

The Luppe project in Leipzig - Floodplain restoration in Germany - a multifunctional approach to implement nature-based solutions

leben.natur.vielfalt
das Bundesprogramm

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Interreg - Workshop: Building water resilience in times of floods and droughts

Murcia, Spain

26.02.2025

Photo: Mathias Scholz



Stadt Leipzig
Amt für Stadtgrün und Gewässer



Stadt Schkeuditz

Introduction

Leipzig's Urban Floodplain Forest



- "green backbone" and serving as vital blue-green infrastructure for over 700,000 residents of Leipzig and neighbouring cities.
- one of the largest urban floodplain forests in Central Europe, rich in biodiversity.
- The natural hardwood forests are part of the Natura 2000 network, with high biodiversity.
- Big challenges for restoration

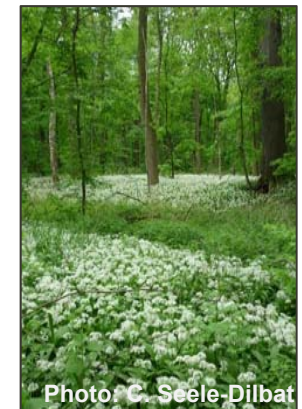
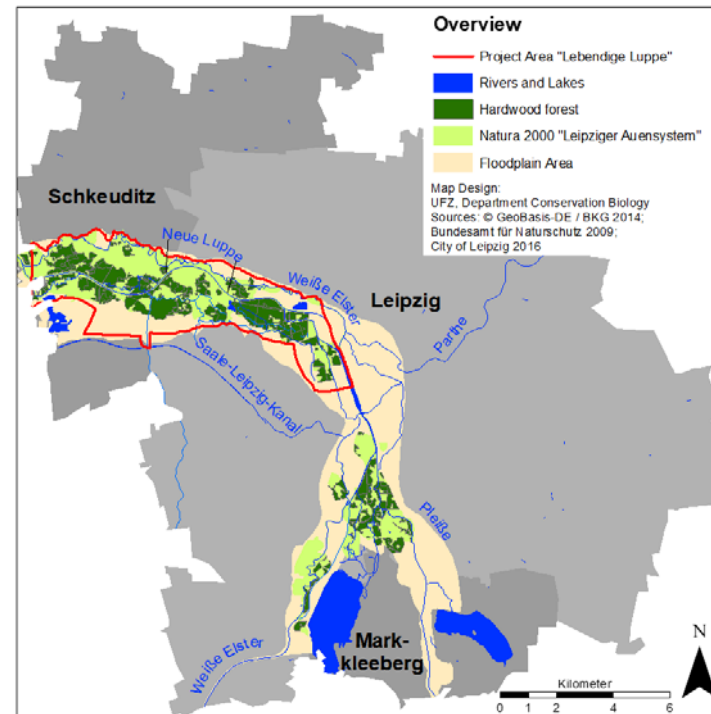
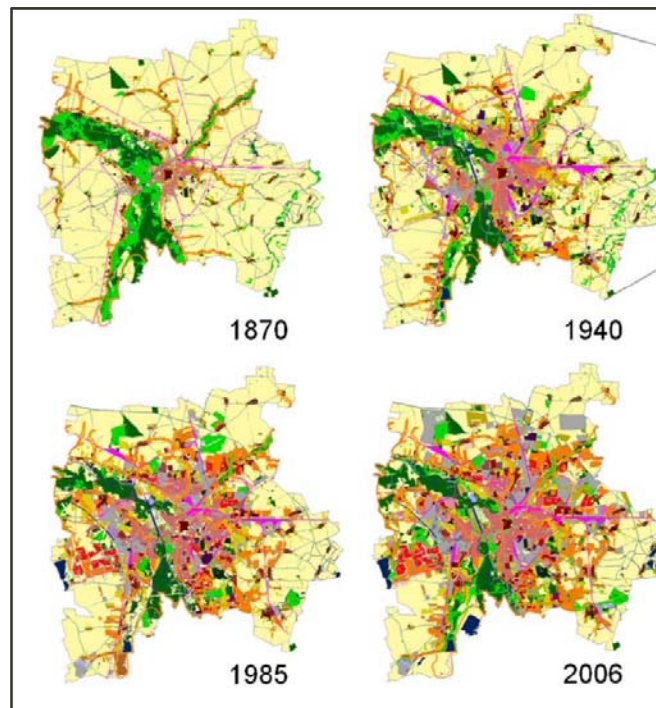
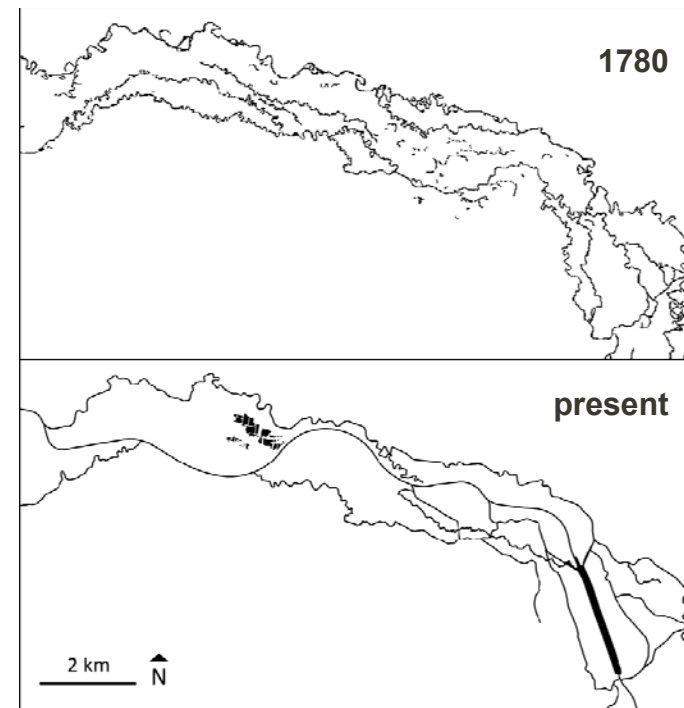


