

NOT JUST A CORRIDOR

Ecological landscape design for the Panke
River in Berlin to improve both the natural
ecosystem and environmental justice

Hylke Warmerdam

June 27, 2023

Urban Ecology and Ecocities graduation lab

river ecosystems

&

environmental justice

The natural landscape



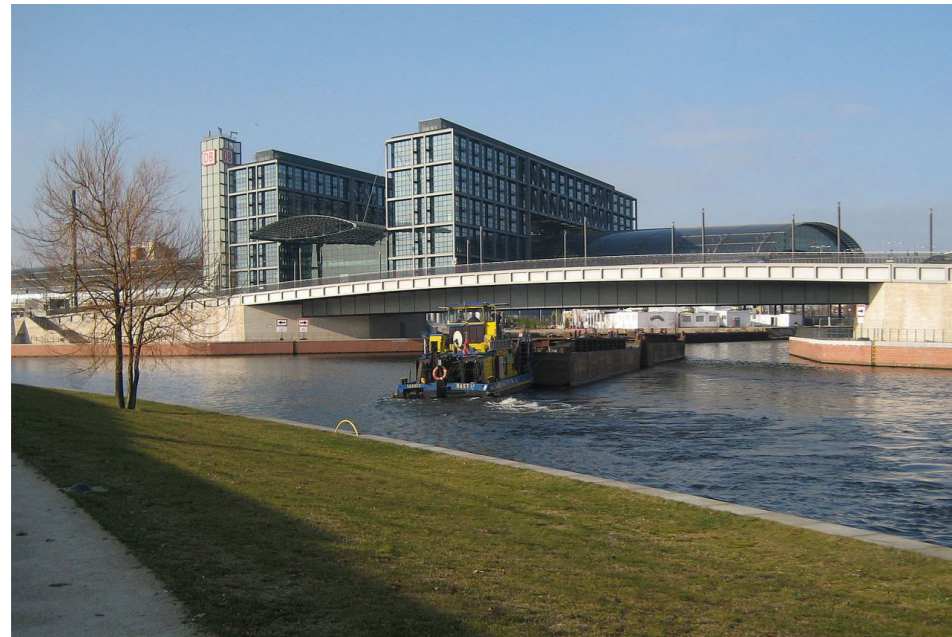
Location of Berlin in the biogeographic region 'continental' (data source: European Environment Agency, 2016)

The natural landscape



Fen meadow landscape north of Berlin (image source: Möllers, n.d.)

Modifications of urban rivers



(image source: Beek100, 2008)

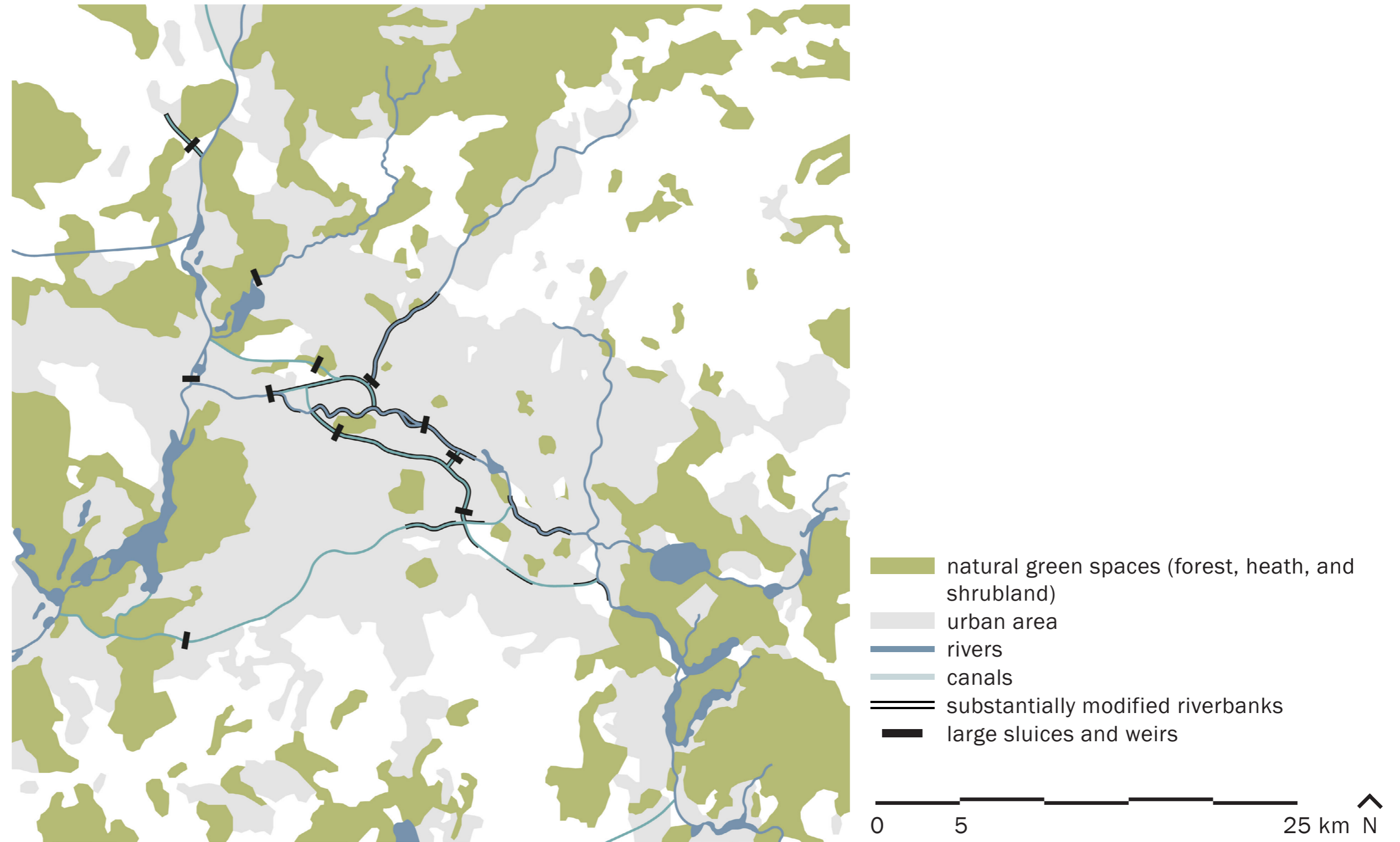


(image source: Mauruszat, 2007)

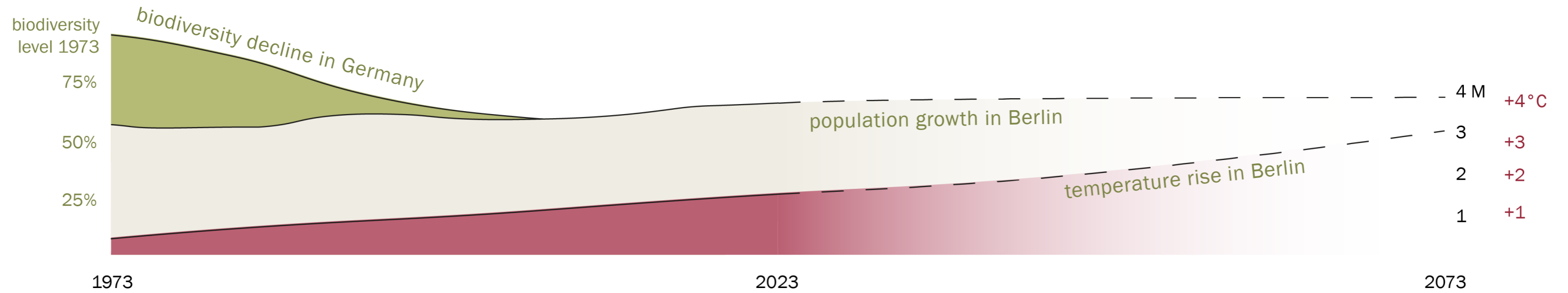


degraded ecosystems

The degradation of river ecosystems



Developments in Berlin



Biodiversity level compared to 1970 (data source: Heinrich Böll Stiftung, 2019), population growth 1973-2040 (data sources: Senatsverwaltung für Stadtentwicklung, Bauen und Wohnen, 2022; Amt für Statistik Berlin-Brandenburg, n.d.) and annual average daily highest temperature, change opposite to the average of 1970-2000 (data source: Senatsverwaltung für Stadtentwicklung und Umwelt, 2016)

The problem of environmental justice

Distributive justice,

“spatial distribution of environmental risks and amenities and the resulting disparities among socioeconomic and racial groups”¹

procedural justice, and
recognitional justice²

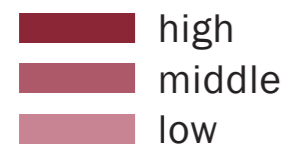


Rosenthaler Platz in Mitte, Berlin (image source: Sehr, 2014); 1: World Health Organization, 2012 in de Vries, et al., 2020; 2: Bennett et al. 2019 in de Vries et al, 2020

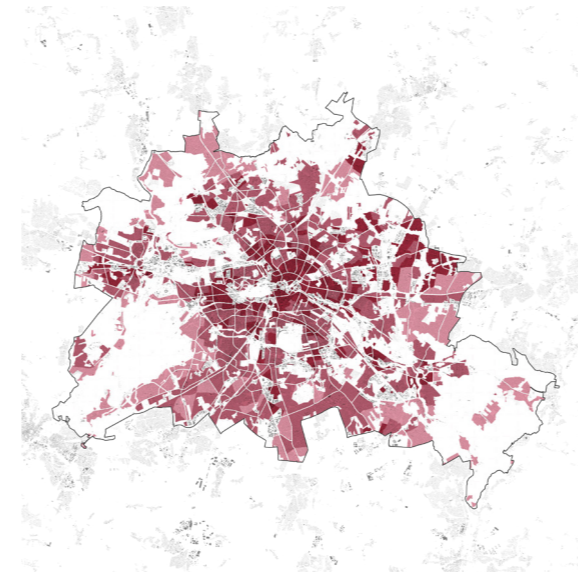
Berlin's environmental justice map



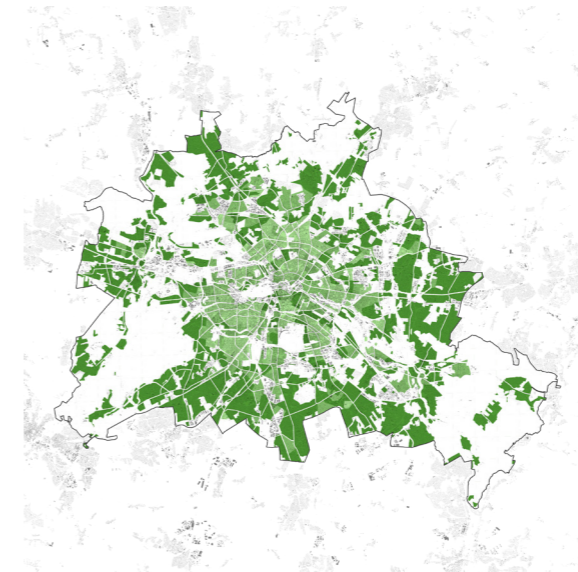
noise pollution



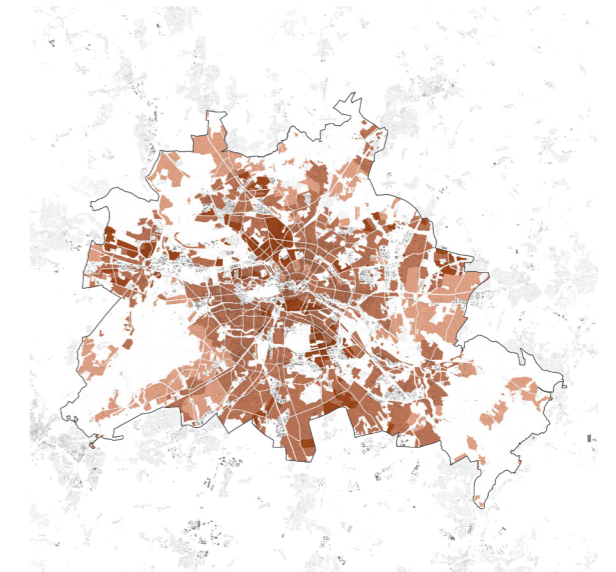
air pollution



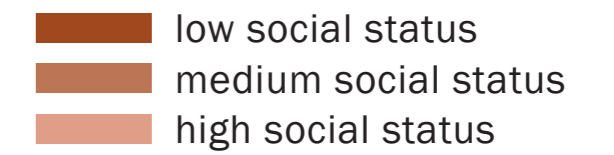
thermal stress



green space supply



social disadvantage



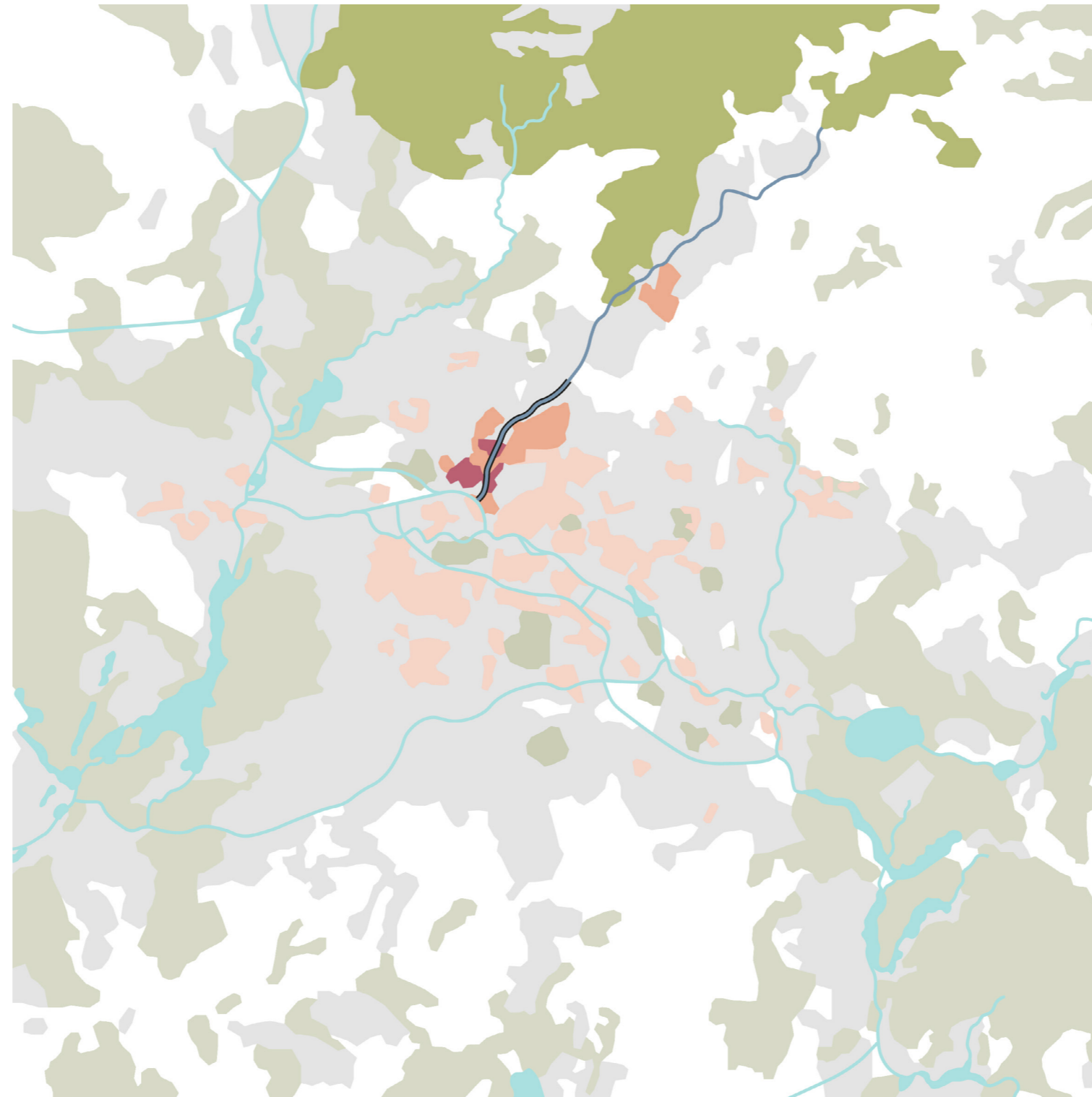
(data source: Senatsverwaltung für Umwelt, Mobilität, Verbraucher- und Klimaschutz, 2022, edited)

