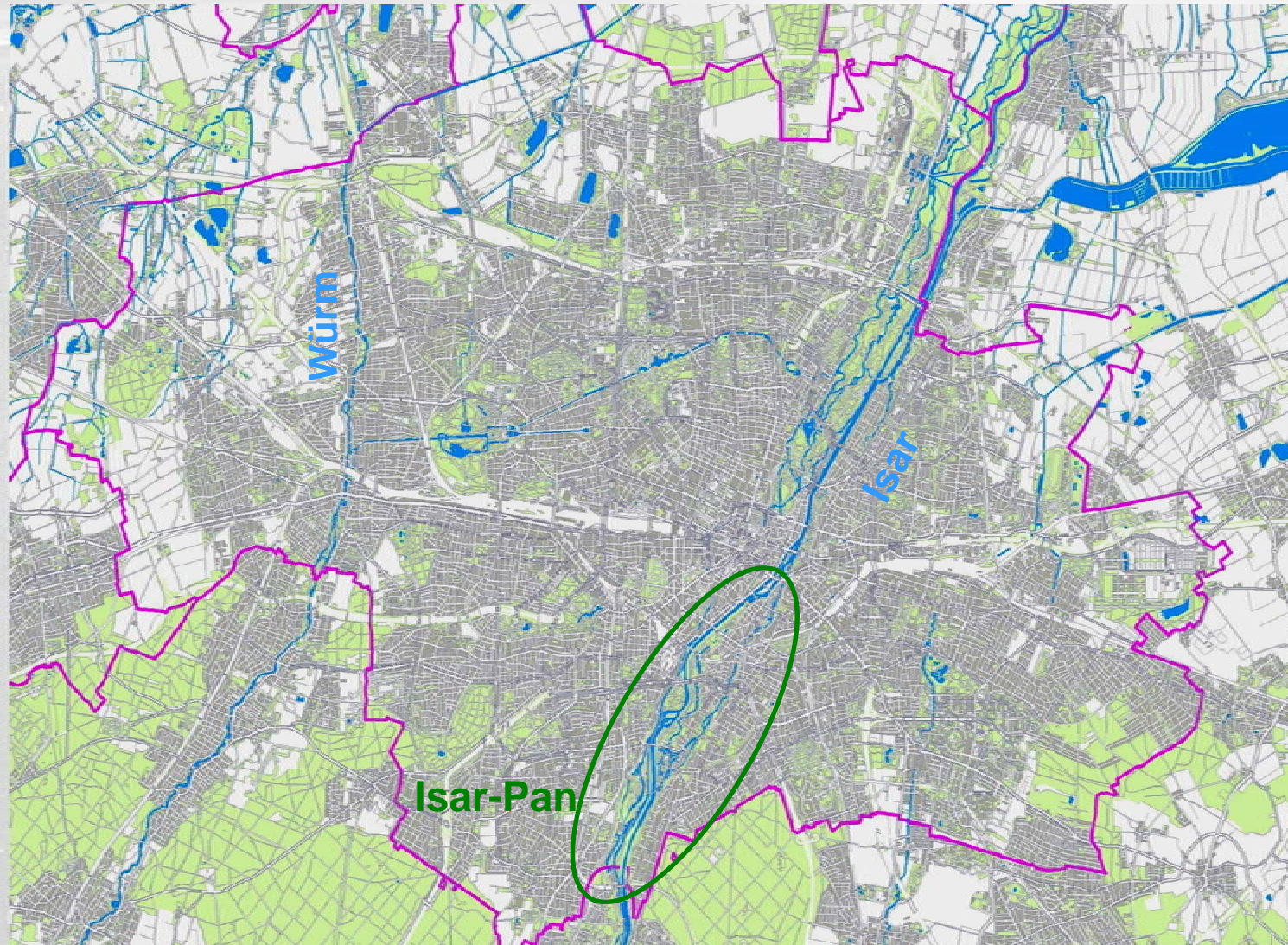
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- **Flood Control**
 - Water Retention Capacity
- **Restoration**
 - Ecological Upgrading of the river Isar
 - Morphological processes
 - Longitudinal and lateral continuity
 - Natural habitats, biodiversity, water quality
- **Recreation**
 - Access to waterline
 - Attractive landscape and views

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What it is.....