Photo: C. Seele-Dilbat

Anthropogenic changes of the floodplain system



Haase & Gläser 2009



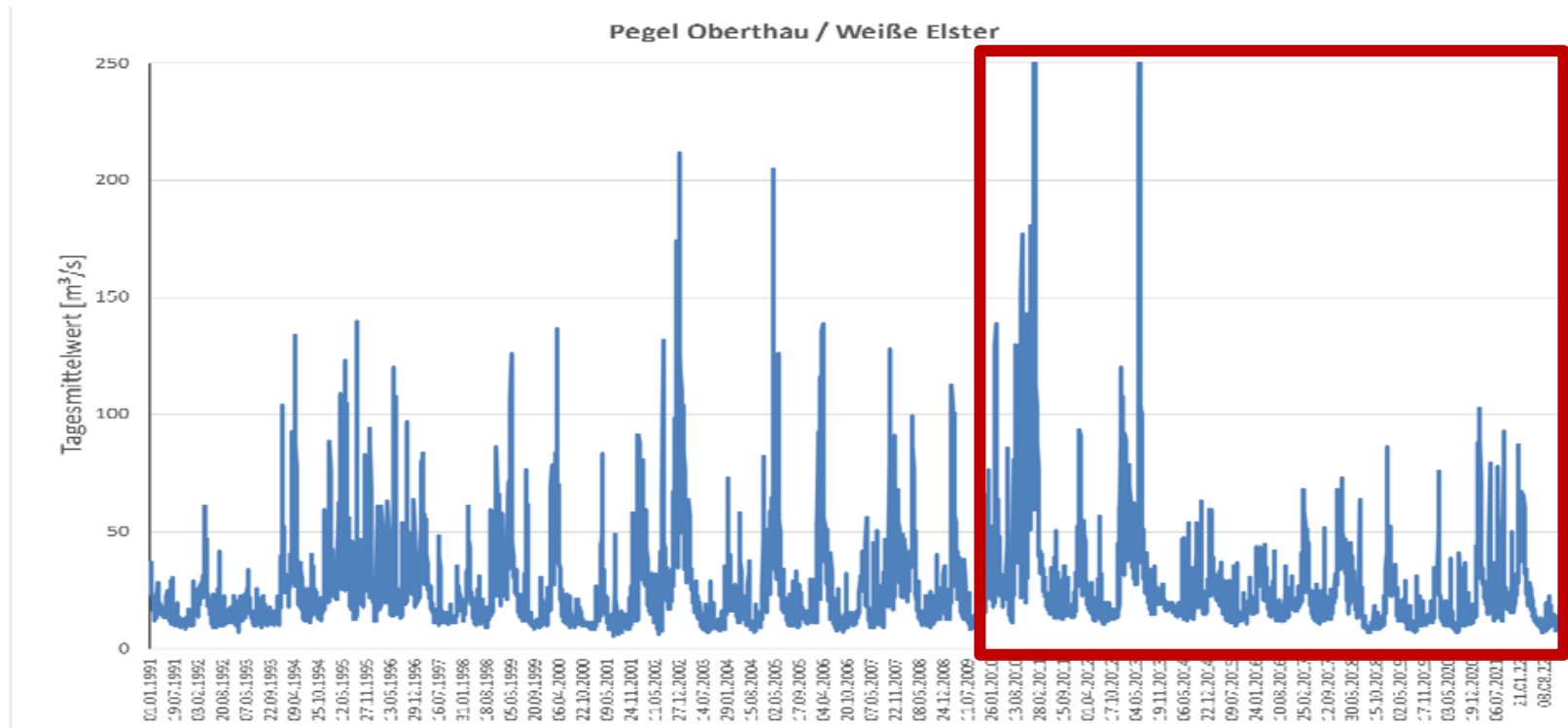
modified from Wolf 2011



Haase, D., Gläser, J. (2009): Determinants of floodplain forest development illustrated by the example of the floodplain forest in the District of Leipzig For. Ecol. Manage. 258 (5), 887 – 894. <https://doi.org/10.1016/j.foreco.2009.03.025>



River discharge / climate change



Data: LHW, Graph: Büro Koenzen & Pro Aqua, City of Leipzig



Lebendige Luppe Project:

New water on old river courses:

Floodplain revitalization between Leipzig and Schkeuditz



Situation today....



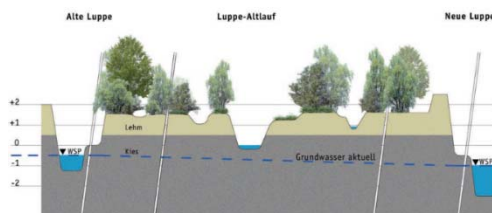
Current situation: Neue Luppe
(Photo: City of Leipzig)

Solution....



Intended situation: A dynamic water body
(Photo: City of Leipzig)

