

IN BETWEEN NATURE

Nature based placemaking for Rotterdam's territories in-between

Graduation Thesis Presentation
July 2nd, 2021
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4720741

URBAN



Retrieved from: <https://www.cbs.nl/en-gb/news/2016/14/small-and-relatively-expensive-housing-in-amsterdam>

RURAL



ANP, retrieved from: <https://www.trouw.nl/duurzaamheid-natuur/biologisch-boeren-groeit-in-nederland-veel-te-langzaam-maar-de-boeren-willen-wel-b772a4f4/>



DEFINITION

Territories in-between (TiB):

Territories which cannot merely be described as urban or rural, but are somewhere in-between.

- Wandl, 2020

Important characteristics of the TiB:

1. Intermingling of built and unbuilt spaces
2. Strong functional mix
3. Significant presence of infrastructures

MAPPING THE TERRITORIES IN-BETWEEN

Shadow map TiB

- 1. Major infrastructure corridors and intersections.
- 2. Urban edges
- 3. Functional landuses
- 4. (Un)protected areas

Degree to which locations
contains features of TiB.

Low

High



TERRITORIES UNDER PRESSURE

Help, waar blijven de sportvelden na bouw golf? CDA maakt zich zorgen

Het CDA maakt zich zorgen over de enorme bouw golf die Rotterdam wacht. De partij is enthousiast over de plannen om tussen nu en 2040 50.000 woningen te bouwen. Maar die nieuwbouw komt binnen de ring, in open en groene gebieden. Juist op de plek waar nu sportterreinen liggen.

Adrianne de Koning 18-07-19, 23:20



Rotterdam gaat de komende twintig jaar volop huizen bouwen in nog open en groene gebieden binnen de ring. Aan de oostzijde, langs de A16 tot aan Feyenoord City, staan alleen al 22.000 woningen gepland. Dit gaat vooral ten koste van sportvelden, volkstuinen en bedrijventerreinen.

Monica Beek en Antti Liukku 18-07-19, 07:00 Laatste update: 18-07-19, 07:59

Petitie tegen de sloop van volkstuinen in Delfshaven

di 5 jan 2021, 13:08



Rotterdam - Tuinders van volkstuinvereniging Streven naar Verbetering (SNV) zijn geschokt door plannen van het gemeentebestuur om een groot deel van het complex in Delfshaven te slopen. Een derde van het tuinenterrein zou moeten worden opgeofferd om plaats te maken voor een kunstgras voetbalveld. Er is een petitie gestart om sloop te voorkomen.

Vraag naar volkstuin explodeert sinds coronacrisis: 'Overschie klinkt ineens als Zuid-Frankrijk'

Er is in heel Rotterdam vrijwel geen volkstuin meer te krijgen. Sinds het uitbreken van de coronacrisis is de vraag naar zo'n stukje groen in de stad geëxplodeerd. Bij veel verenigingen kom je zelfs niet eens meer op de wachtlijst: „Neem geen contact met ons op, dit heeft geen zin.”