Area of waterway

Flood plains

Habitats

Gras as protection

Dykes for flood protection

Maintenance sidewalks

What it is used

going by boat

swimming

walking

horse riding

barbecuing

cross-country skiing

toboggan

partying

cycling

walking the dog

sun bathing



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Competition and Workshops:

- Mediation
- Participants:
Administration of the City of Munich and Bavaria
Planning Teams (Competitors)
- Participants:
Politicians
NGO's

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- Raising and reinforcement of river dikes
- Removal of concrete embankments
- Widening of the river cross section
- Increase of capacity in river runoff
- Natural river bottom rock ramps or slides with riffles and pools, instead of linear low weirs
- Initialization of dynamic river bed processes; development of natural river structures
- Longitudinal river continuity to allow river organisms, e.g. fish, to swim upstream
- Establishment of typical river habitats

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View from the Tower of the
“Deutsches Museum”

Model of the Present
Situation in Obernach



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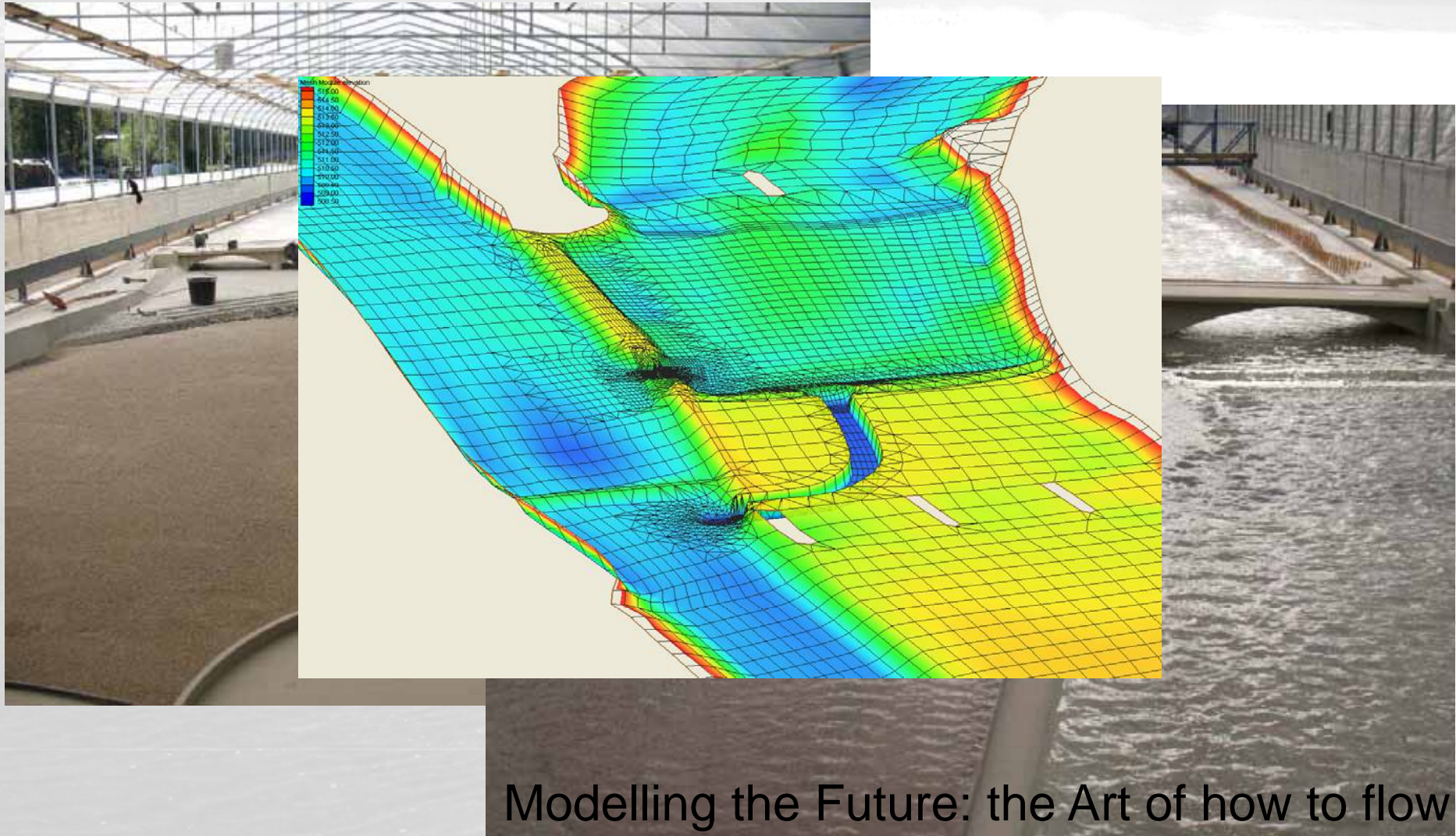
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Modelling the Future: the Art of how to flow