Planned measures of river revitalisation within the green corridors



Current situation: Groundwater table
(Source: bgmr)



Intended situation: Groundwater table after completion of the scheme (Source: bgmr)

- General goal is the revitalisation of more than 16 km of former river courses
 - Reconnection of dried-up river arms
 - Inundation of at least 30 % of the floodplain area via the new rivers
 - Raising the groundwater table

Old and New Problems and Risks with Epidemics



Photo: A. Künzelmann, UFZ

- Ongoing elm disease (*Ophiostoma novo-ulmi*)
- Since 2011 ash dieback (*Hymenoscyphus pseudoalbidus* and *Chalara fraxinea*)
- Since 2018 after severe drought conditions the sooty bark disease on maple (*Cryptostroma corticale*)



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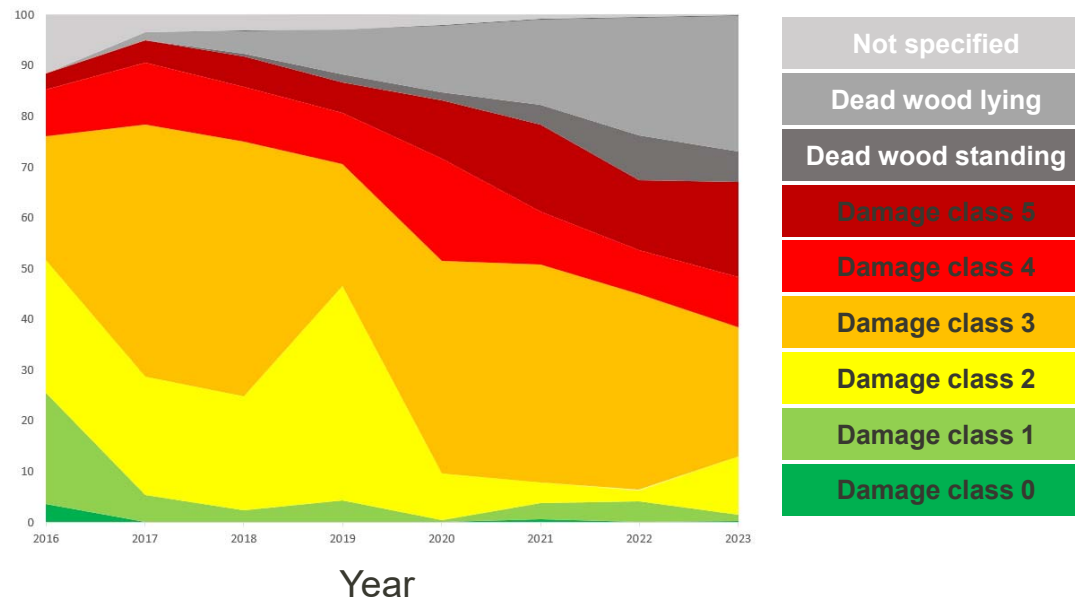