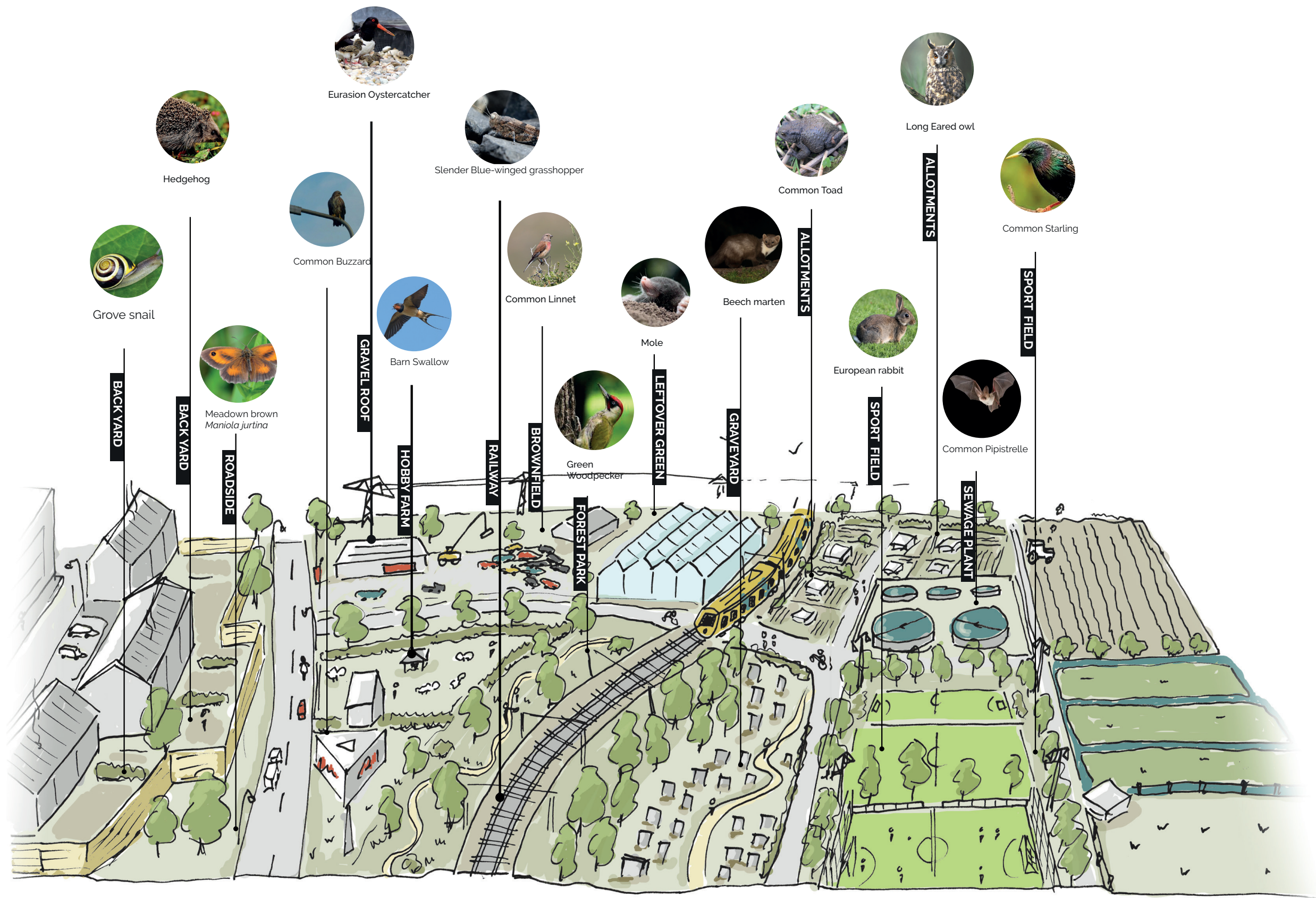
Volkstuinders protesteren tegen afpakken van hun 'park', maar ook voetbal en stadscamping zitten klem

Dat wordt nu de truc in Rotterdam: bouwen zonder dat het ten koste gaat van de fijne stekkie in de stad

COMMENTAAR Het is dringen om ruimte in Rotterdam, waardoor Steeds Hooger moet vrezen voor z'n voortbestaan. Het verhaal van de voetbalclub is een voorbode van wat de stad te wachten staat.



HABITATS OF THE TERRITORY IN-BETWEEN



MAIN RESEARCH QUESTION

*“How can a nature based planning and design approach strengthen **biodiversity** and **sense of place** in Rotterdam's territories in-between ?”*

RESEARCH ORIENTED SUB-QUESTIONS

How are Rotterdam's TiB addressed in local and regional **spatial planning processes**?

What are the **spatial characteristics** of Rotterdam's TiB?

What are the **ecological opportunities and challenges** of Rotterdam's TiB?

What are the **challenges and opportunities** with respect to **sense of place** in Rotterdam's TiB?

Methods:

Literature review

Spatial analysis

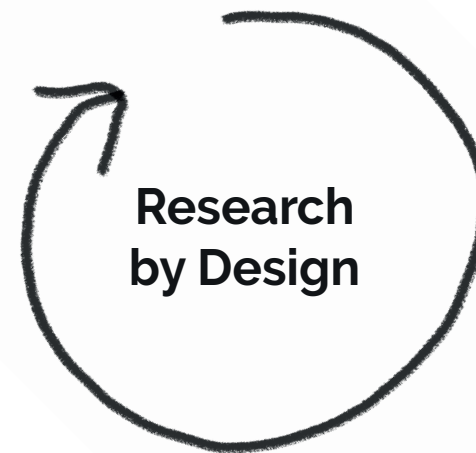
Site visits

DESIGN ORIENTED SUB-QUESTIONS

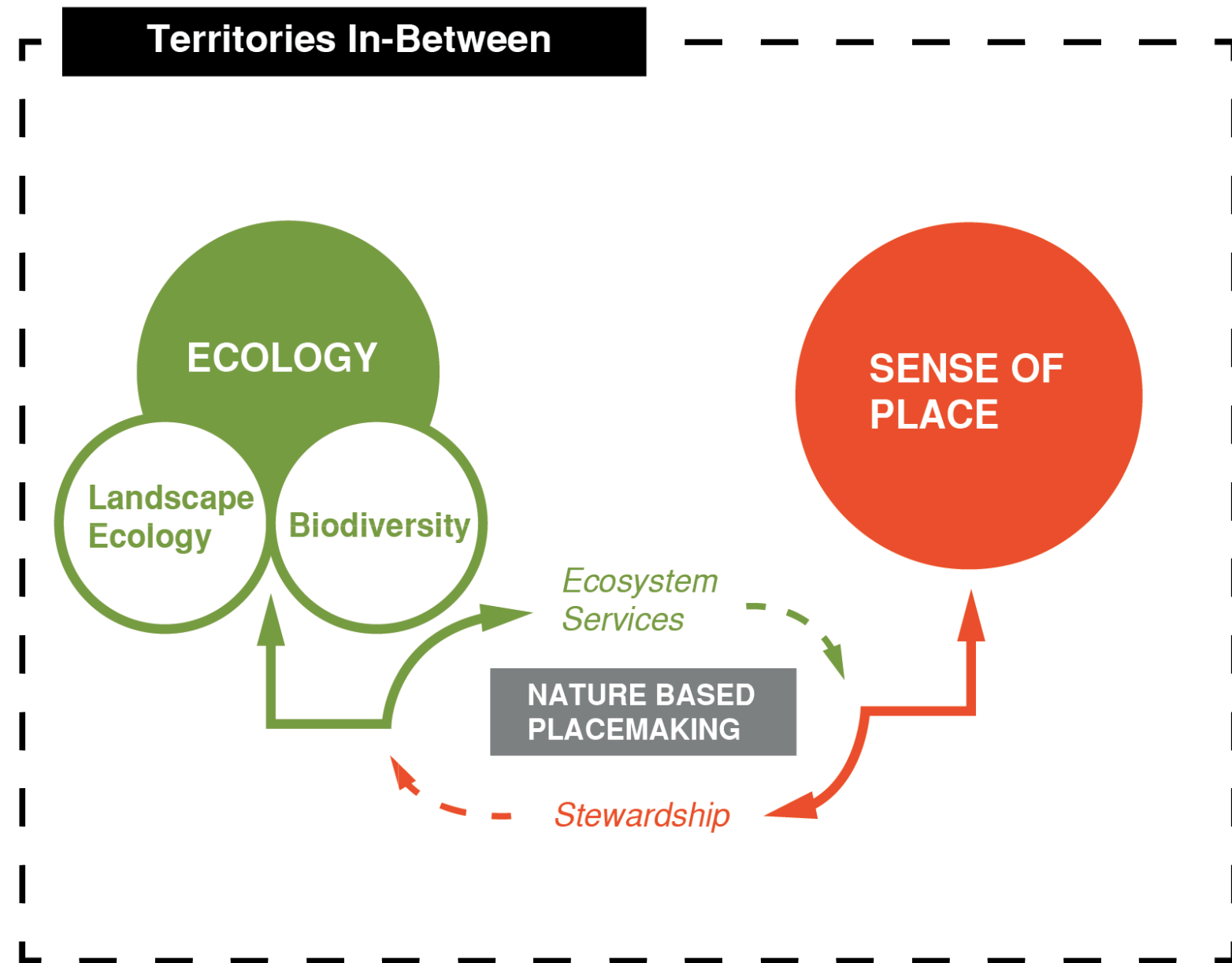
What kind of **ecological interventions** strengthen **sense of place** in Rotterdam's TiB?

What kind of **vision and spatial planning strategy** ensures biodiversity and the provisioning of ecosystem services in the TiB at local and regional scale?

How can ecological design interventions that strengthen biodiversity and sense of place in the TiB be spatially **integrated in a design transformation** for a particular case in Rotterdam?



THEORETICAL FRAMEWORK



Made by author

RELATIONSHIP BETWEEN SENSE OF PLACE AND NATURE

*" **Sense of place** emerges through our **interactions** with the **biophysical environment**"*

(Masterson et al., 2017).