Environmental justice in Berlin



(data source: Senatsverwaltung für Umwelt, Mobilität, Verbraucher- und Klimaschutz, 2022)

Research location: the Panke River









ANTENNEN

HERV
Berliner Sport Club

RENOIGIEMUECK20

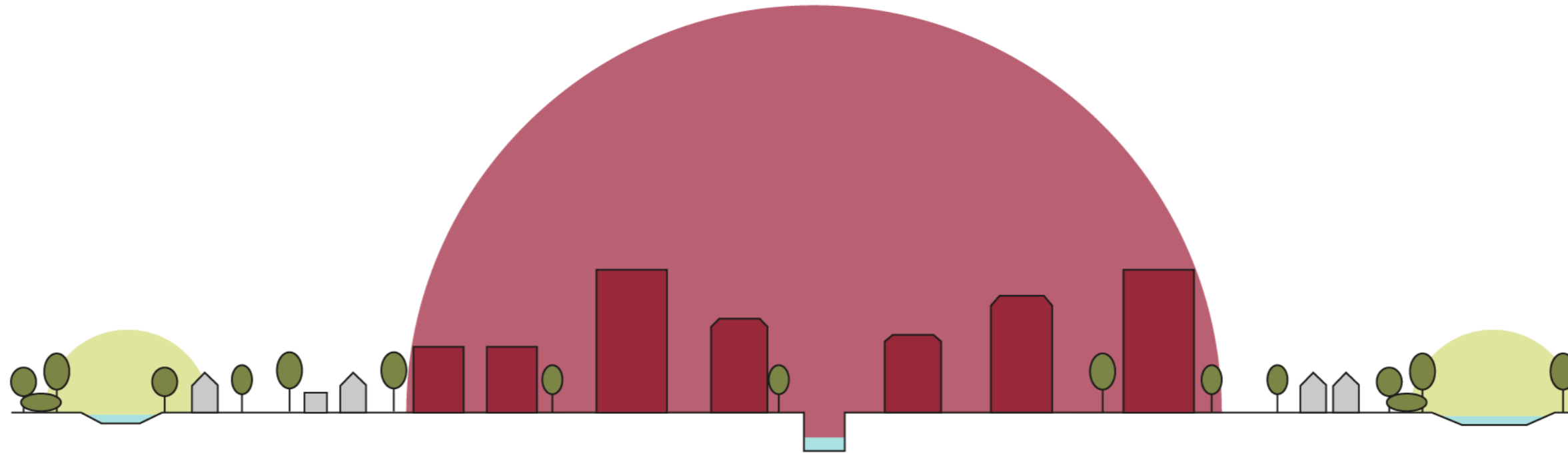
LIBERTÉ
ÉGALITÉ
FRATERNITÉ

Zeit für
Legalisierung!

DC
CA

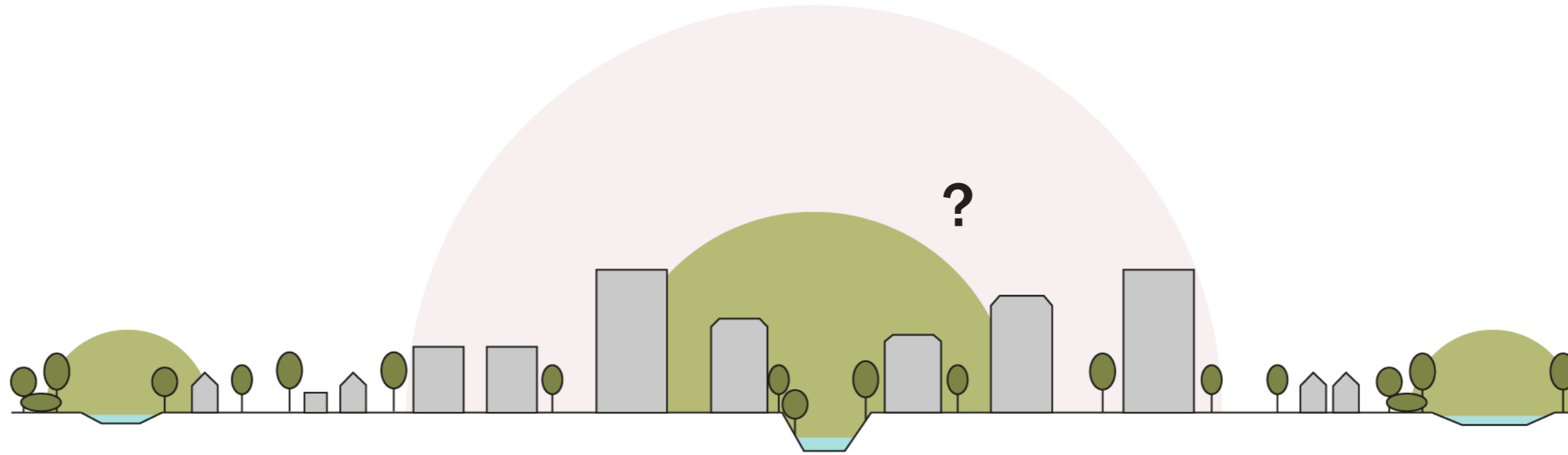
16 MAY 01

Problem statement



The spatial structure of the Panke River in Berlin does not provide optimal conditions for both the natural ecosystem and environmental justice.

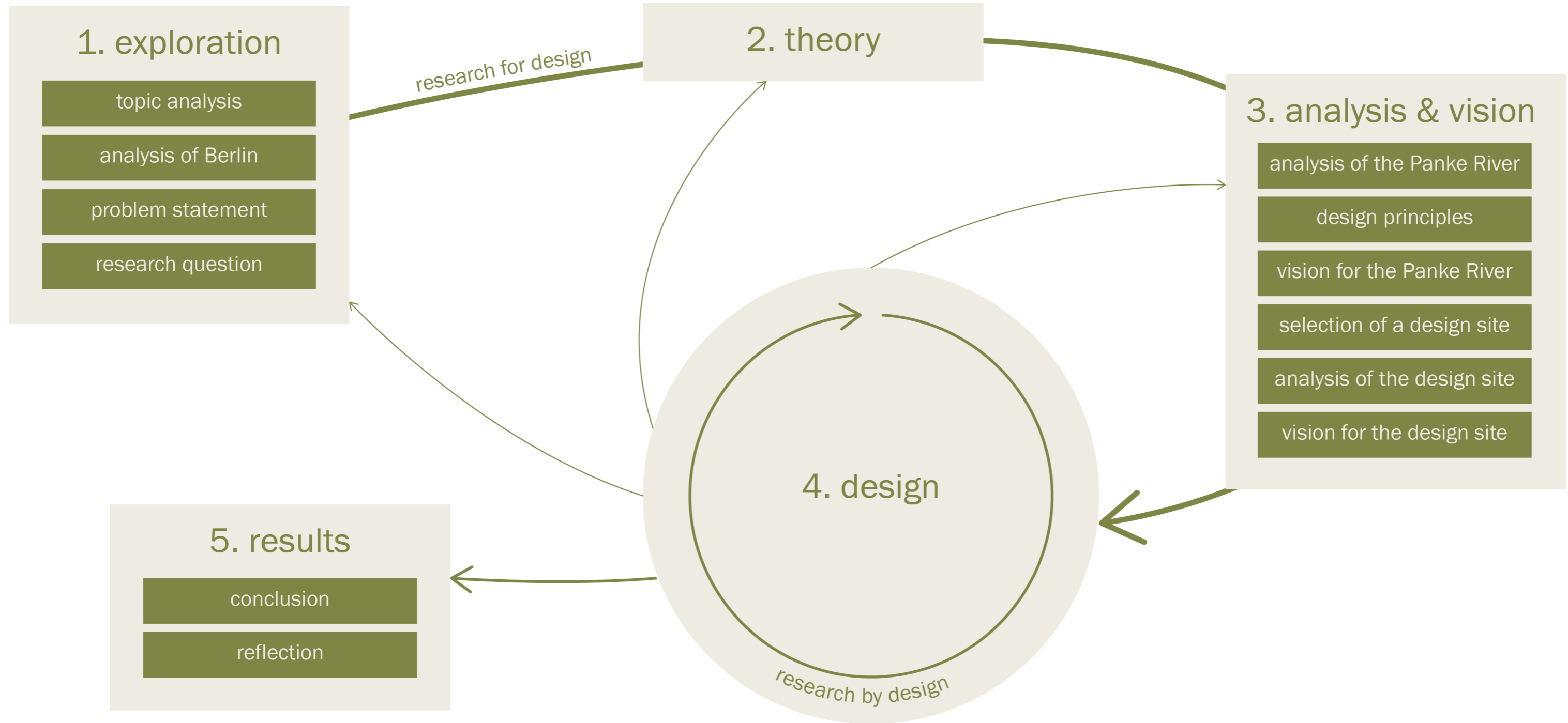
Research question



How can ecological landscape design of the Panke River in Berlin provide optimized spatial conditions for both the natural ecosystem and environmental justice?

Research framework and theory

Research framework

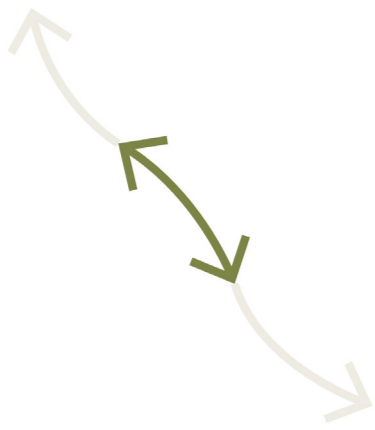


Landscape ecology principles

Dramstad, Forman & Olson (1996)

3-30-300 design guideline

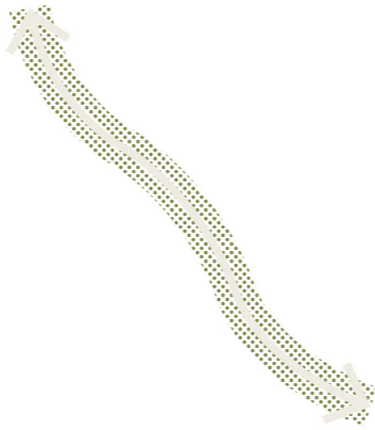
Konijnendijk (2022)