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Monitoring of Ash Dieback

Percentage



Source: Scholz et al. in preparation



Strong increase in ash dieback in the last 7 years

River and floodplain restoration in Leipzig



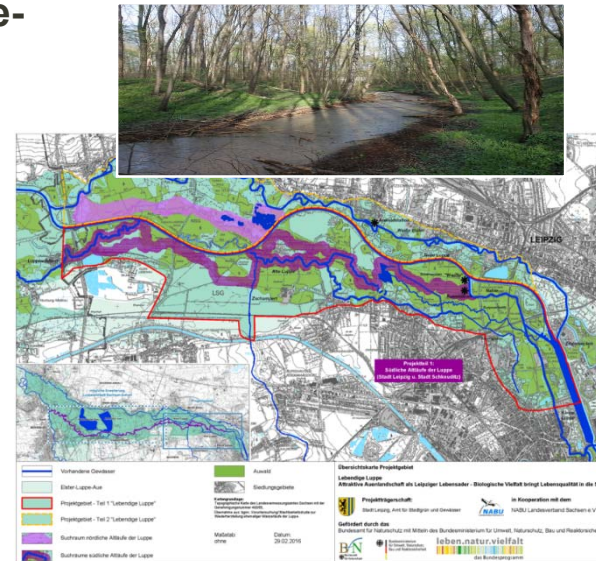
Challenge: loss of former river courses, the New Luppe-Channel is draining the floodplains!

Main measures:

Restoring the old courses of the Luppe (~ 16 km)
reestablish floodplain dynamic / inundation (~10 km²)

Several ecosystem services & functions will be improved:

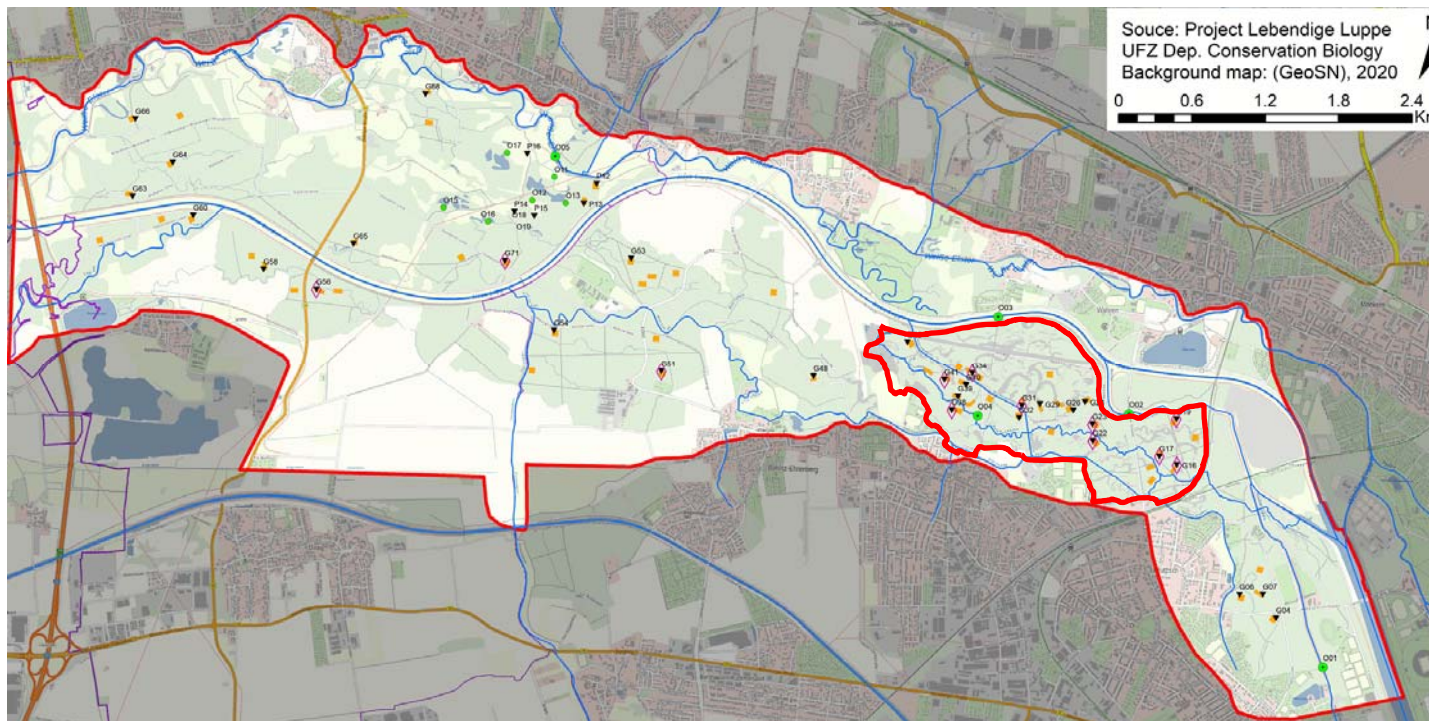
- Habitat quality
- Flood retention
- CO₂ sink
- Recreation
- Nutrient retention