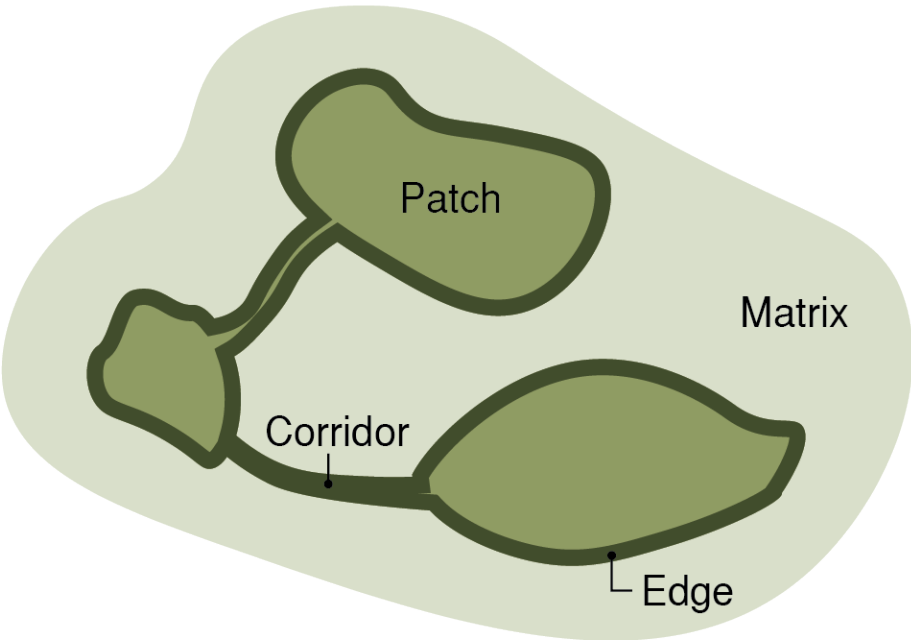
*"Furthermore, in developing **connections with** place and **nature** [...] **stewardship** for the place may be developed and strengthened."*

(Bush, Hernandez-Santin, Hes, 2020)