improved connectivity



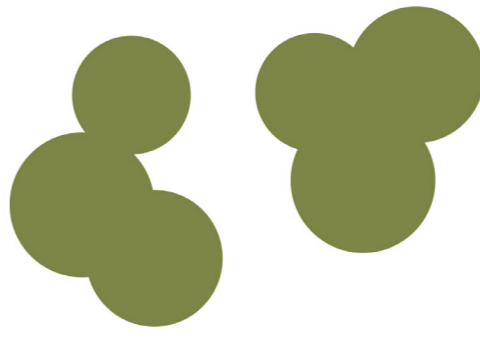
increased width



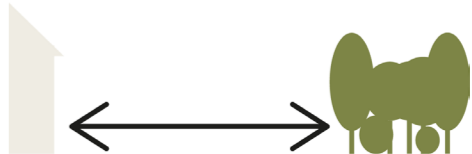
riperian zone



viewing 3 trees



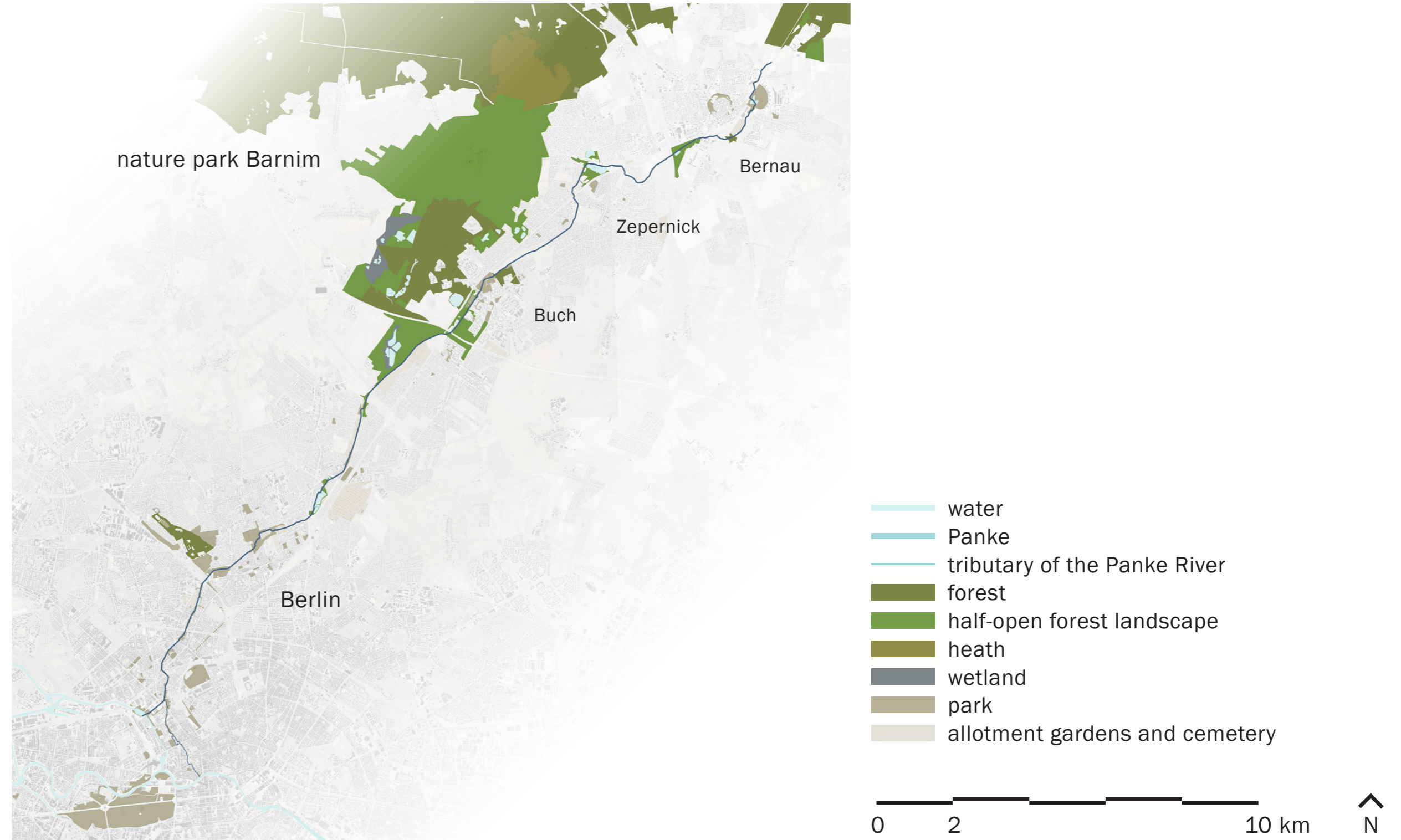
30% tree canopy



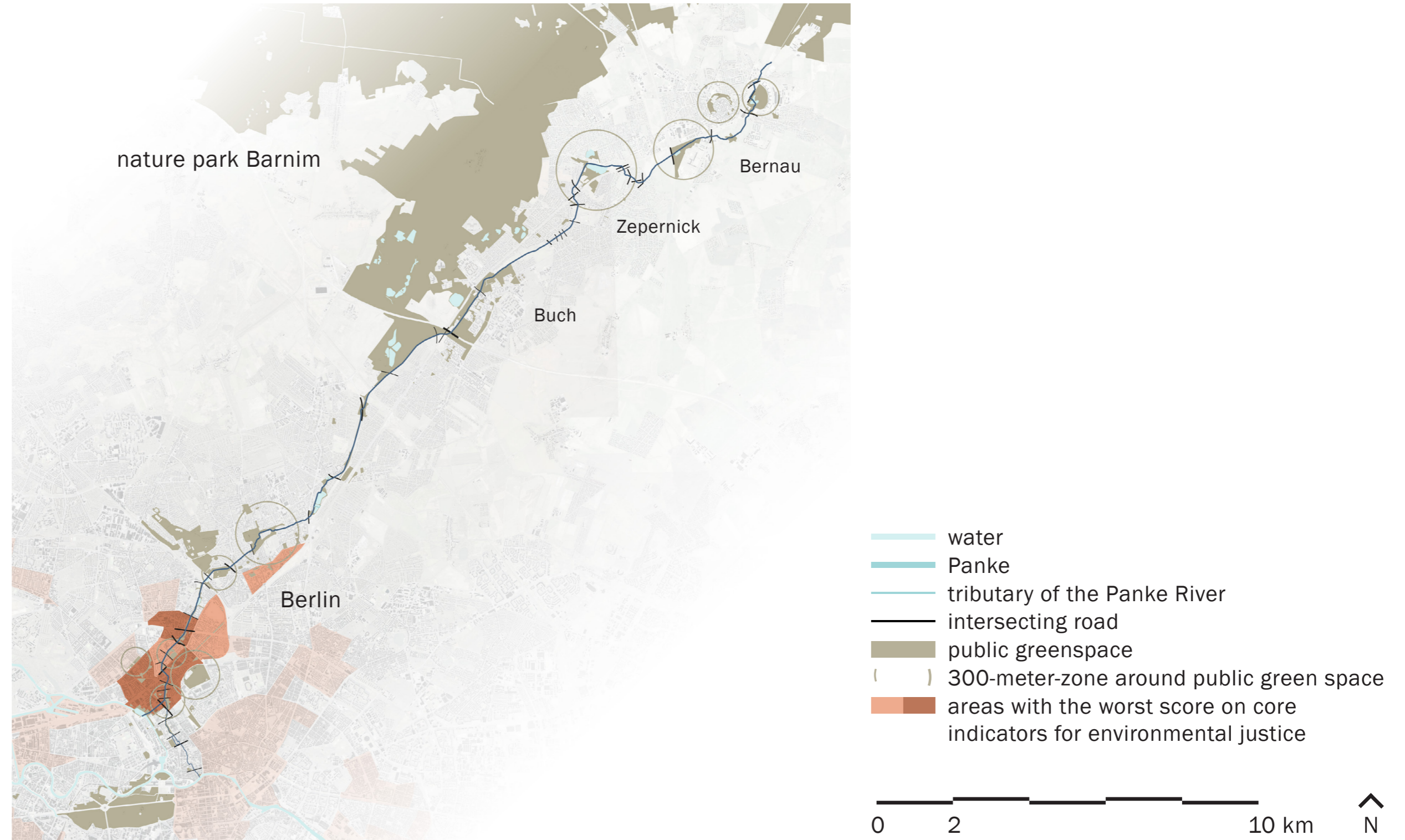
300m from green space

The Panke River: not just a corridor

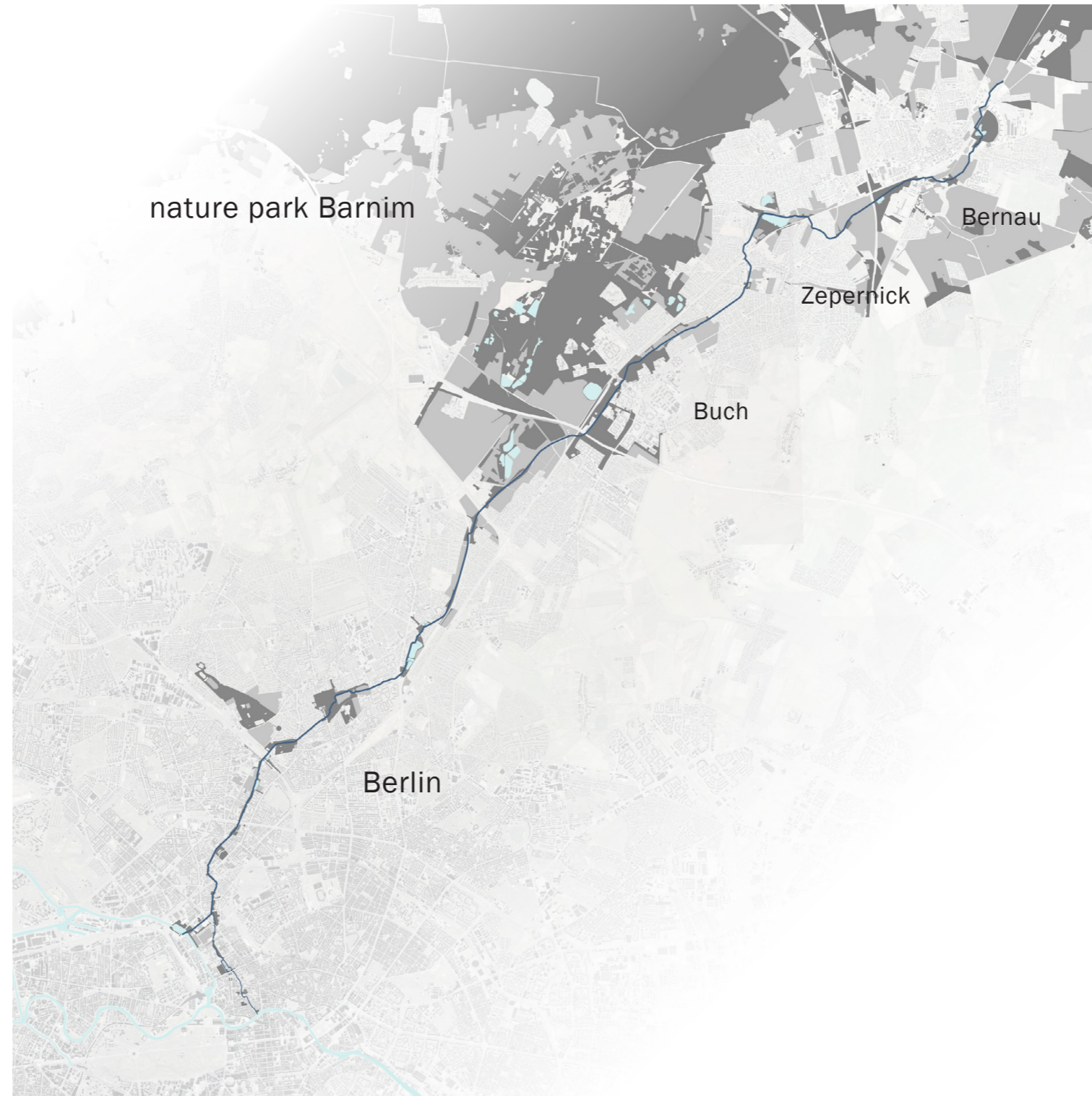
The Panke River as ecological corridor



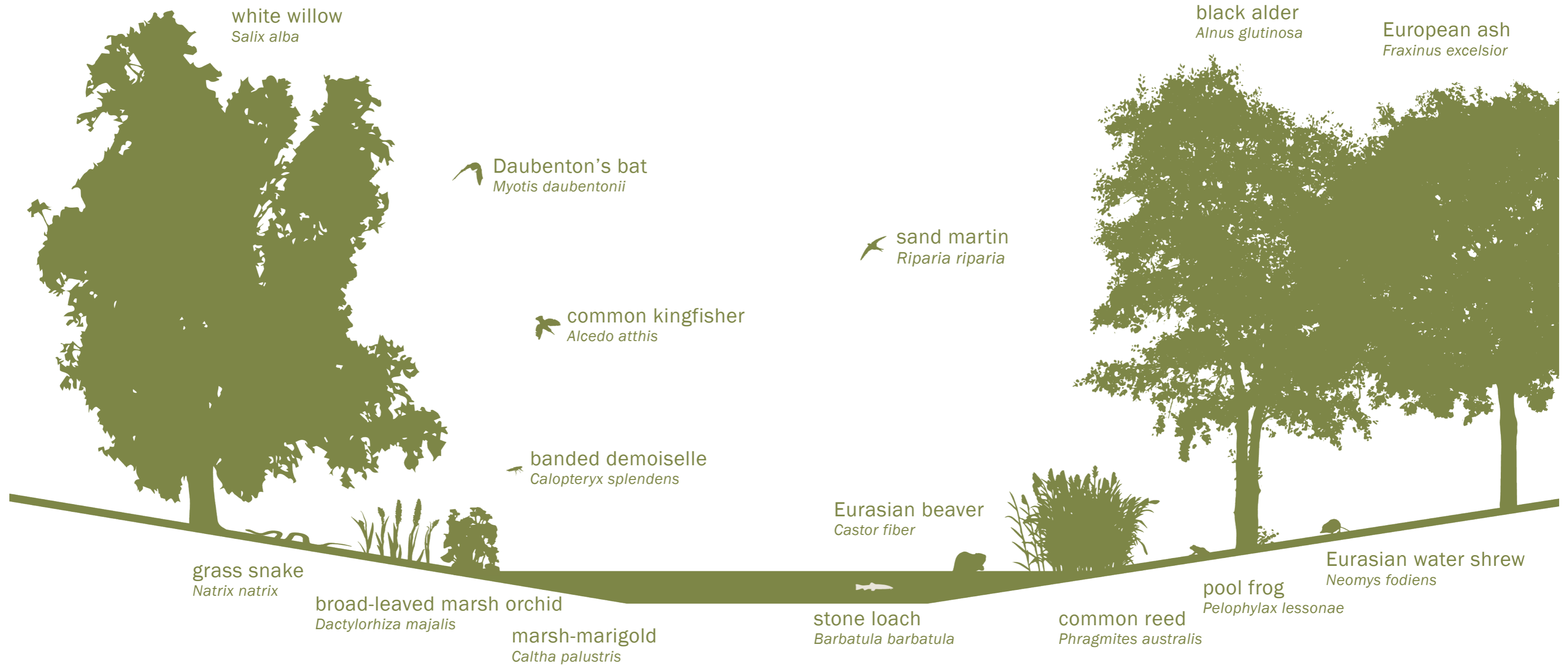
The Panke River and access to green spaces