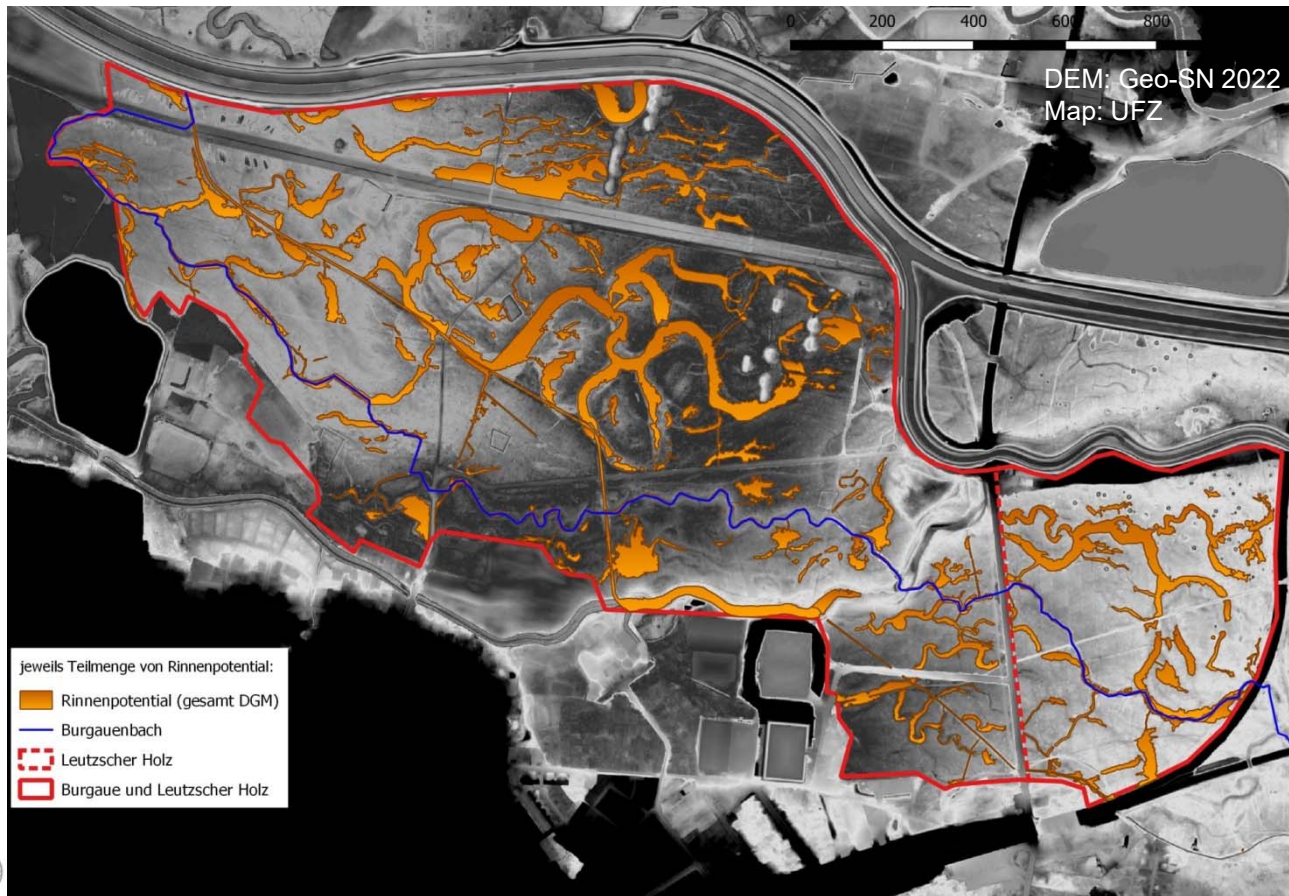
- Joint project with the**
- City of Leipzig
 - City of Schkeuditz
 - NABU Sachsen
 - Helmholtz Centre for Environmental Research – UFZ
 - University of Leipzig



Revitalization of Burgauenbach since 2023



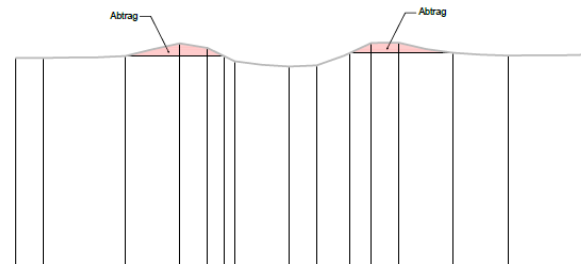
Burgauenbach as first attempt 1998 and old channels/ flooding potential



