Bavarian State Ministry of the
Environment and Consumer Protection

„Isar Plan“ in Munich,Bavaria

Flood Protection, Restoration, Recreation

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AGENDA

- Isar-Plan: history and concept
- Principle approach and measures: „Learning by doing“ and „lessons learnt“
- Conclusions

Isar River sections

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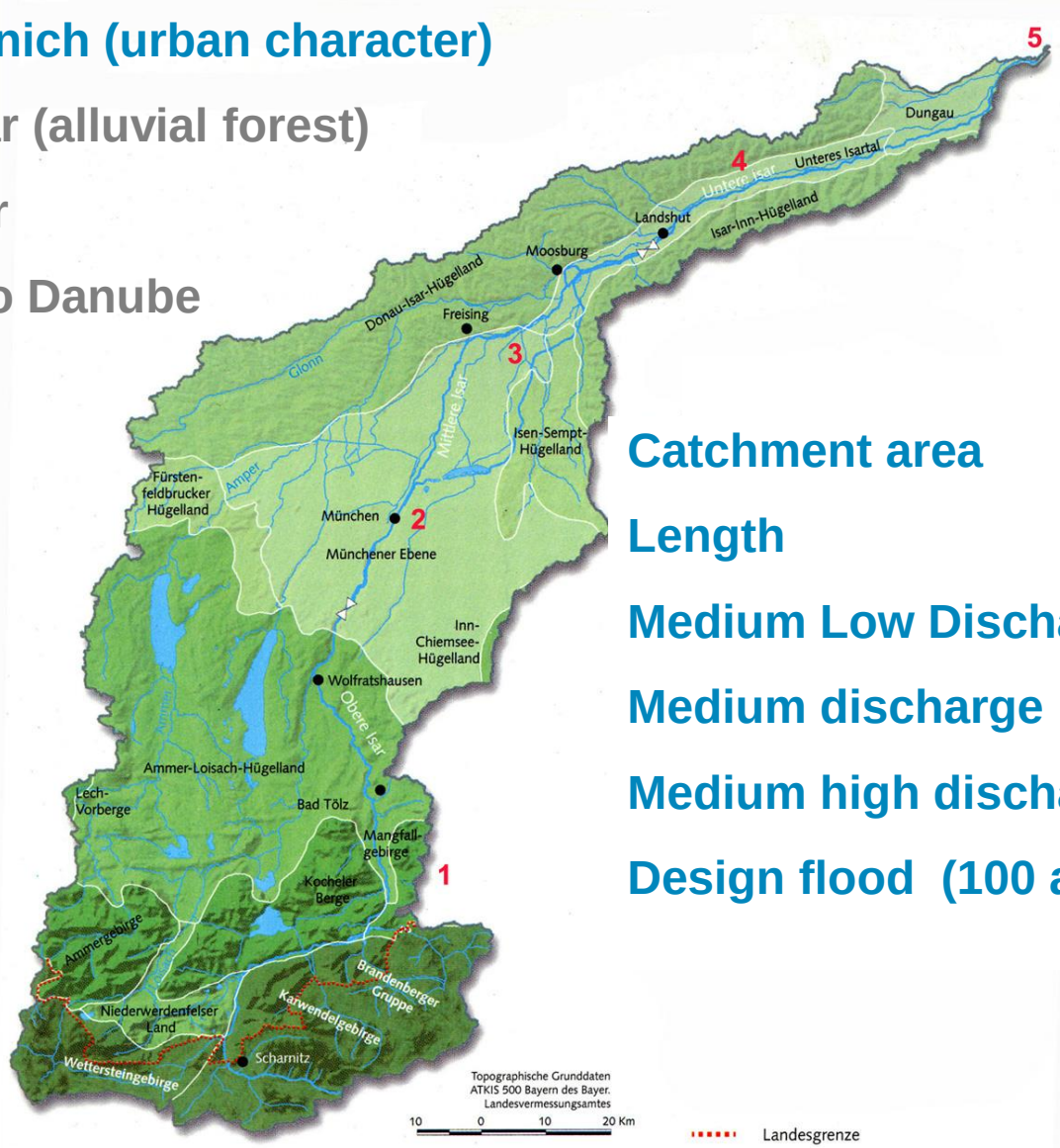
1 Upper Isar (alpine Character)

2 Isar in Munich (urban character)

3 Middle Isar (alluvial forest)

4 Lower Isar

5 Mouth into Danube



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

Isar-Plan – fact sheet

- Total length of river stretch ca. 8 km
- Start of planning 1995
- Begin of construction works in 2000
- finished in 2011
- A Project in corporation by the State of Bavaria and the City of Munich
- Expenses: about 35 Mio. €

Job completed:
View before Restoration in 1999

After all: Urban Flood plain area remained

Major pressures and impacts of„civilized“ Isar River

Pressures + Drivers

- Flood risk: canalized,dammed
- Hydropower: Water abstraction, diverted, drained
- Sewage: degradated minor water quality
- Physical interruption: lack of longitudinal continuity