The open landscape



The natural ecosystem



Target species



Eurasian beaver
Castor fiber



grass snake
Natrix natrix



Daubenton's bat
Myotis daubentonii



common kingfisher
Alcedo atthis



common blackbird
Turdus merula



grey heron
Ardea cinerea



pool frog
Pelophylax lessonae



Eurasian water shrew
Neomys fodiens



stone loach
Barbatula barbatula



banded demoiselle
Calopteryx splendens



greylag goose
Anser anser



European hedgehog
Erinaceus europaeus

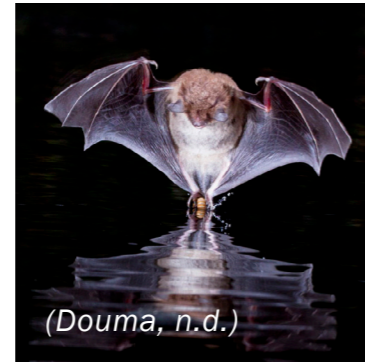


← excessive demands

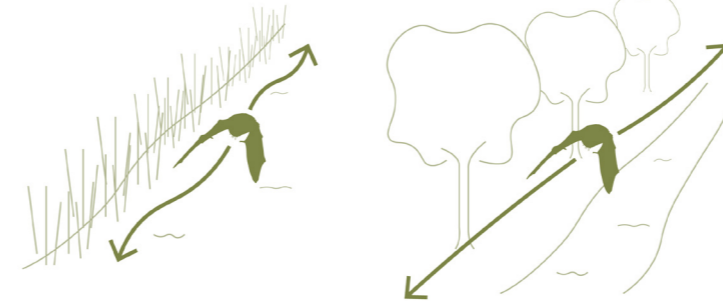
target species

generalists →

Requirements of the target species



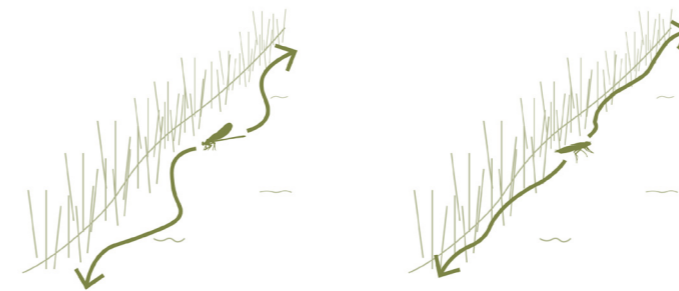
Daubenton's bat
Myotis Daubentonii



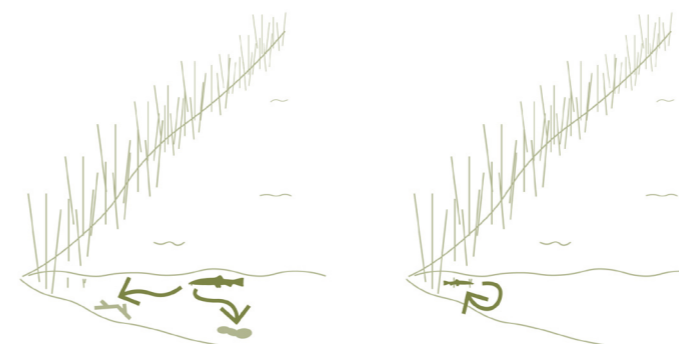
Common kingfisher
Alcedo atthis



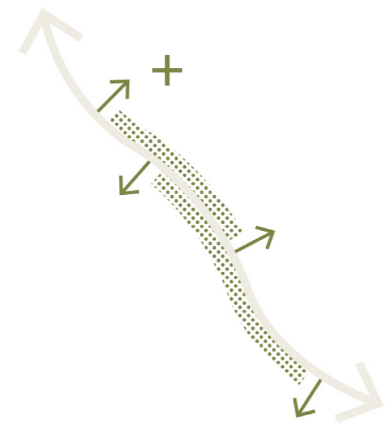
Banded demoiselle
Calopteryx splendens



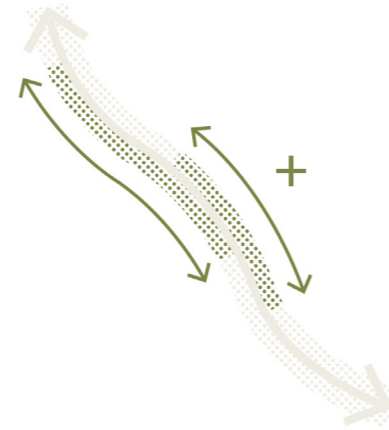
Stone loach
Barbatula barbatula



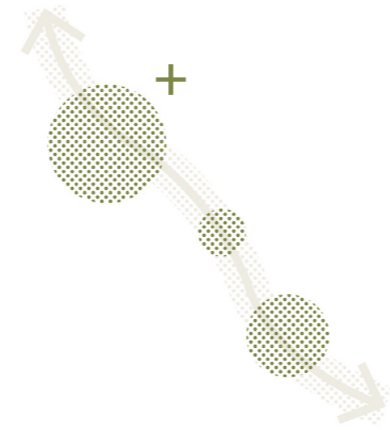
Design principles



nature-friendly river banks



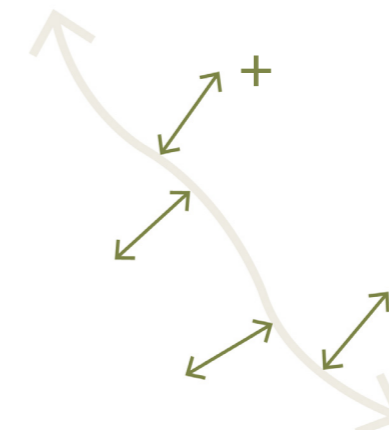
continuity of the riparian zone



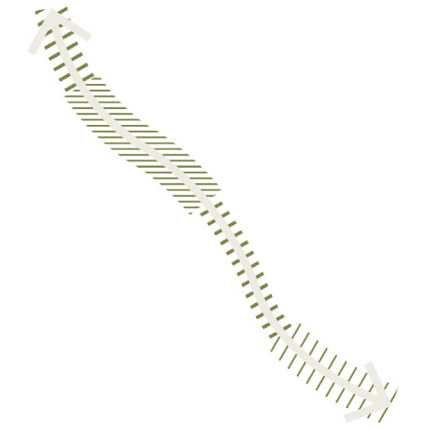
renaturalized patches for the target species



separate greenspaces connected as one park



enhanced connection with the neighborhood

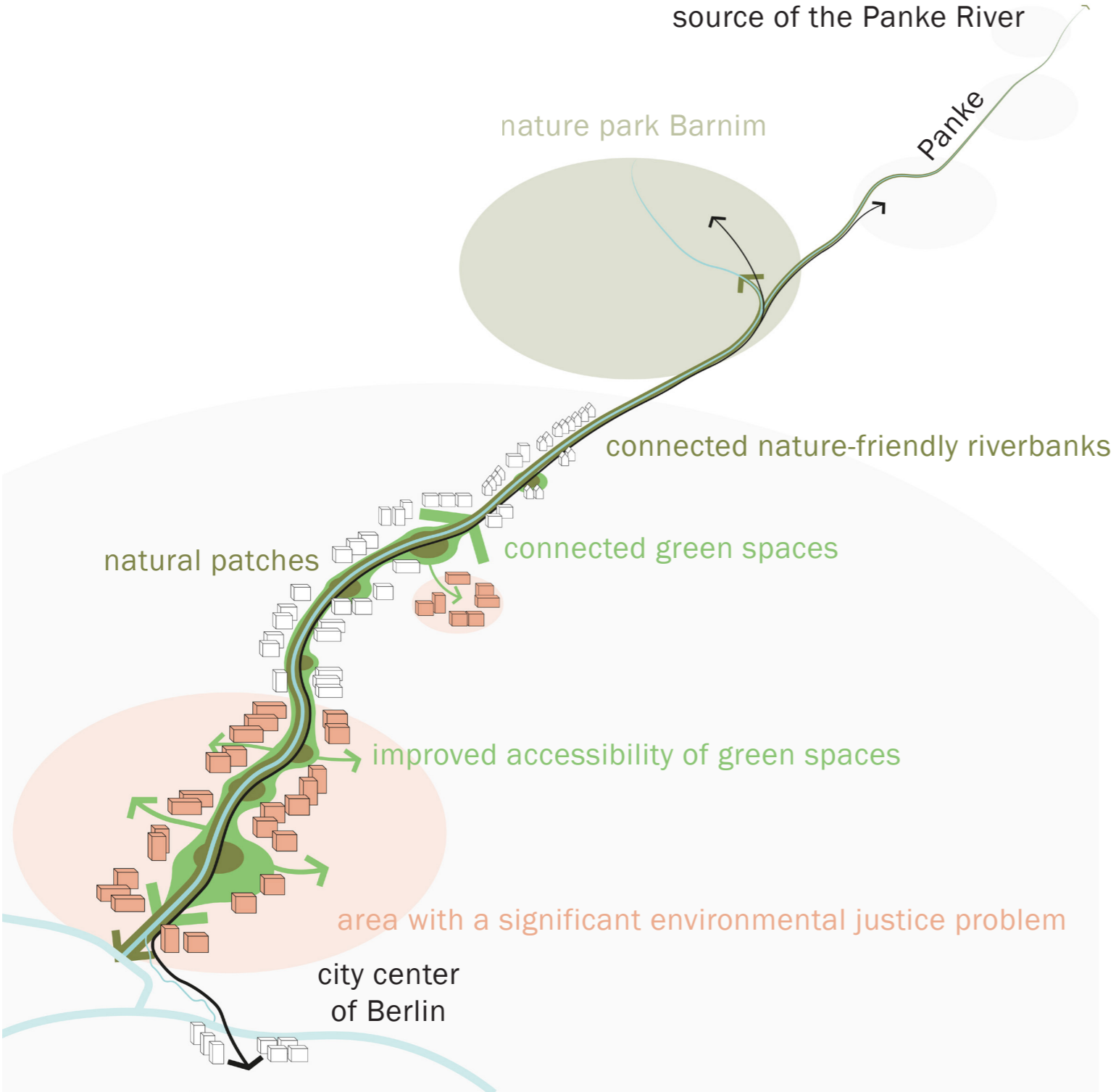


support a diversity of recreational activities

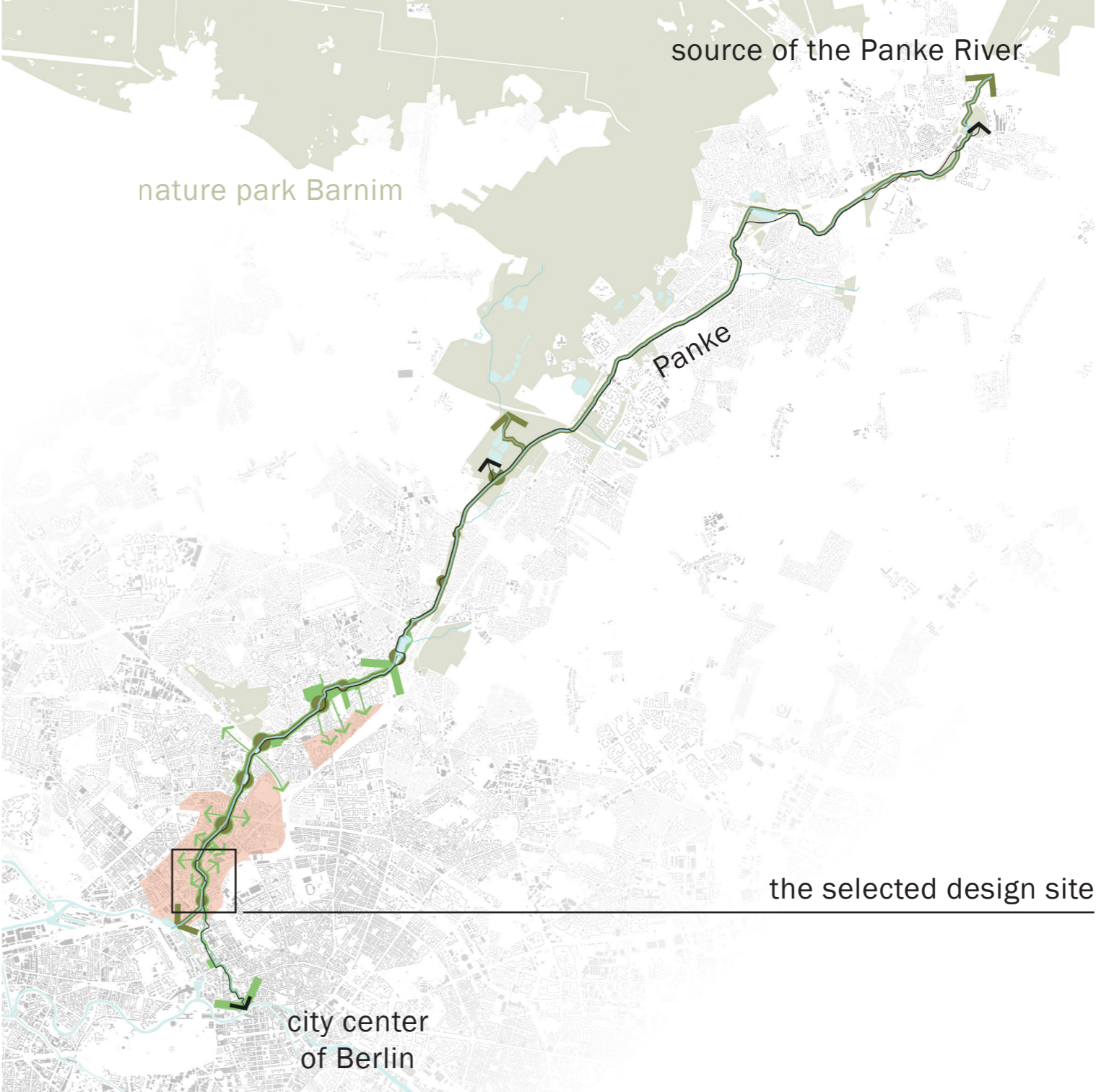
Ecological design principles

Environmental justice design principles

Vision for the Panke River



Schematic vision



Vision

The design of not just a corridor



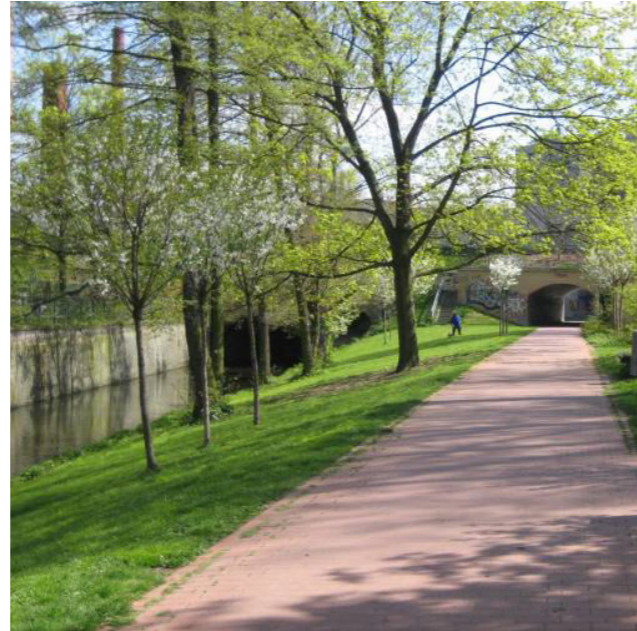
0 100 500 m N

Satellite image of the design site (ESRI, 2023)

Urban habitats



a. bridge



b. Prunus and Acer (Pharus, n.d.)