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Spring 2006



Summer 2013

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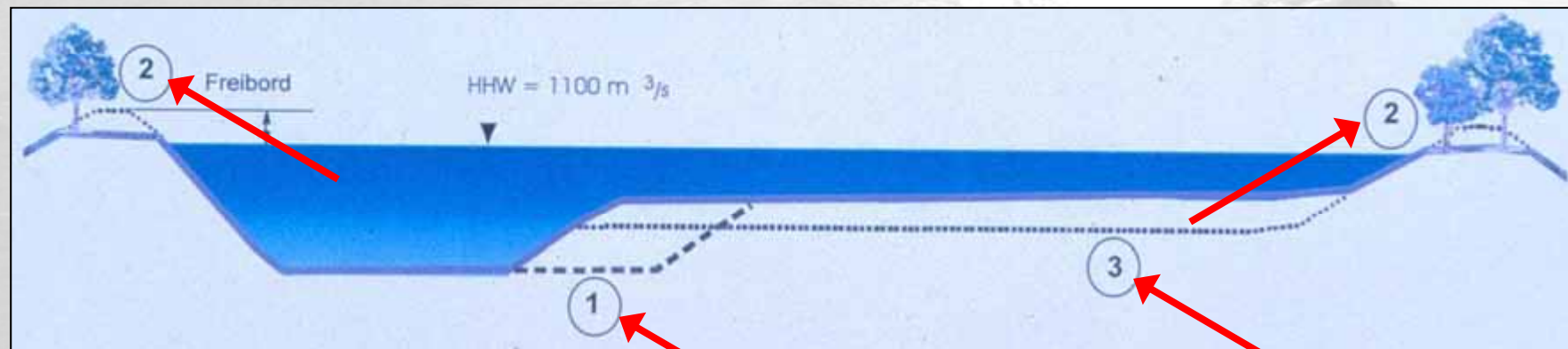
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Improvement of Flood control by

- ① Enlargement of river cross-section
- ② Elevation of Dikes
- ③ Removal of sediments in the flooding area



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Measurements:

- Widening the riverbed from 50 m up to 90 m



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Measurements:

- Widening the riverbed from 50 m up to 90 m
- rebuilding banks (flattening, fixing and covering with gravel)