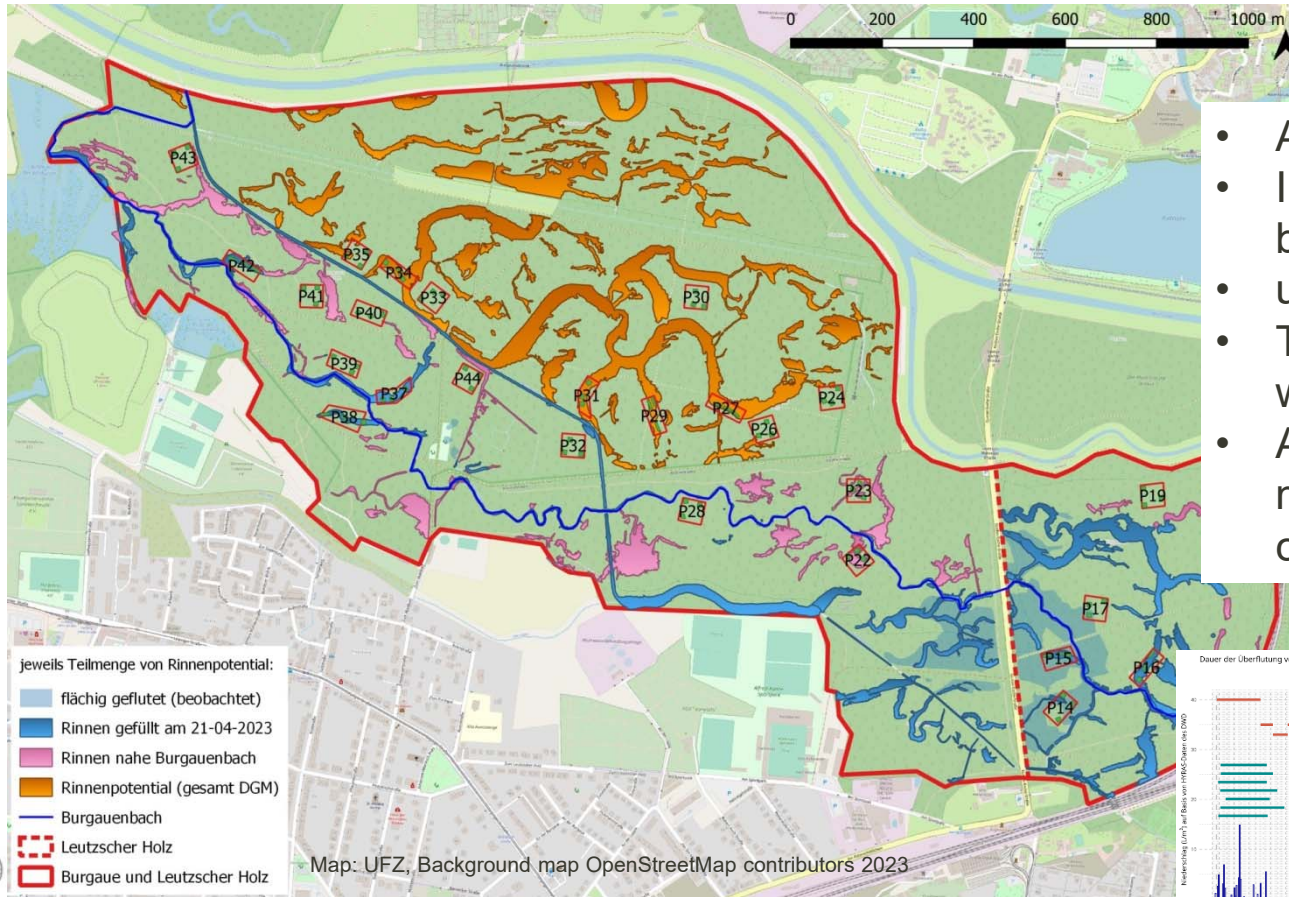
Burgauenbach renewed inlet (March 2023)



Lebendige Luppe - Leipzig floodplain forest



Burgauenbach: increase of inundation area



- Artificial water inlet increased
- Increase of the inundated area by > 20 ha
- up to 30 % of the area
- Temporary raised ground-water table (about 0,5 to 1 m)
- After inundation about 2 month longer humid soil condition