c. courtyard



d. buildings



River bank typologies



a. high walls



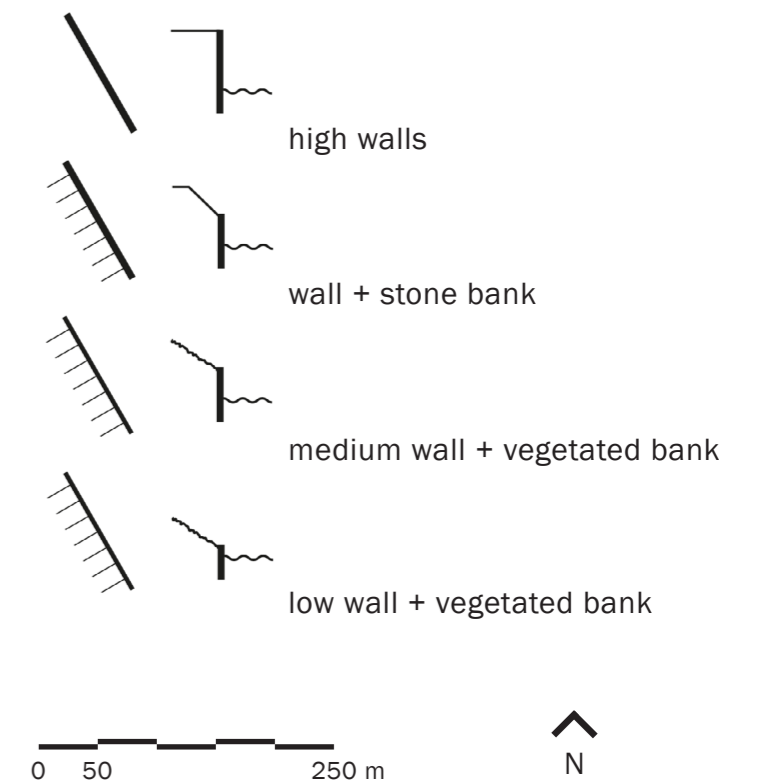
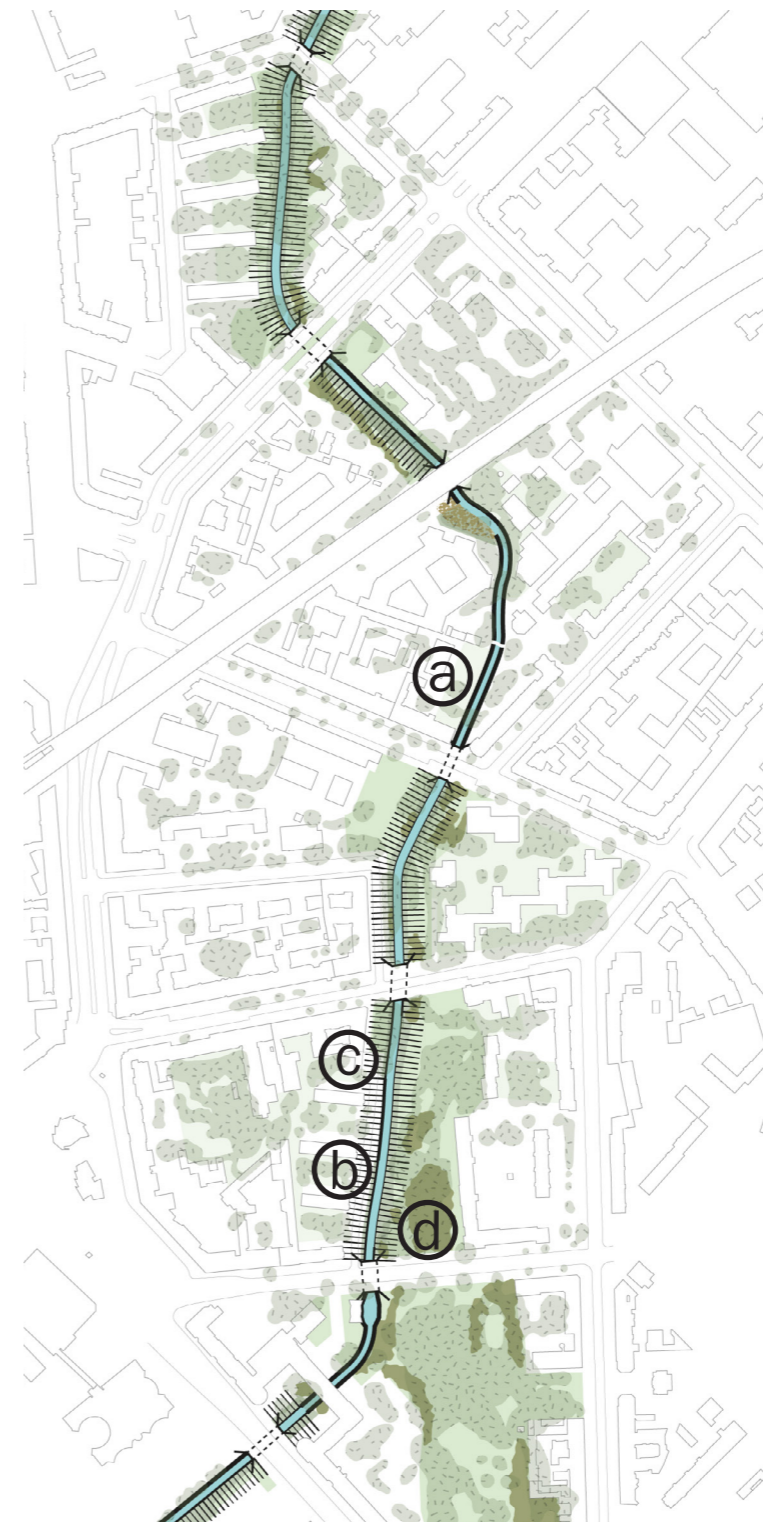
b. wall + stone bank



c. medium wall + vegetated bank



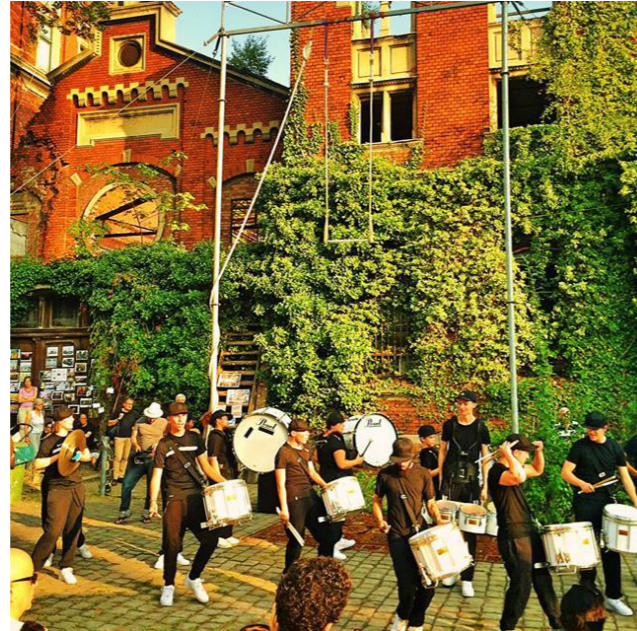
d. low wall + vegetated bank



Relevant land use



a. playground (Woll, 2018)



b. event (Wiesenburg, 2016)



c. pop-up bar (Laucius, 2021)



d. park (F. A.-St., 2019)



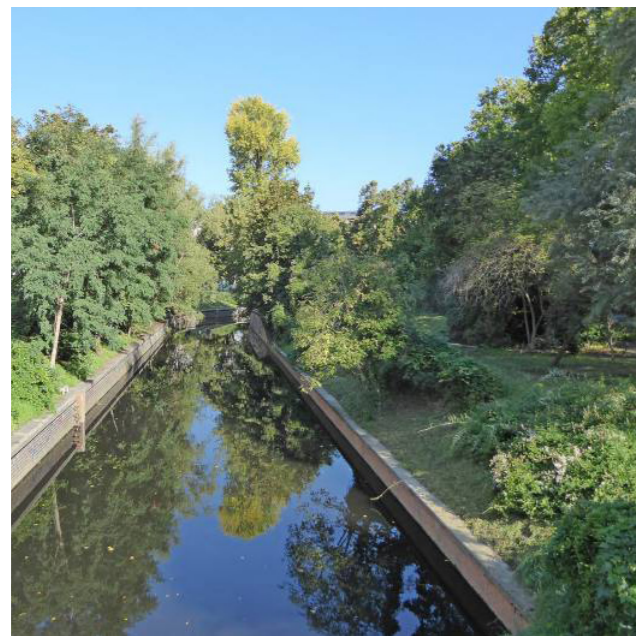
Green space quality



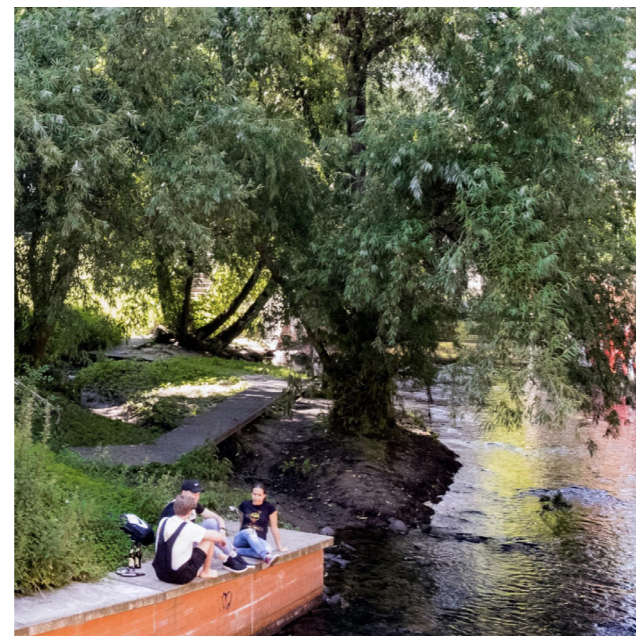
a. intersecting road



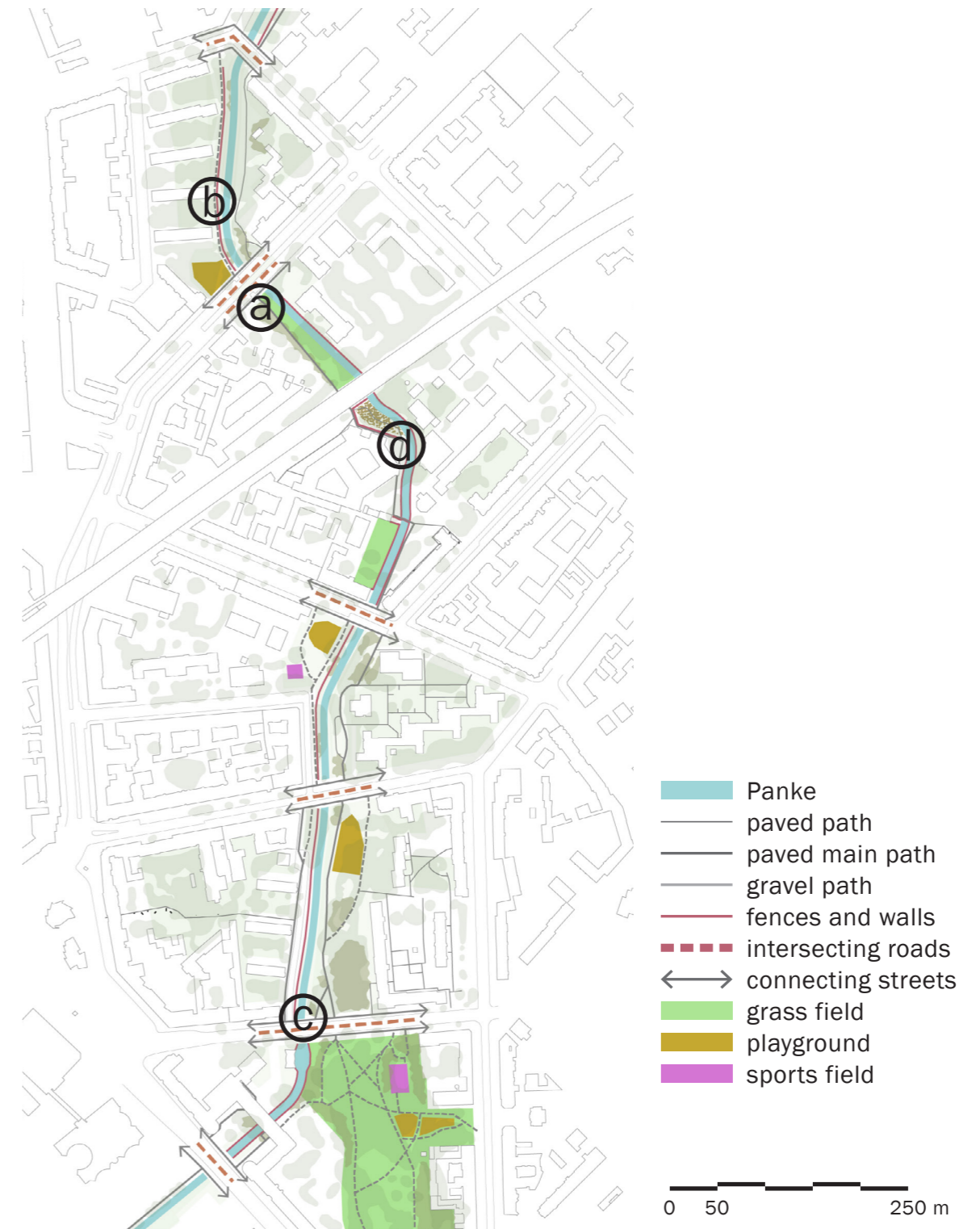
b. gravel path and wall



c. shrubs (Pharus, 2010)



d. recreation



Design vision

- dynamic nature**
- habitat for the target species
- humans at a distance

- recreation in nature**
- recreation in nature

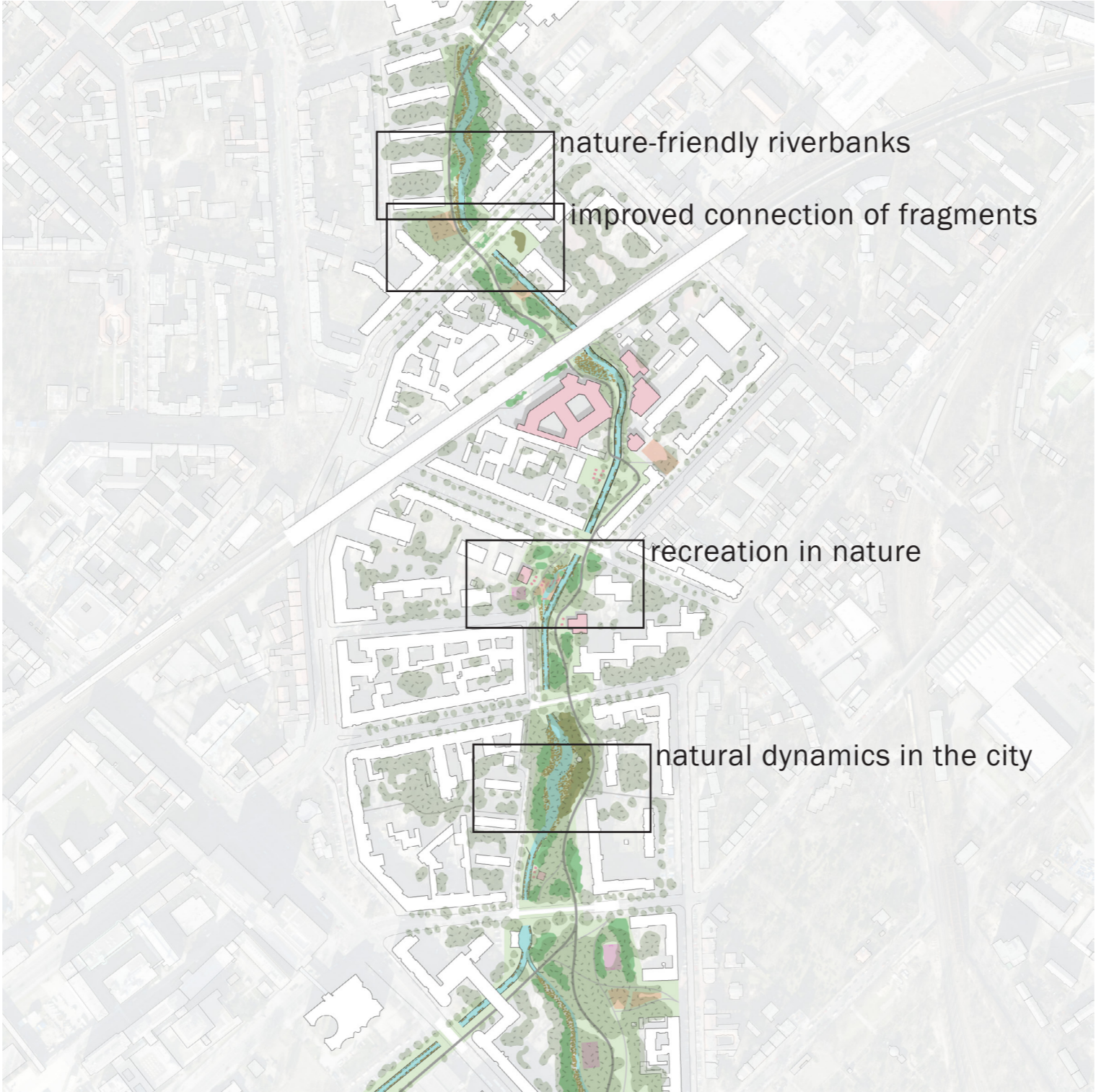
- urban recreation**
- cultural events
- vibrant city park