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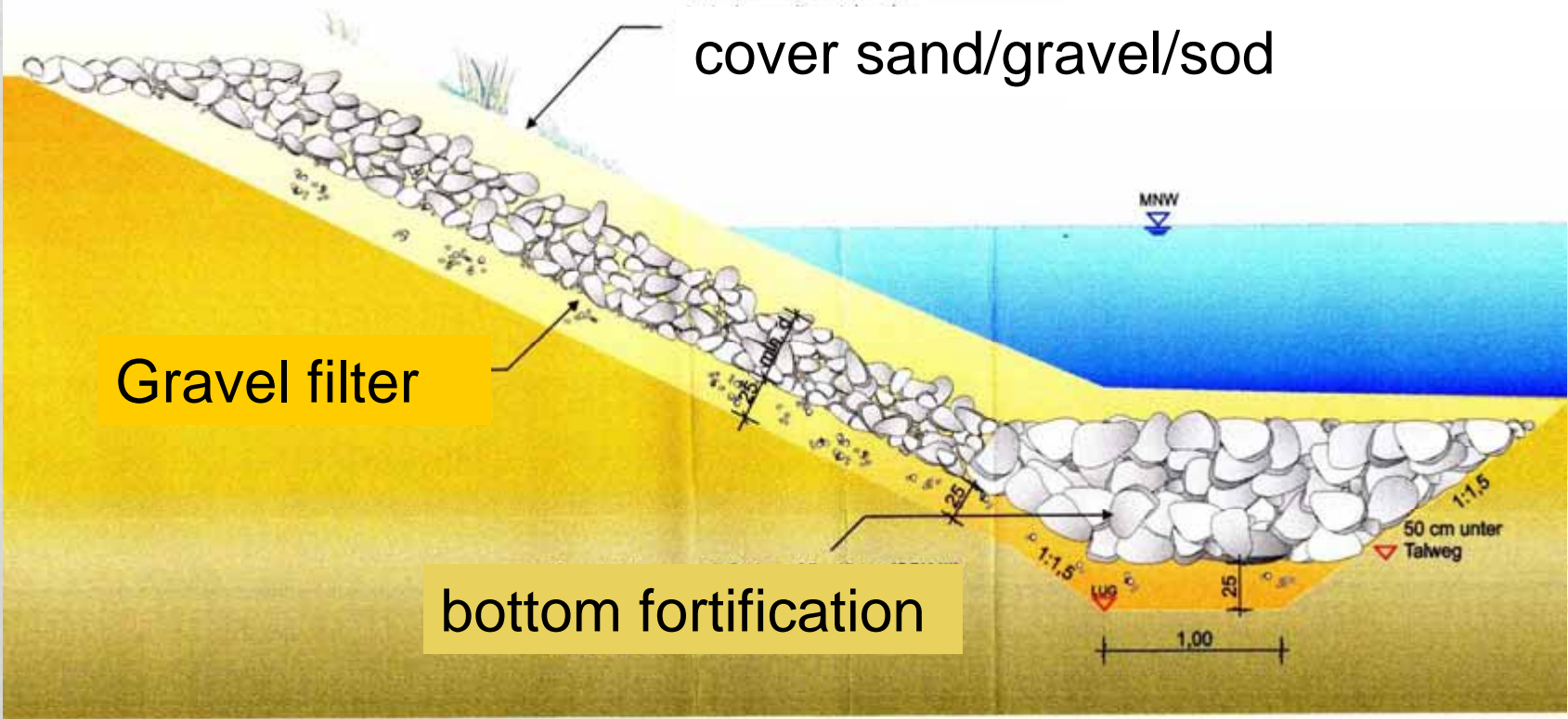


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bank structure, usual detail:



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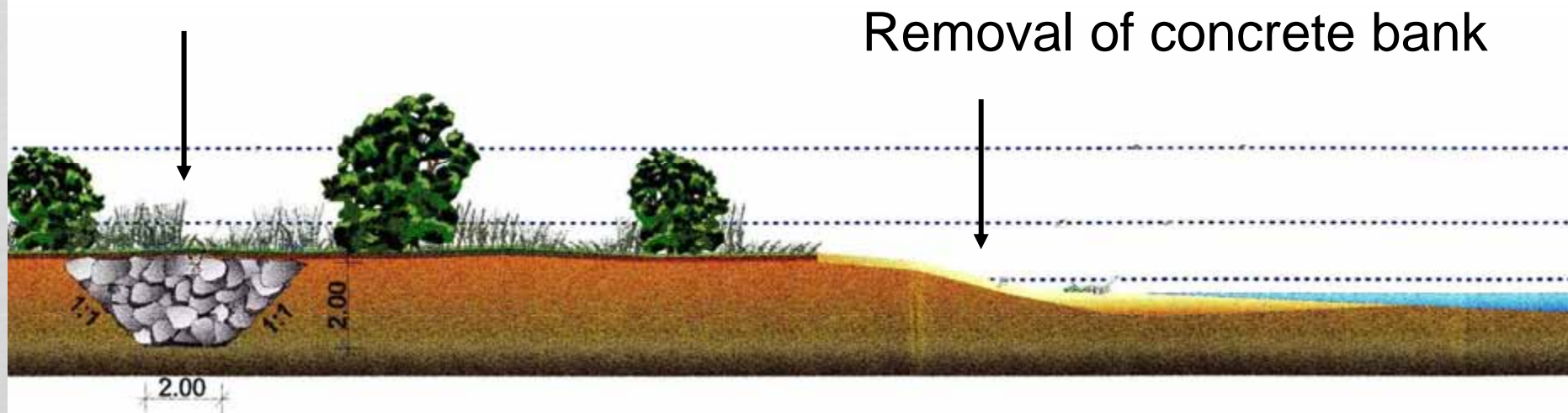


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Restored Bank

Space for morphological processes

Backward „hidden“ protection



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now a (restored) river



Gravel banks, riffles and pools
Natural river slopes
River bottom rock ramps / slides
Fish bypasses
New habitats for flora and fauna
Attractive recreation areas

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Summer in the city

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Urban river adventures



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Measurements:

- Widening the riverbed from 50 m up to 90 m
- rebuilding banks (flattening, fixing and covering with gravel)
- rebuilding river barriers / sills



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Fish ladder

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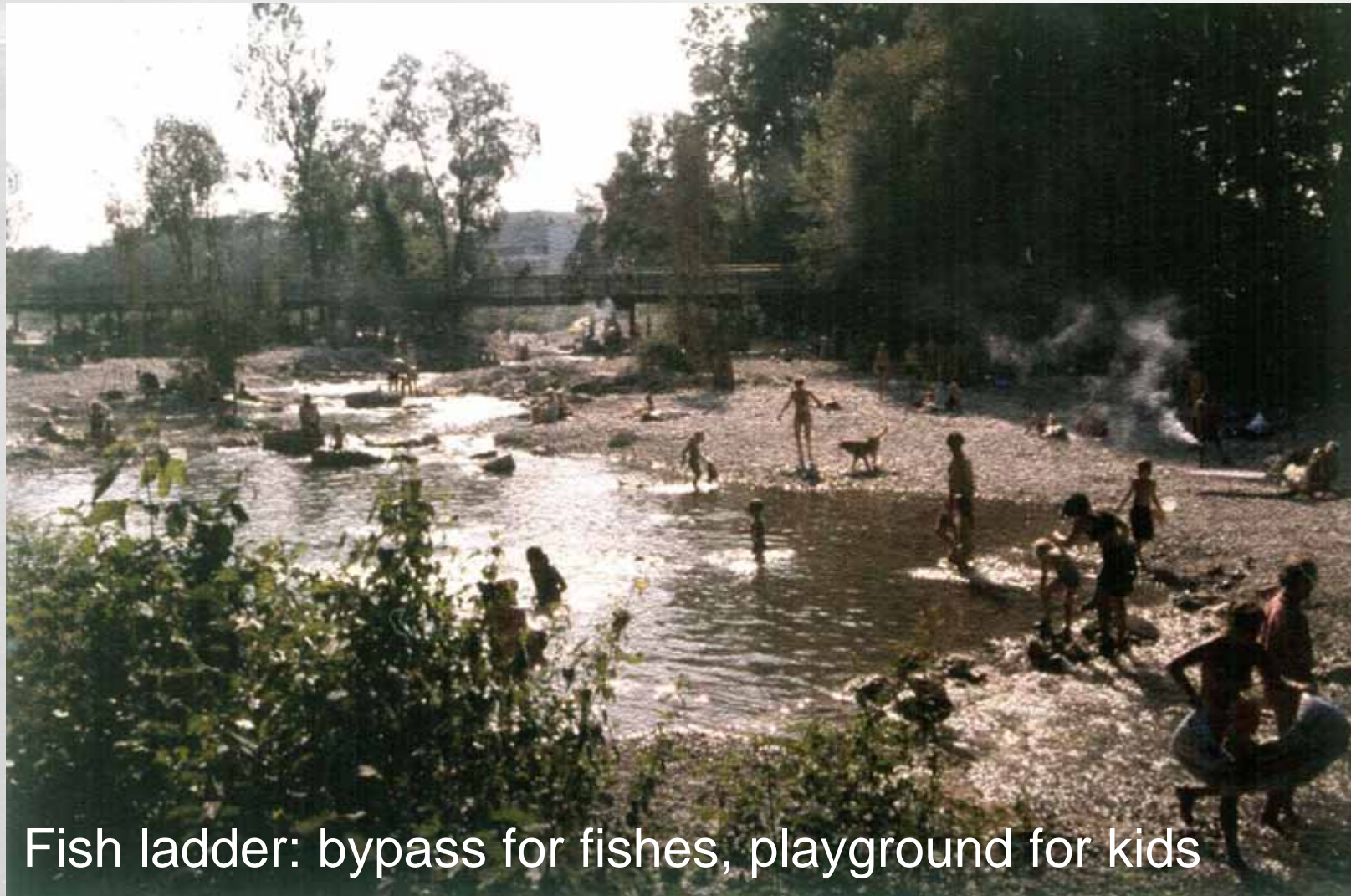
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Fish ladder: bypass for fishes, playground for kids

