Restoring river-floodplain interconnection and riparian habitats along the embanked Danube between Neuburg and Ingolstadt (Germany)

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Project area
Historical background

Since 1830 embankment and straightening measurements

Since 1970 barrages of Bergheim and Ingolstadt
Status quo

- 2.100 ha
- high biodiversity (habitats and species)
- FFH-/SPA-area
softwood riparian forest

hardwood riparian forest

calcareous grasslands

ruderal habitats
Status quo

- No river continuity

- No water and soil dynamics in the floodplain, no connection between river and floodplain (except from flooding > 1.300 m³/s)

- Partly high groundwater level

- Change of vegetation from typical riparian and floodplain species to terrestrial or wetland species

- Lost of dynamic ruderal habitats (ox-bows, gravel banks, undercut slopes …)
Former dynamics still readable

*Laser DTM, resolution 2 m*
The project

Idea

Hydrological process is key process for:
• morphological dynamics and
• water dynamics
→ therefore it is a precondition for vegetation and fauna

Aim

• Bring back dynamics to the floodplain and
• Reconnect floodplain and river

In charge

Water-Management Authority Ingolstadt
The project: Bypass Bergheim barrage

Effects

- river continuity
- hydromorphological dynamics
- new riparian and aquatic habitats
- improved groundwater dynamics

Technical data

- permanent flow of 0.5-5 m³/s
- total length 9 km
- new water course or temporary water bodies
The project: Bypass Bergheim barrage
Technical data

- runoff up to 30 m³/s during peak discharge of the Danube (600-1000 m³/s)
- 2 or 3 times a year, duration 5-10 days
- main flowing of water is along the bypass, return at different sites
- man-controlled

Effects

- more frequent floods adjusted to the Danube
- improved groundwater dynamics
- restoration of floodplain habitat relicts
- development of new floodplain habitats
Natural floods: Danube more than 1.300 m³/s
New dynamics

Natural flood

Man-controlled flooding (up to 30 m³/s)

Bypass permanent water course (ca. 2-5 m³/s)
The project: temporary drainage

Technical data
- new drainage channel in the water storage area of Ingolstadt
- two locks of the return courses of the new river, sluice in the dike
- man-controlled, during low water level of the Danube

Effects
- temporary drawdown of permanent high groundwater level
- the „adequate“ water level is part of the research program
- restoration of floodplain habitats instead of wetland habitats
Floodplain Institute Neuburg/Danube
Task Force „Monitoring of floodplain-ecological processes“

Cath. University Eichstätt-Ingolstadt

Component II:
Fluvial morphodynamic, Soil moisture and Groundwater

University Weihenstephan-Triesdorf

Component III:
Monitoring of Vegetation

University Osnabrück

Component IV:
Transformation of water and riparian vegetation

Cath. University Eichstätt-Ingolstadt / Floodplain Institut Neuburg

Component I:
Project management

Technical University München / Bavarian Academy of Forestry

Component V:
Tree species development and Vitality

Technical University München

Component VI:
Survey and Monitoring of floodplain fauna

University Weihenstephan-Triesdorf / Cath. University Eichstätt-Ingolstadt

Component VII:
Biodiversity and environmental education
Thank you for your attention!