Design vision



Masterplan

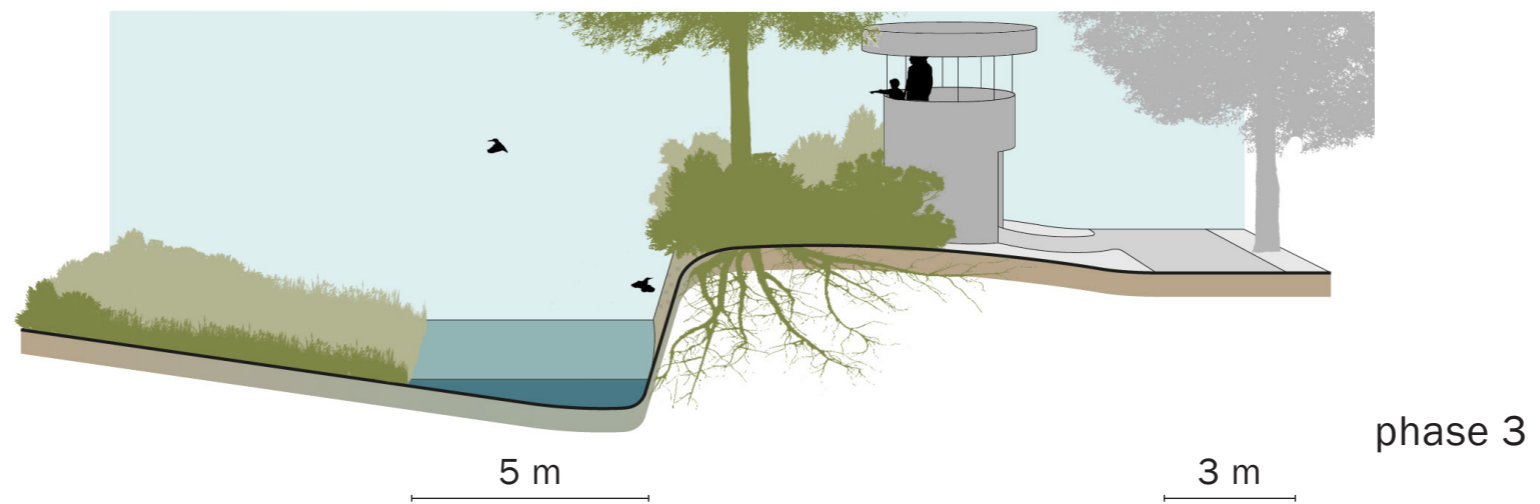
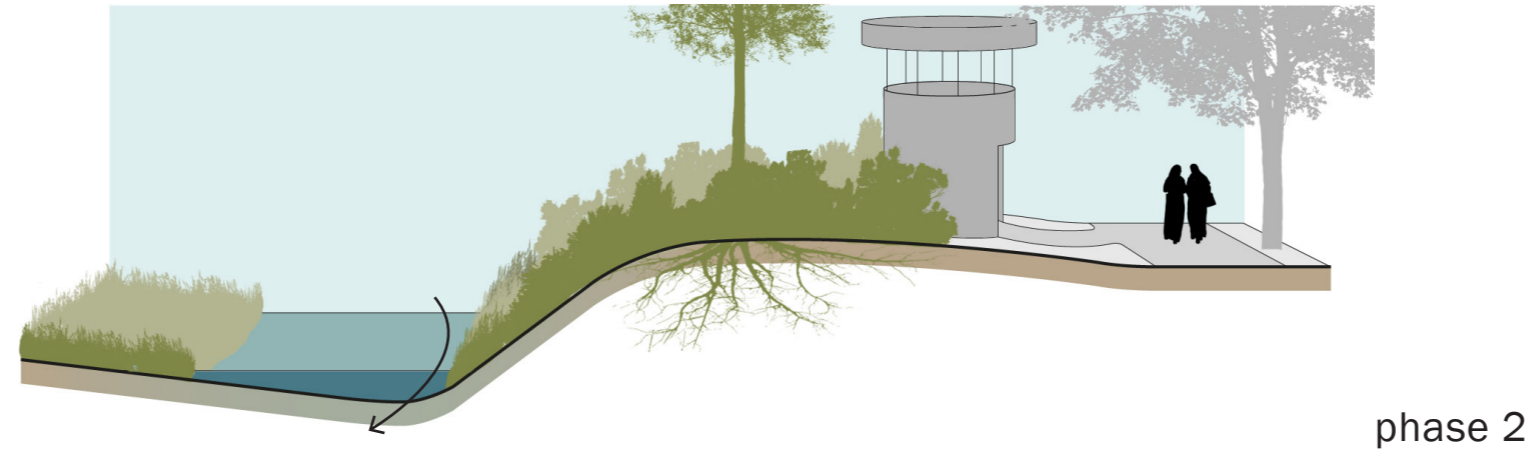
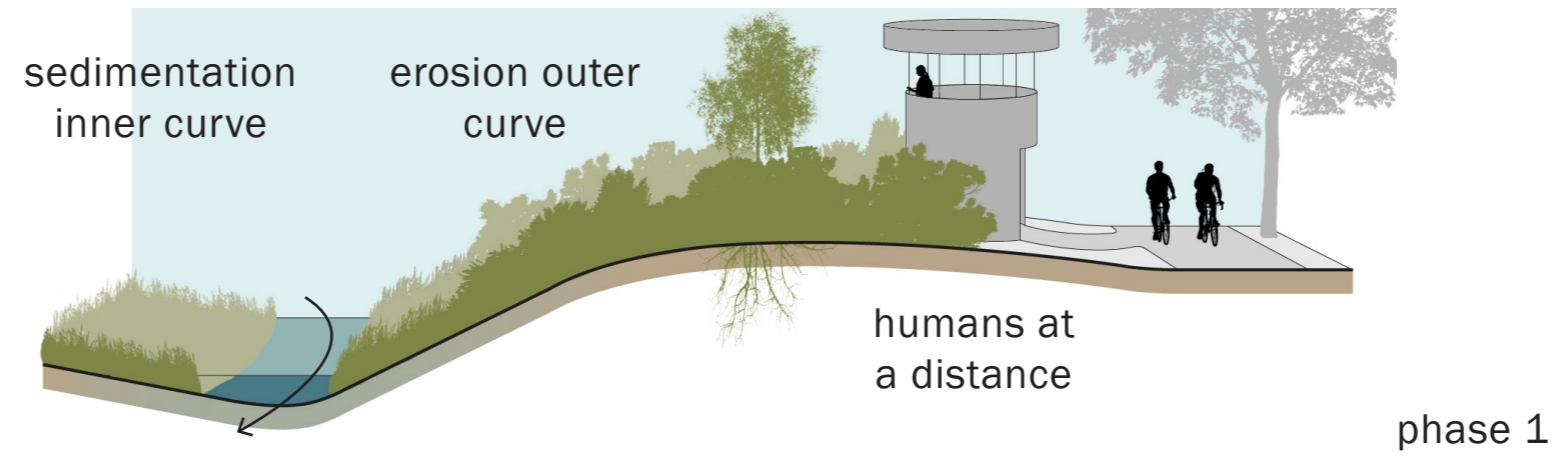


Natural dynamics in the city



(Google, 2008)

Natural dynamics in the city





(Google, 2008)

Nature-friendly riverbanks

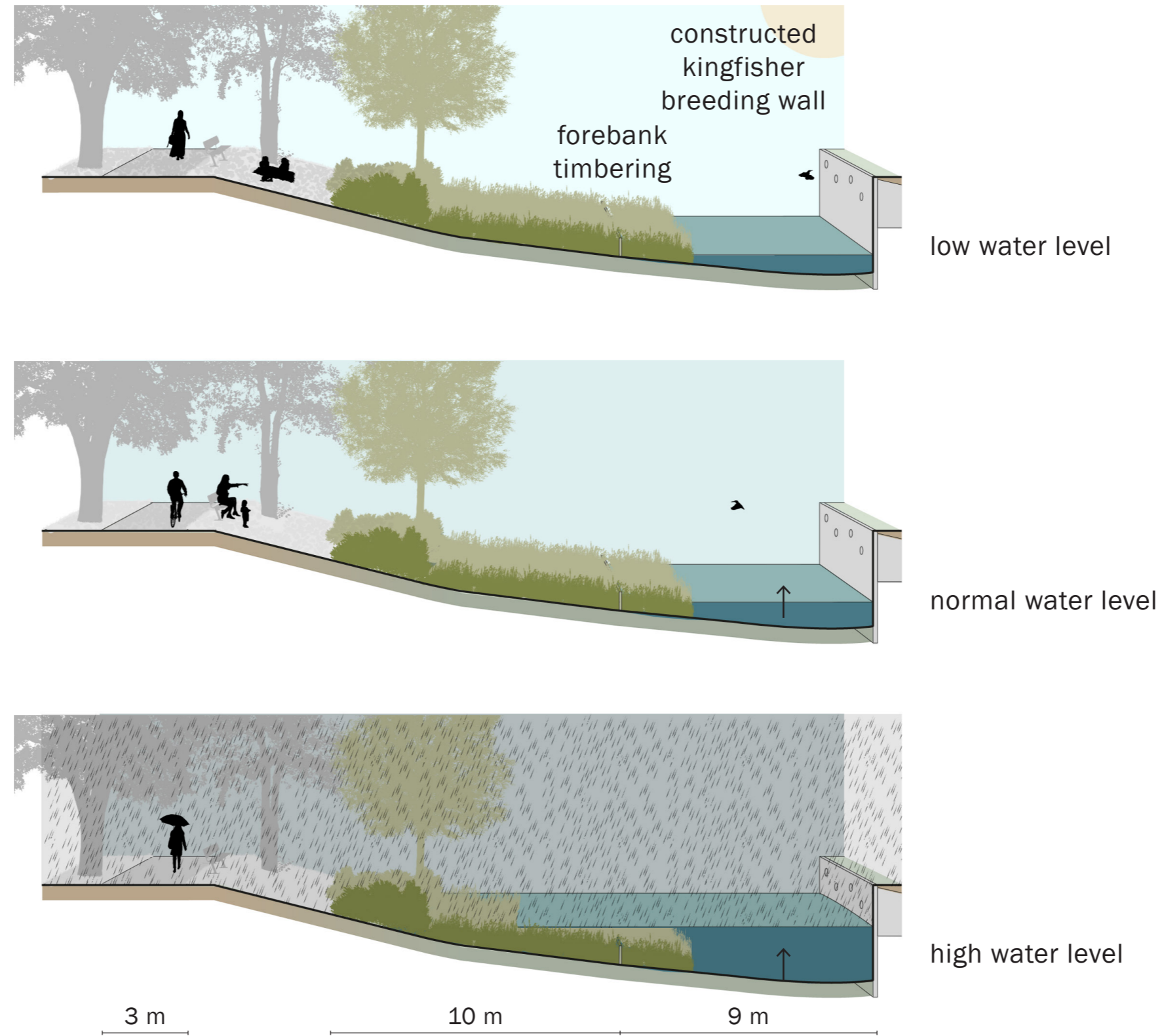


Reference watchtower: Herdla Birdwatching Tower (Johnsson, n.d.)