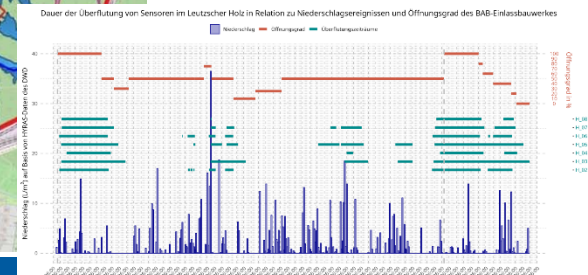


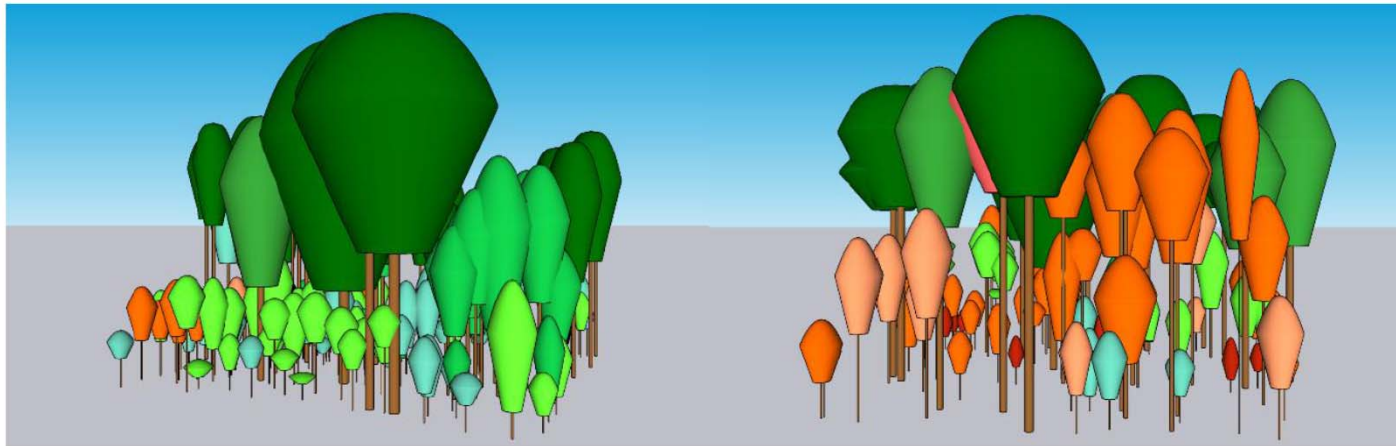


Photo: M. Scholz

First success: small measure but big effects

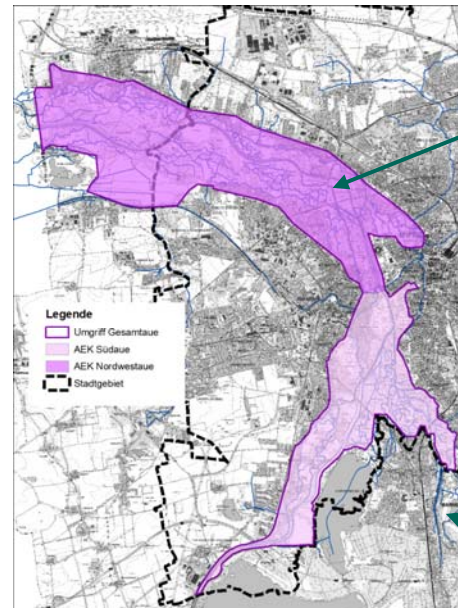


Example Paußnitz flooding: potential tree development after flooding



3D Model of Plots in SketchUp (left flooding) and (right reference without flooding)
(Source: Kasperidus et al. in prep.)

Floodplain development concept



Elster-Luppe-Aue
(Nordwestaue)

Elster-Pleiß-Aue
(Südaue)

Source:
Floodplain development concept for the Elster-Luppe-Aue in Leipzig - Koenzen & City of Leipzig



Floodplain development concept - current situation



Source: Koenzen & City of Leipzig

Floodplain development concept - near future vision



Source: Koenzen & City of Leipzig

Floodplain development concept – final future vision



Source: Koenzen & City of Leipzig

Stakeholder Involvement – a prerequisite

A challenge for planning but also for science



GETTING EVERYBODY ON BOARD

Illustration: Fredrich from HarmoniCOP Handbook 2005:
<http://www.harmonicop.uni-osnabrueck.de/HarmoniCOPHandbook.pdf>



Photos: Lebendige Luppe

Lebendige Luppe - Leipzig floodplain forest



- First success: small measure but big effects
- However the scientific monitoring has to adapt to new planning conditions.
- ESS can support the realisation process, and should be used to show the stressors but also synergies
- Big chance and challenge to meet interest of policy, stakeholders and public
- Work in progress

Flooding of the “Burgau” 04/2023



Photo: M. Vieweg

Sponge Boost

sister projects:



spongeworks

1 case study sites



Azores

🏠 spongeboost.eu
✂️ [@spongeboost_eu](https://twitter.com/spongeboost_eu)
in [spongeboost-project](https://www.linkedin.com/company/spongeboost-project)
📷 [@spongeboost_eu](https://www.instagram.com/spongeboost_eu)

project partners:



SpongeBoost receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement No.101112906. SpongeBoost receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement No.101112906. Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the EU nor the European Climate, Infrastructure and Environment Executive Agency (CINEA) can be held responsible for them.