Impact

- Reduced floodplain
- Decline of morphological processes, linear erosion
- Loss of ecological functions, habitats and groundwater interaction
- Disturbed interaction between river bed and surrounding landscape
- No access to waterline

Integrated Planning concept

Flood protection

Revitalization

Recreation

Project objectives in detail

- **Flood Control**
  - Enlarge Water Retention Capacity
- **Restoration, revitalization**
  - Ecological Upgrading
  - Enhance Morphological processes
  - Longitudinal and lateral continuity
  - Natural habitats, biodiversity, water quality
- **Recreation**
  - Access to waterline, water activities
  - Attractive landscape and views

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Reference status:

„Flaucher“ in Munich

Measures

- Reinforcement of dikes
- Removal of concrete embankments
- Enlarging the cross section
- Bottom rock ramps and fish pass to improve biological river continuity
- Interactions water to land

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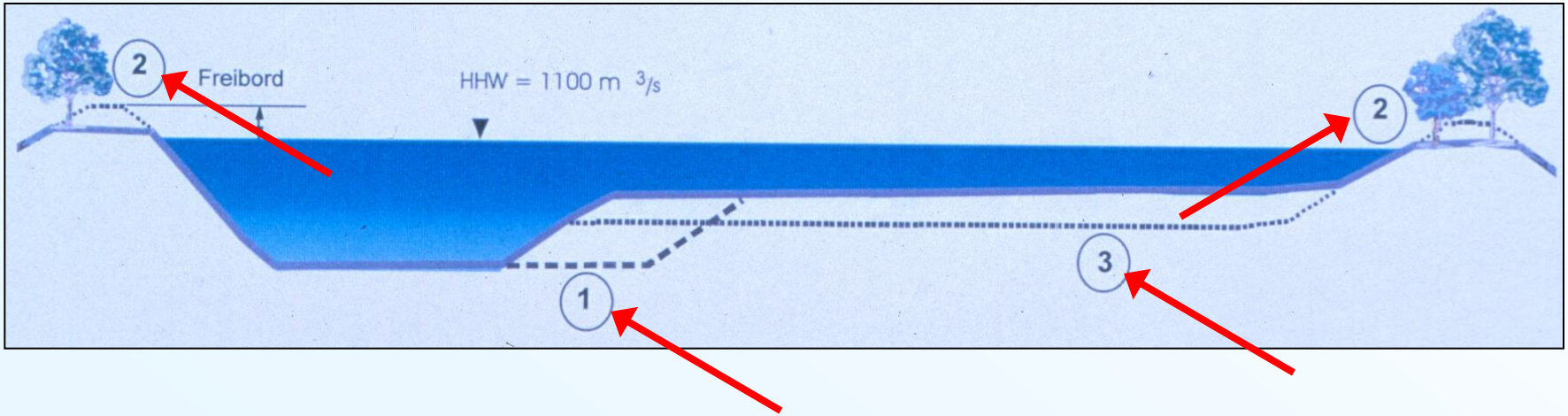
Improvement of flood control: Century Flood in 2005

Improvement of Flood control by

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




. . . view 1 year after restoration
• Gravel banks, riffles and pools
• Natural river banks
• Dynamic river processes
• New habitats for flora and fauna
• Attractive recreation areas

River banks

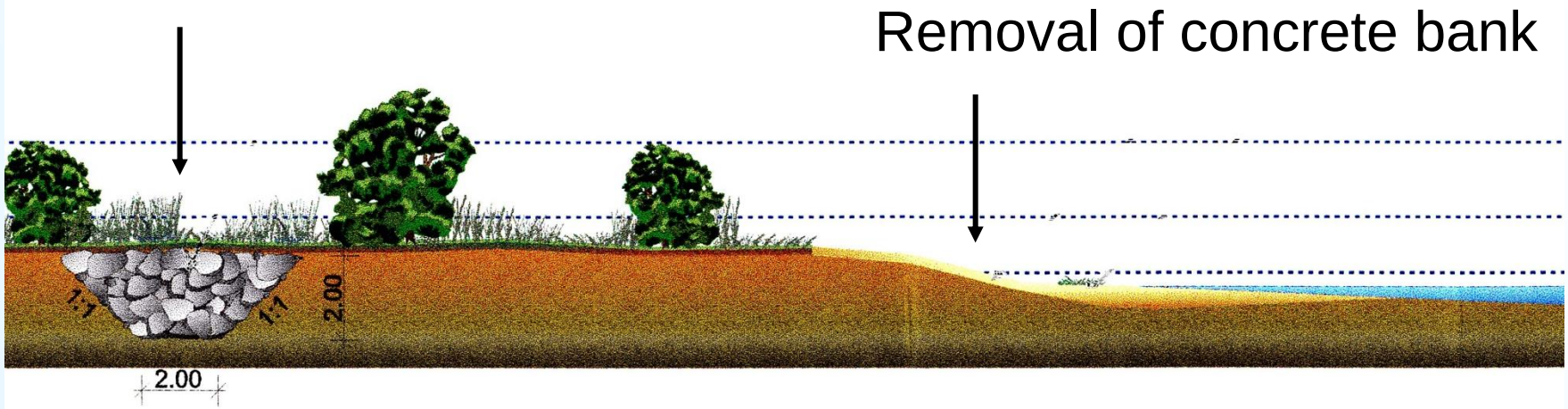
Before . . .