Nature-friendly riverbanks



Nature-friendly riverbanks







Recreation in nature



Recreation in nature

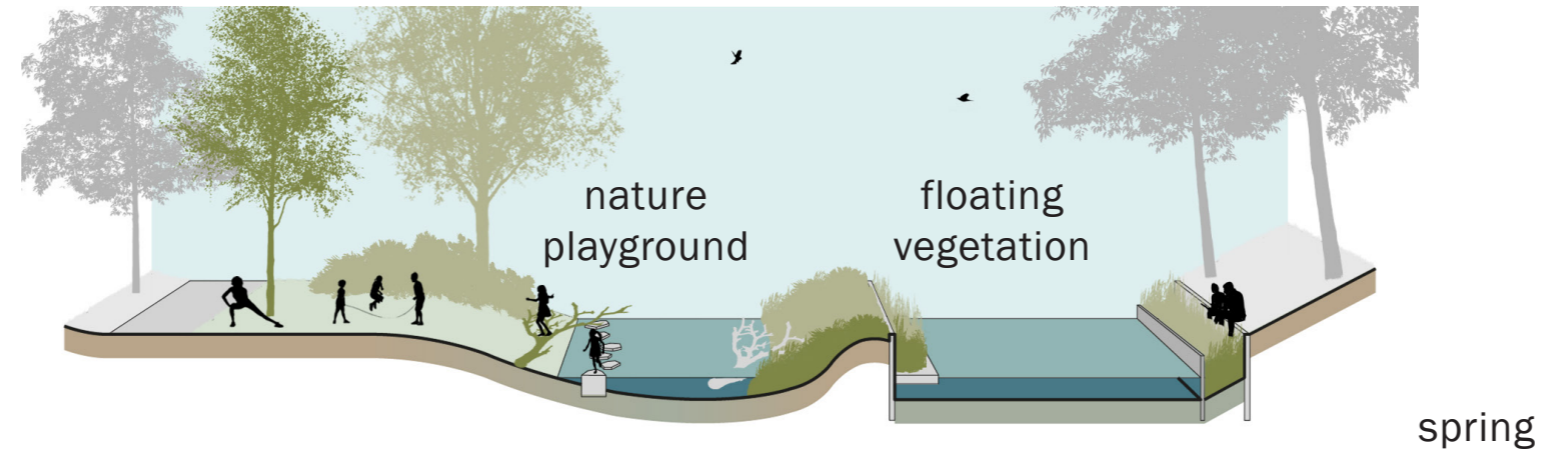
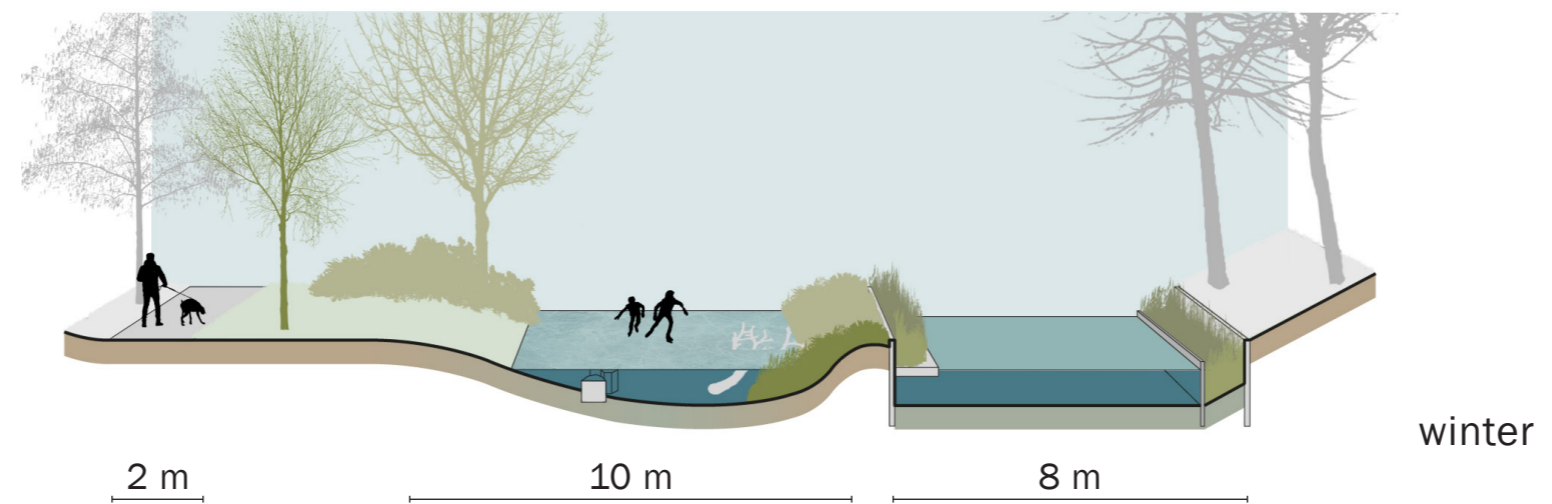
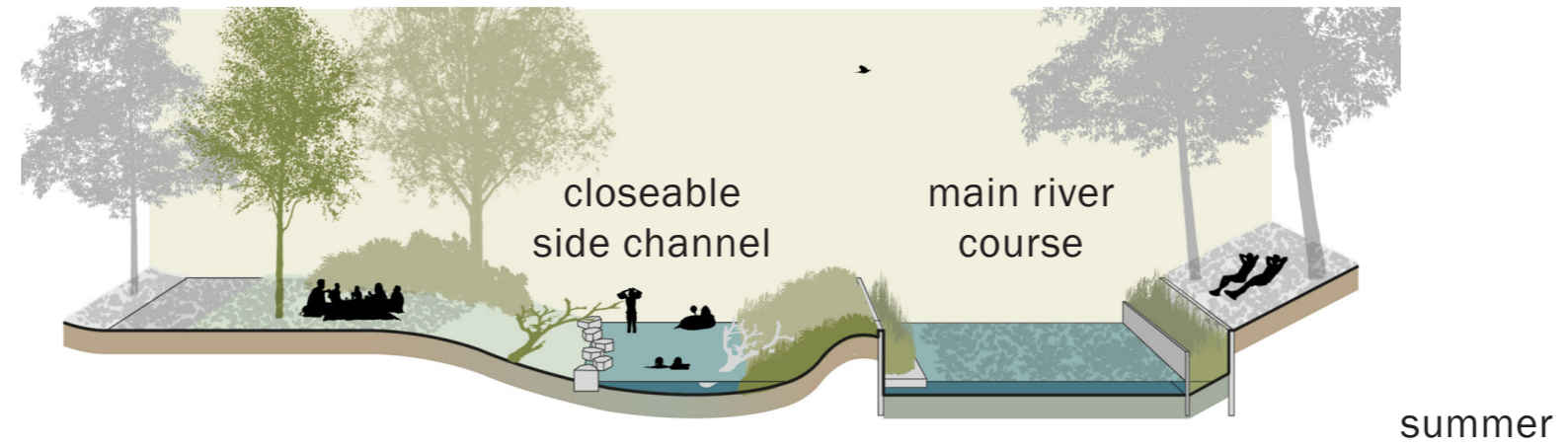