A photograph showing three people wading through a shallow stream in a lush green forest. They are wearing waders and jackets. The water is clear and reflects the surrounding trees. The forest is dense with tall trees and vibrant green foliage.

Many Thanks

More Information:
www.lebendige-luppe.de
www.spongeboost.eu

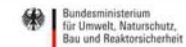
Foto: Carolin Seele –Dilbat / Lebendige Luppe

Many thanks!



Foto: Mathias Scholz

Förderer



Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit



Bundesamt für Naturschutz



Sächsische Landesstiftung Natur und Umwelt
Naturschutzfonds

Projektpartner



Amt für Stadtgrün und Gewässer



NABU-Landesverband Sachsen e.V.



Universität Leipzig



Helmholtz-Zentrum für Umweltforschung (UFZ)



Stadt Schkeuditz

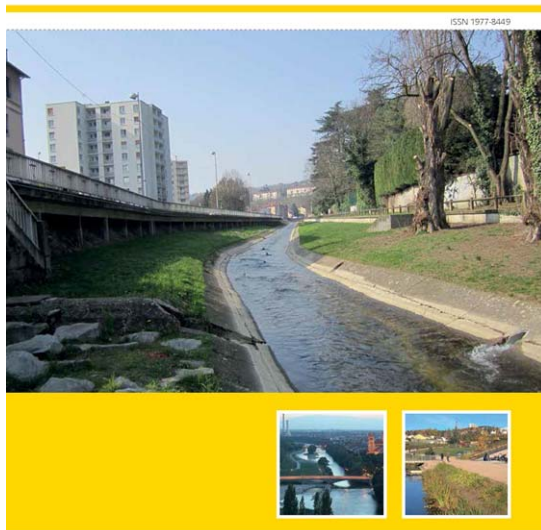
Das Projekt „Lebendige Luppe“ wird durch das Bundesamt für **leben.natur.vielfalt** Naturschutz mit Mitteln des Bundesministeriums für Umwelt, Naturschutz, Bau und Reaktorsicherheit im Rahmen des Bundesprogramms Biologische Vielfalt gefördert. Die „Lebendige Luppe“ ist ein Schlüsselprojekt des Grünen Ringes Leipzig und des NABU Leipzig.

Rivers and Lakes in European Cities – Past und Future Challenges

European overview of best practice cases

EEA Report | No 26/2016

Rivers and lakes in European cities
Past and future challenges



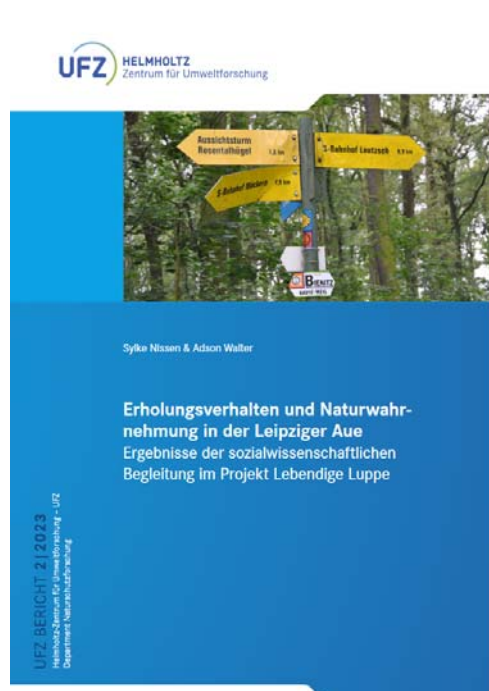
- **Urban rivers and lakes have become increasingly important**
 - **Planning of urban ecology, green / blue infrastructure, climate change adaptation**
- **EU policies for integrated management of urban rivers and wetlands**
 - **Water Framework Directive**
 - **Habitats Directive....**

European Environment Agency 

Source: EEA 2016 - <https://www.eea.europa.eu/en/analysis/publications/rivers-and-lakes-in-cities>

UFZ

Perception of nature in the Leipzig floodplain



Recreational behaviour and perception of nature in the Leipzig floodplain: results of the social science monitoring in the Lebendige Luppe project



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Nissen, S., Waler, A., (2023): *Erholungsverhalten und Naturwahrnehmung in der Leipziger Aue: Ergebnisse der sozialwissenschaftlichen Begleitung im Projekt Lebendige Luppe. UFZ-Bericht 2/2023.* Helmholtz-Zentrum für Umweltforschung - UFZ, Leipzig. 10.57699/v723-0144