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Measurements:

- Widening the riverbed from 50 m up to 90 m
- rebuilding banks (flattening, fixing and covering with gravel)
- rebuilding river barriers / sills
- Enhancing dykes



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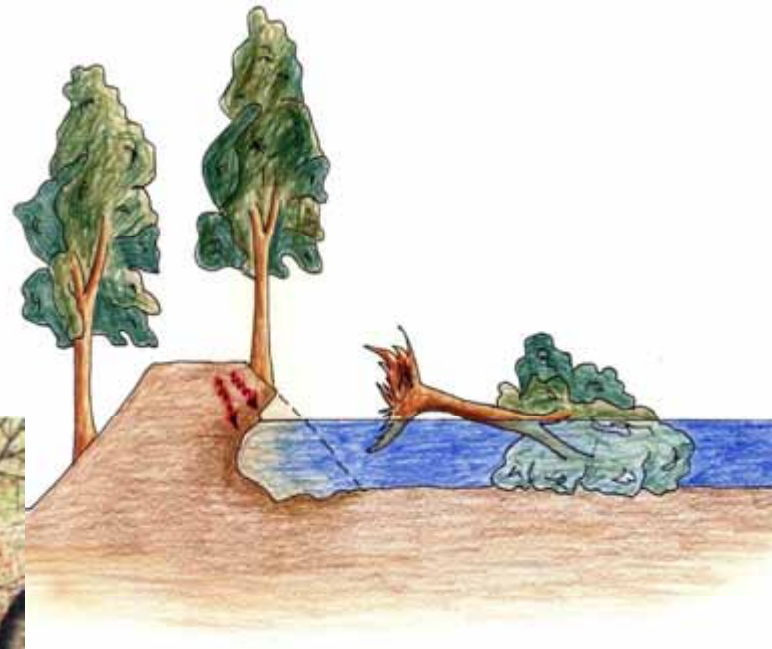


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Falling over

Failure

Flooding



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Enlarging and clearing from trees (under construction)

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1 Year after the Measurements