Figure 4.23a. The closeable side channel is playground and a leisure area





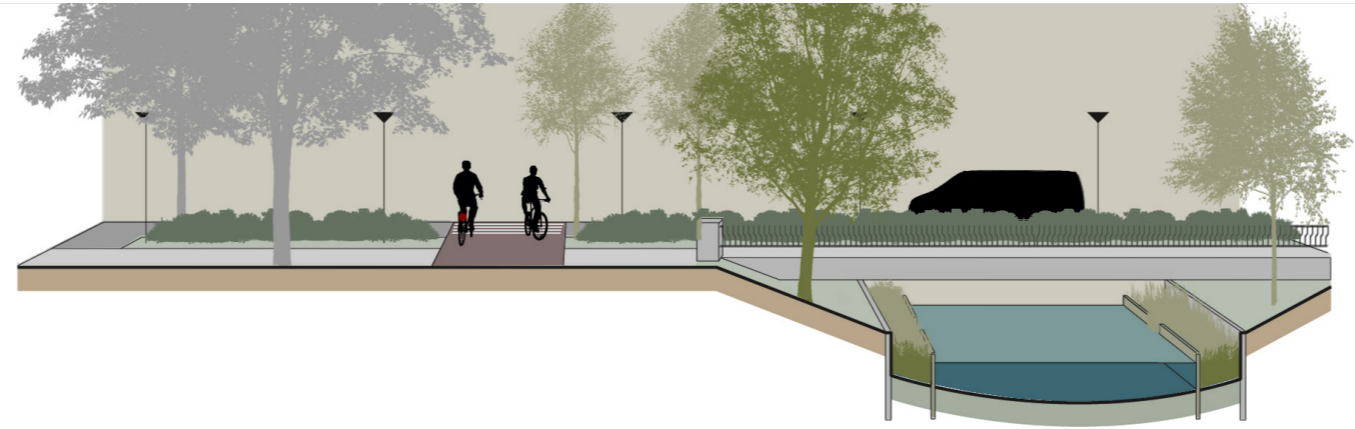
STUDIO MARK



Connection of fragments



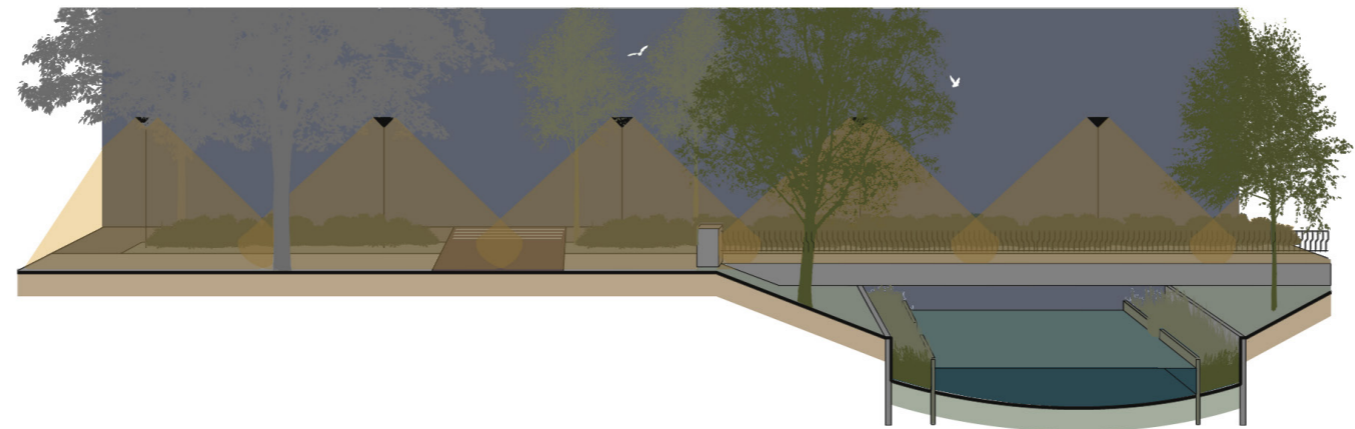
Connection of fragments



morning



afternoon

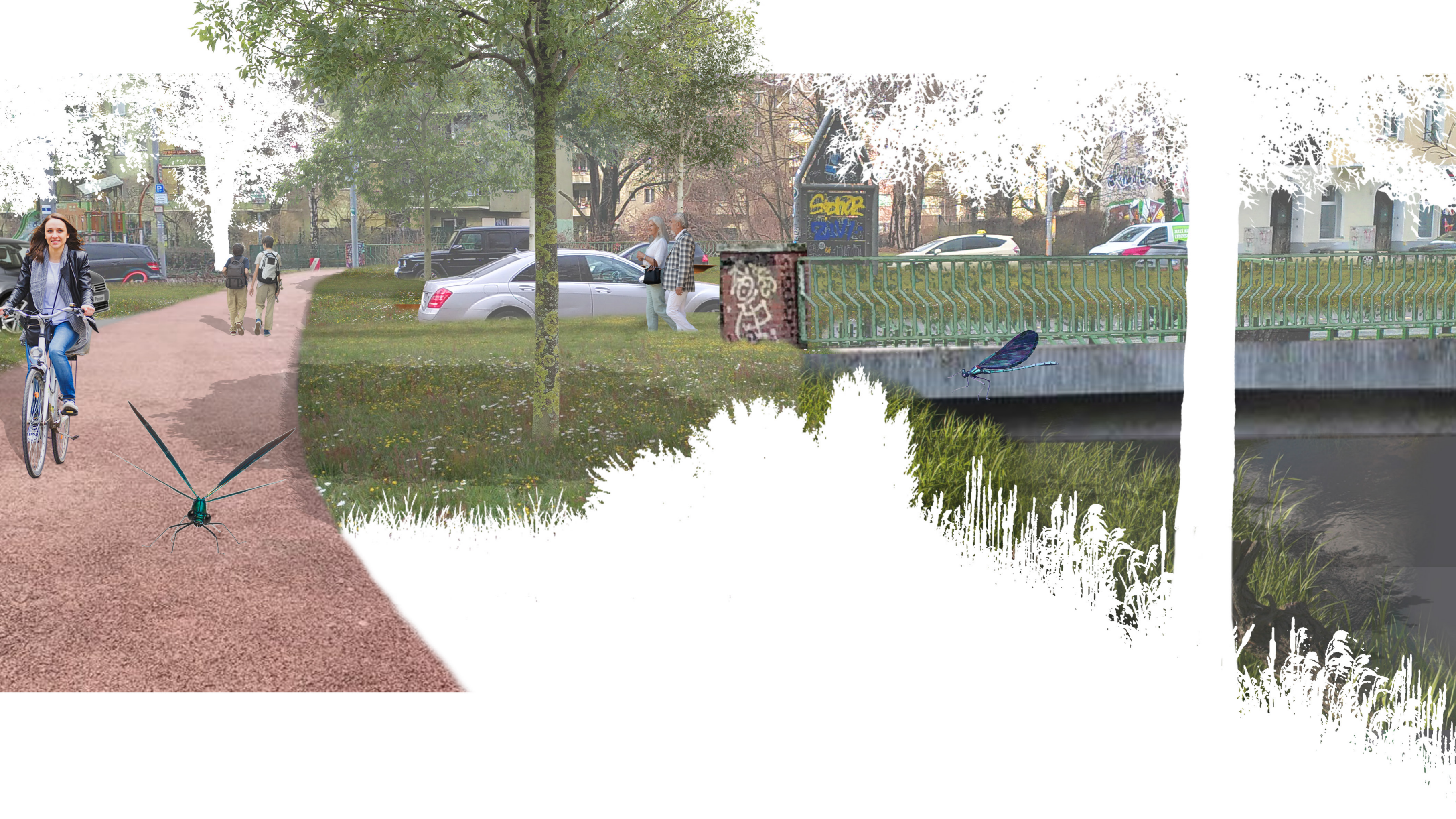


night

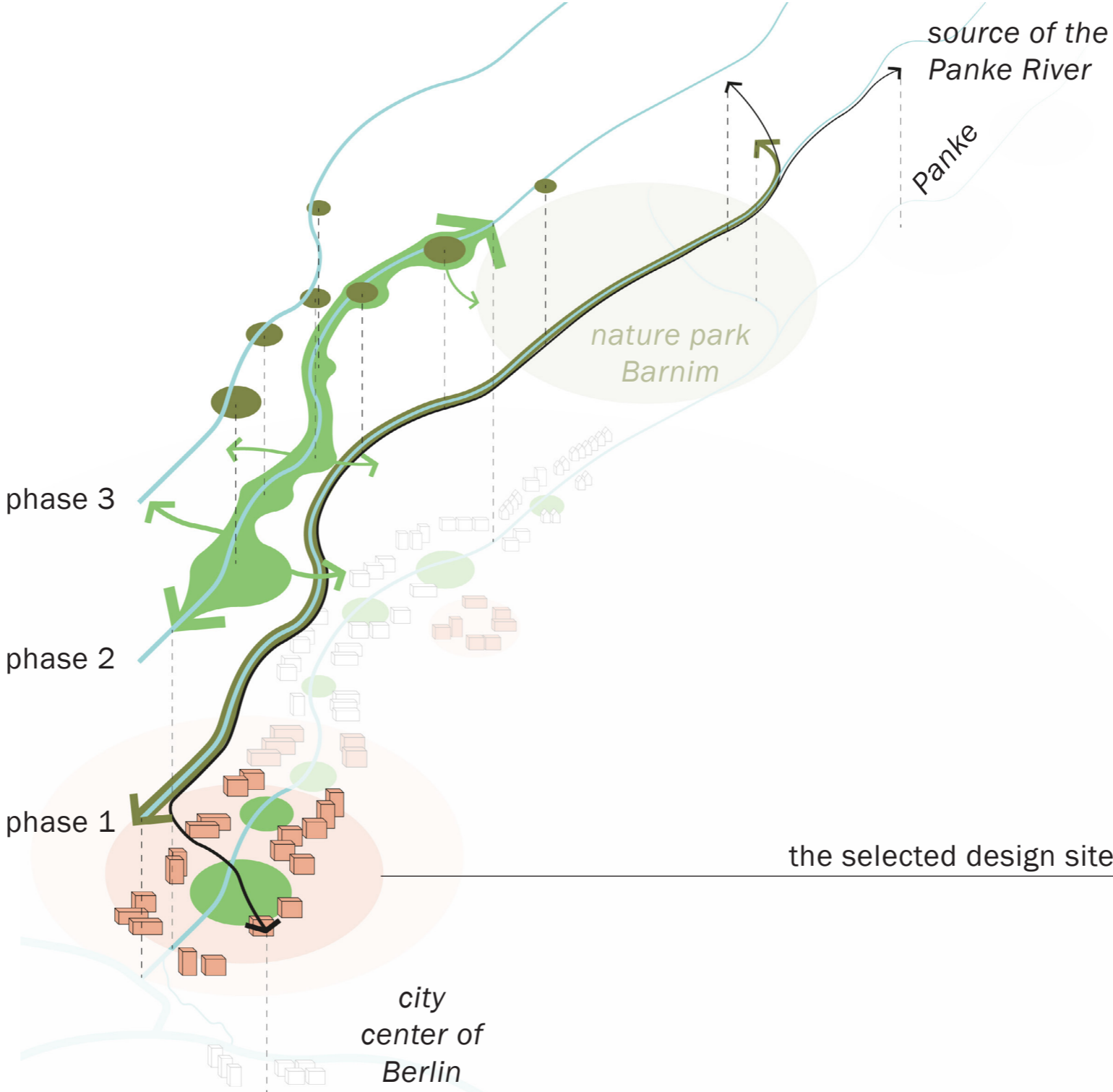
3 m

8 m





Regional phasing strategy



Motivation for Berlin's government

European Water Framework Directive

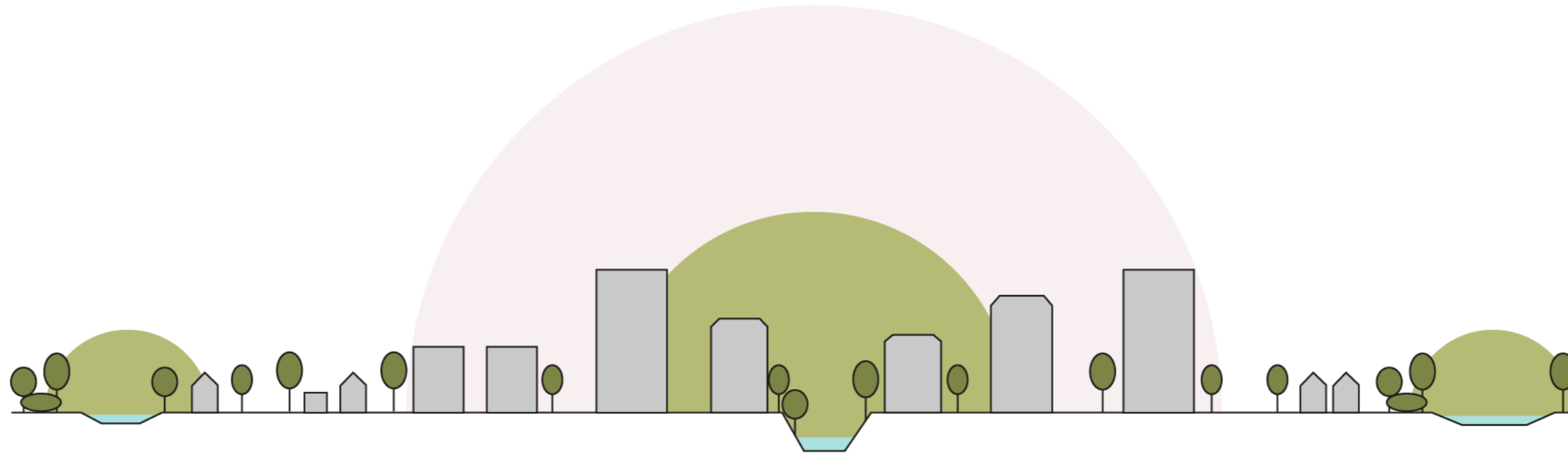
+

liveability ambition

&

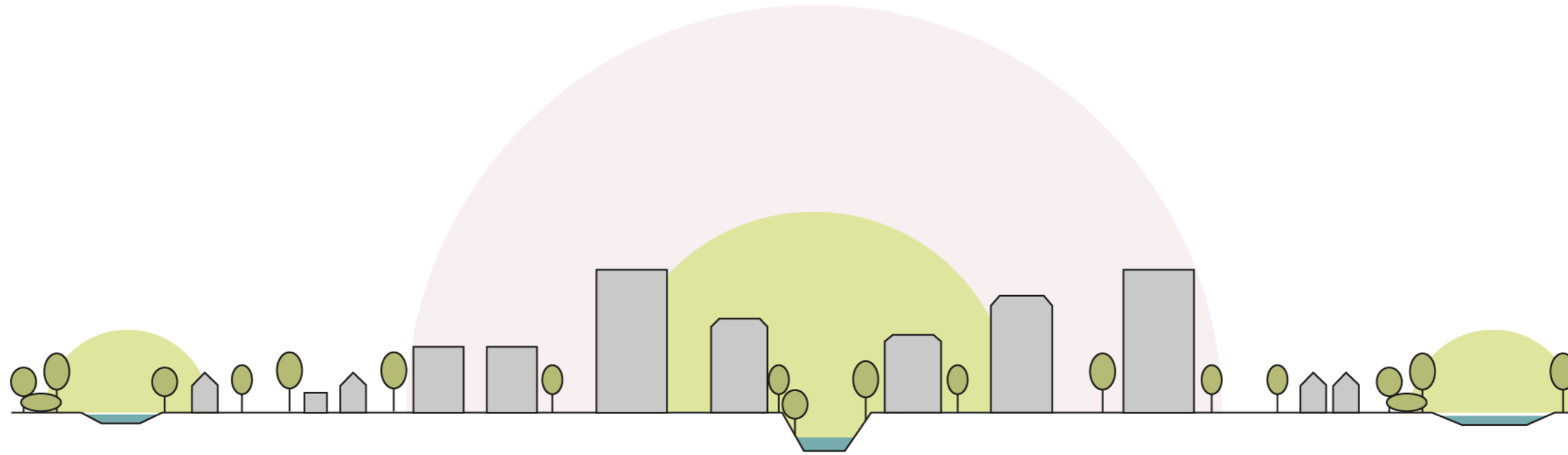
flexible design

Research question



How can ecological landscape design of the Panke River in Berlin provide optimized spatial conditions for both the natural ecosystem and environmental justice?

Conclusion



Ecological landscape design can provide optimized conditions for both the natural ecosystem and environmental justice of the River Panke in Berlin by creating a connected green space along the river and that takes the needs of both humans and target species into account.

Reflection

ecological improvements: the context

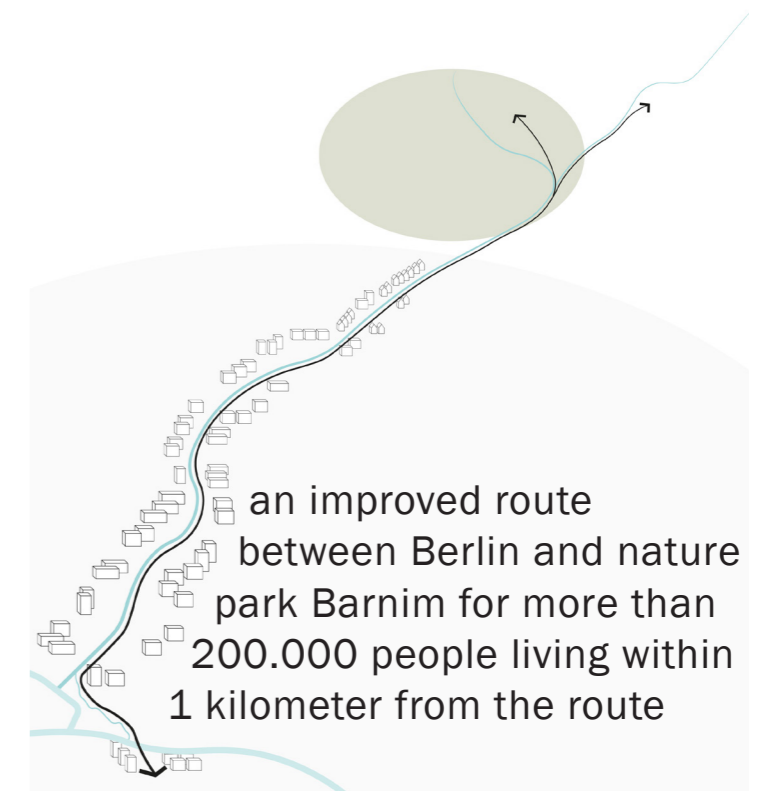
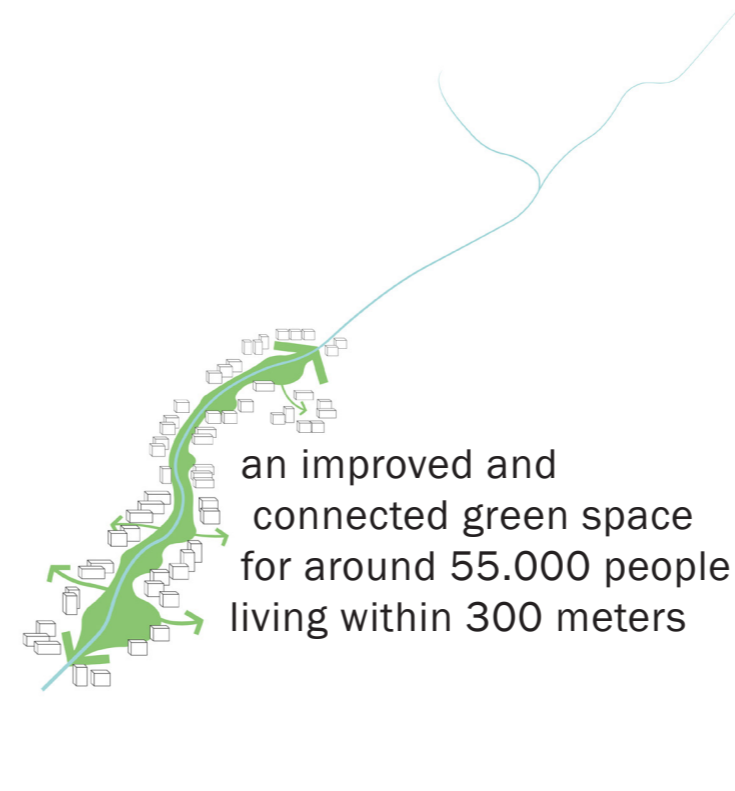
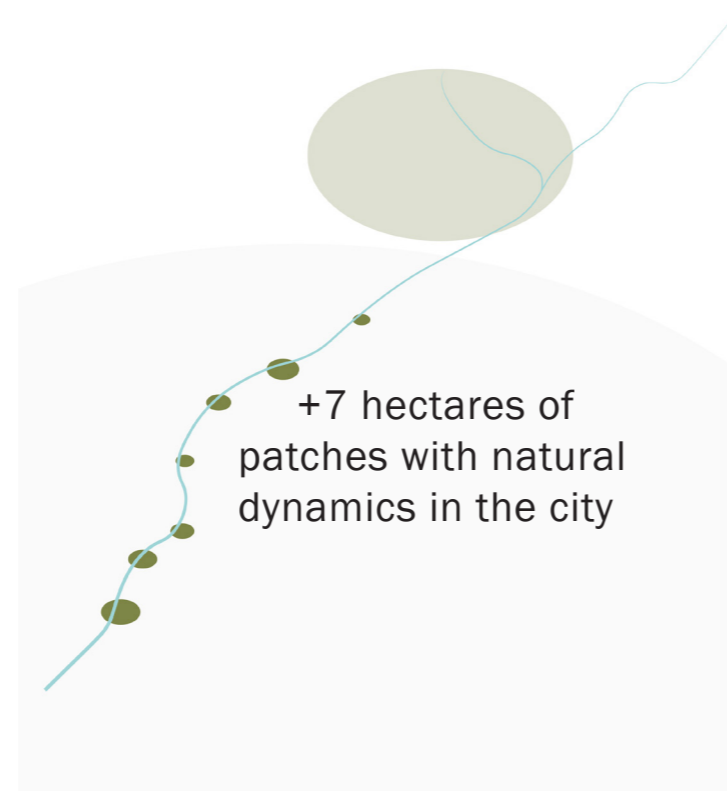
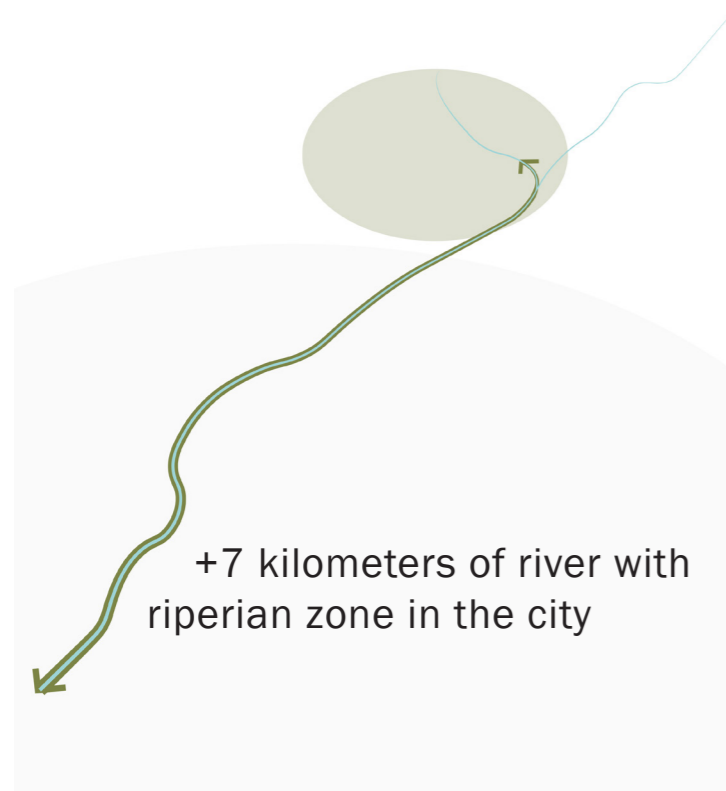
environmental justice: a start


humans or nature?

involvement of people and ecologists

cities around the world

Impact of the design



A detailed street map of a city, likely New York City, with a prominent green corridor highlighted. The corridor starts in the lower-left quadrant and winds through the city towards the upper-right. The map shows a dense network of streets, with the highlighted corridor following a path that appears to be a major thoroughfare or transit route. The text 'NOT JUST A CORRIDOR' is overlaid on the left side of the map.

NOT JUST A CORRIDOR

See next page for references

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Slide 3

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