and after

Restored Bank

Space for morphological processes

Backward „hidden“ protection

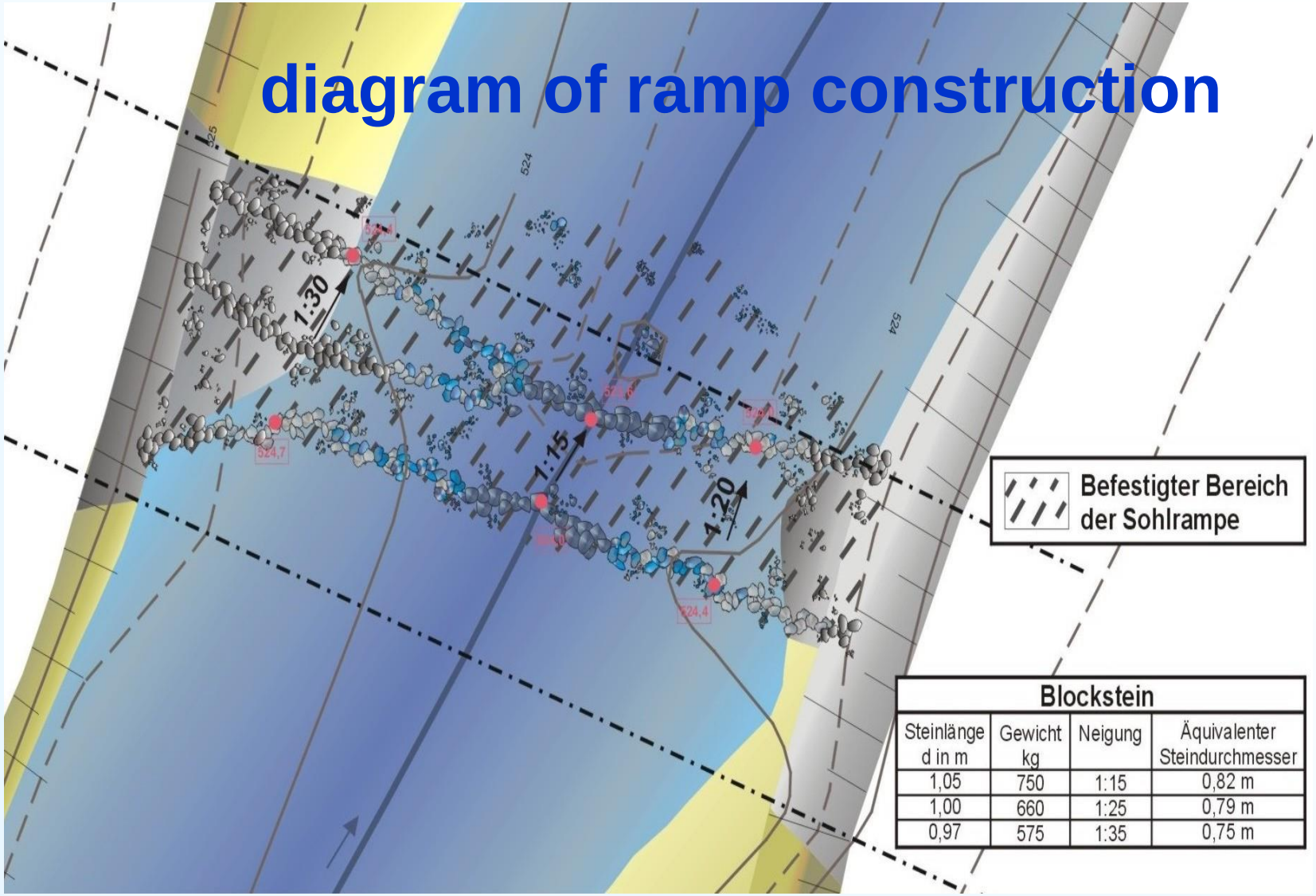


Dynamic River Bed Processes


New structures after the flood in 2005:
New pools and scenery

River Bottom Ramp

diagram of ramp construction



Blockstein

Steinlänge d in m	Gewicht kg	Neigung	Äquivalenter Steindurchmesser
1,05	750	1:15	0,82 m
1,00	660	1:25	0,79 m
0,97	575	1:35	0,75 m

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Close to nature fish pass at Flaucher

Improving Hygienic Water Quality enables seasonal swimming activities

Reduction of bacterial loads through UV radiation of sewage plant outflow during season

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Urban Recreation:
Attractive landscape and Access to waterline

drone photographs reflect the current state of art

Urban Restrictions remain, but can be handled

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„Urban nature design“

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Nature, people, urban culture: Isar adventure in Munich of today

Conclusions

- Adequate space for dynamic processes
- Integrative planning concept
- Teamwork + Participation (Public, NGOs)
- Ambition, Time and Patience


a lot is possible, catch the the wave,
thank you for your attention!!