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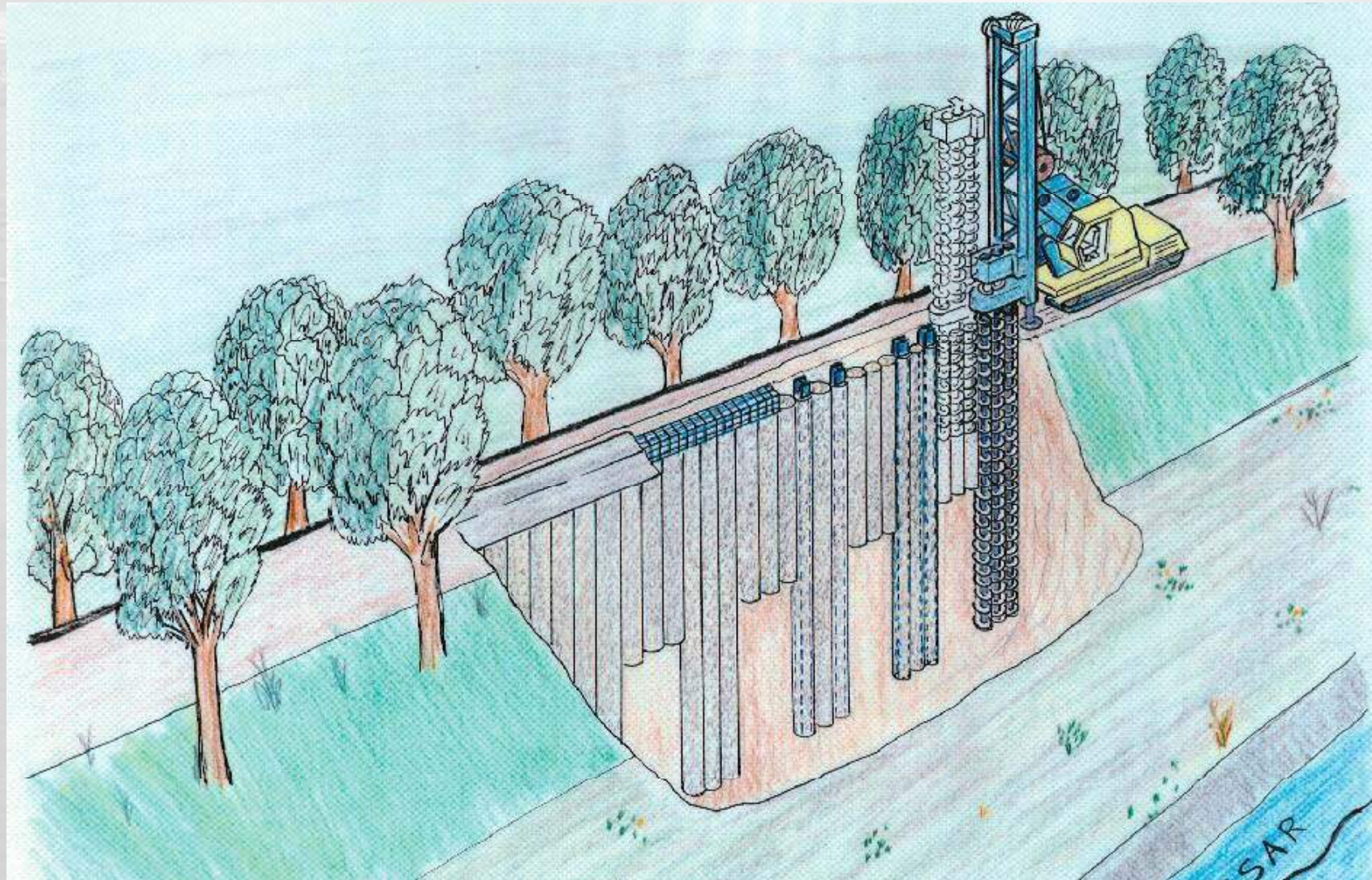
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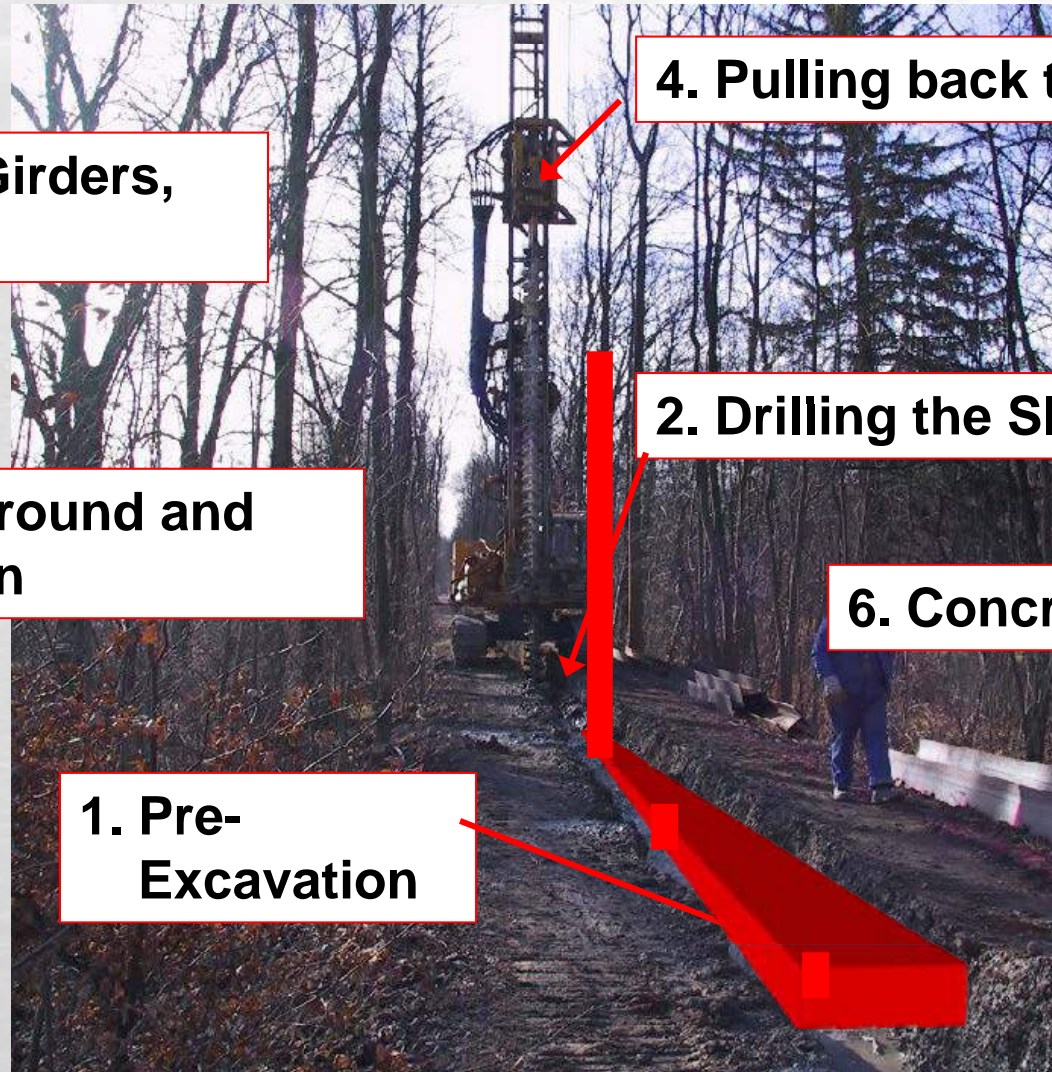
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5. Installing Girders,
 $a = 3,0 \text{ m}$

4. Pulling back the Drill

3. Mashing Ground and
Suspension

2. Drilling the Slot

6. Concreting the Top

1. Pre-
Excavation

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FAQs

- Total length ca. 8 km
- Begin of construction 2000
- Finish in June 2011
- A Project in corporation by the State of Bavaria and the City of Munich
- costs: 35 Mio. €

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Catch the Wave!

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