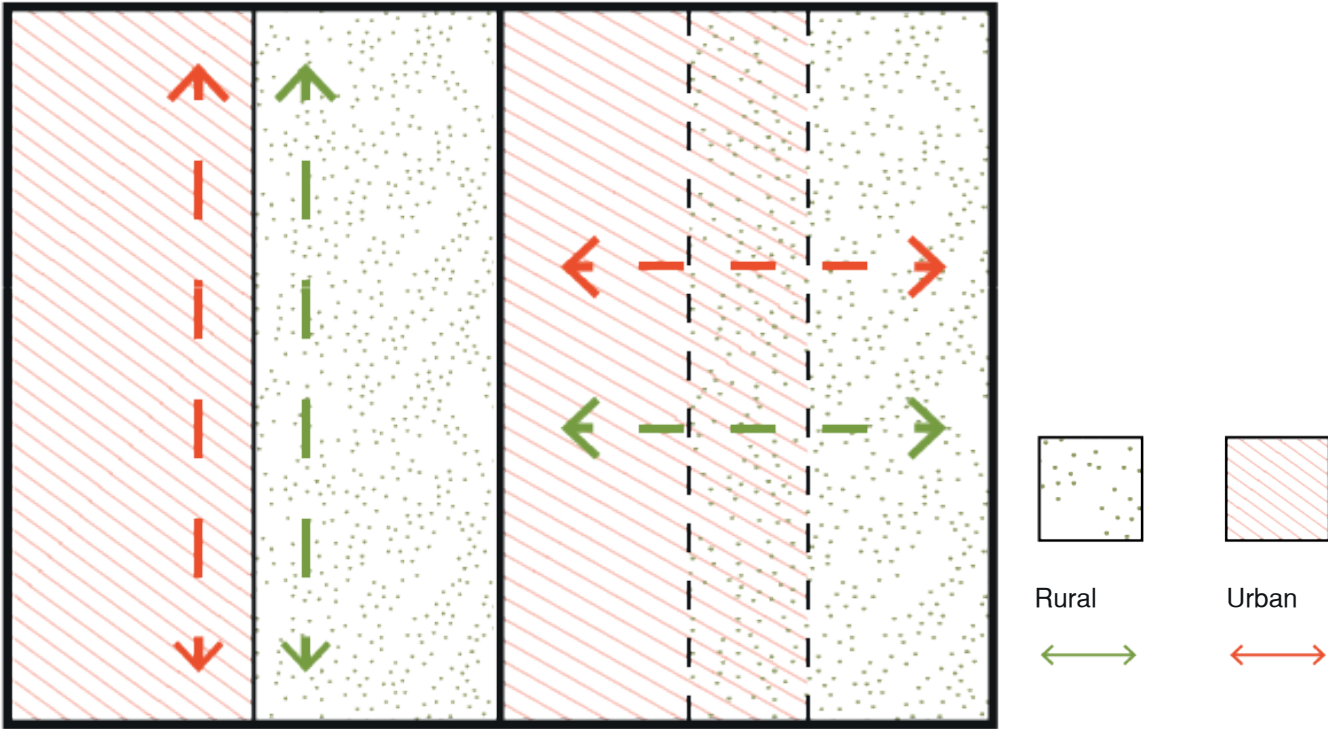


Image retrieved from: findasenseofplace.com

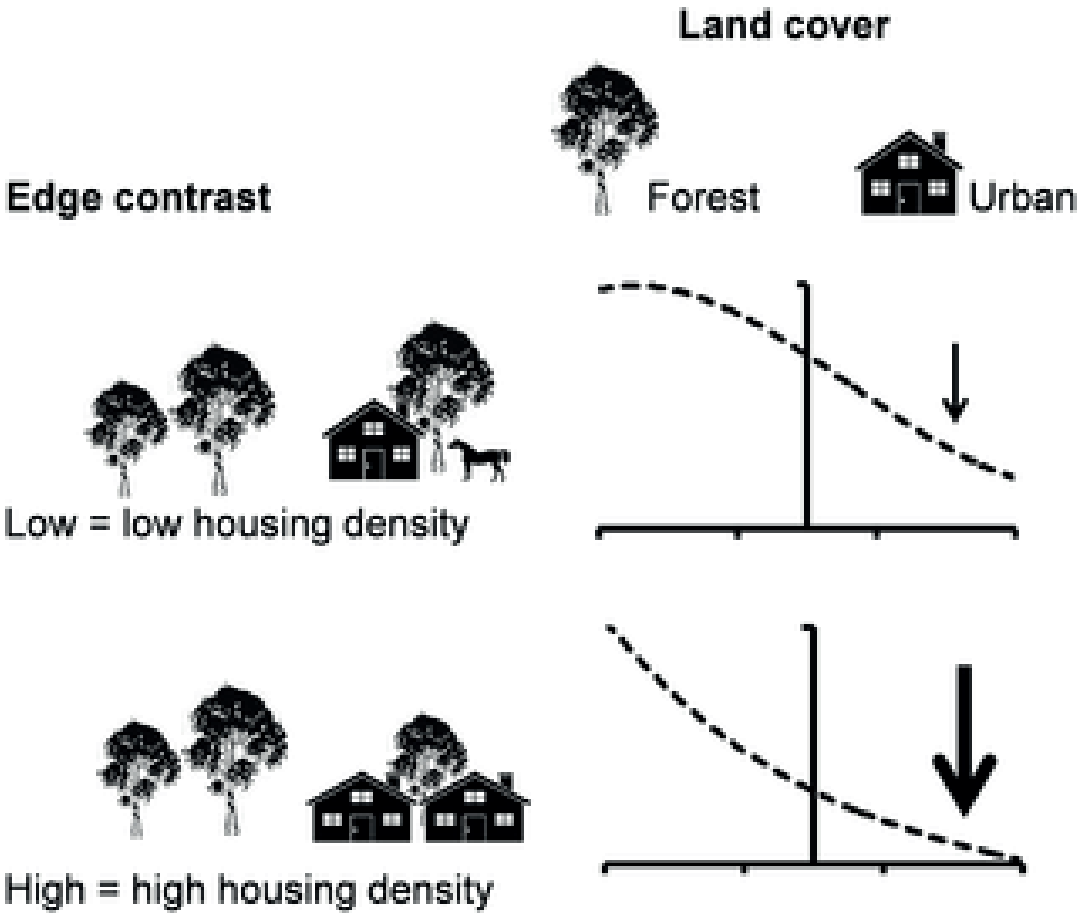
LANDSCAPE ECOLOGY THEORY



Conceptual representation of Patch corridor matrix model. Adapted from: Forman (1995)



Conceptual representation of design principles for patch edges and boundaries. Adapted from: Dramsta, Olsen & Forman (1996)



Villaseor, N. R., Driscoll, D. A., Escobar, M. A., Gibbons, P., & Lindenmayer, D. B. (2014). *Urbanization impacts on mammals across urban-forest edges and a predictive model of edge effects.*

High edge contrast



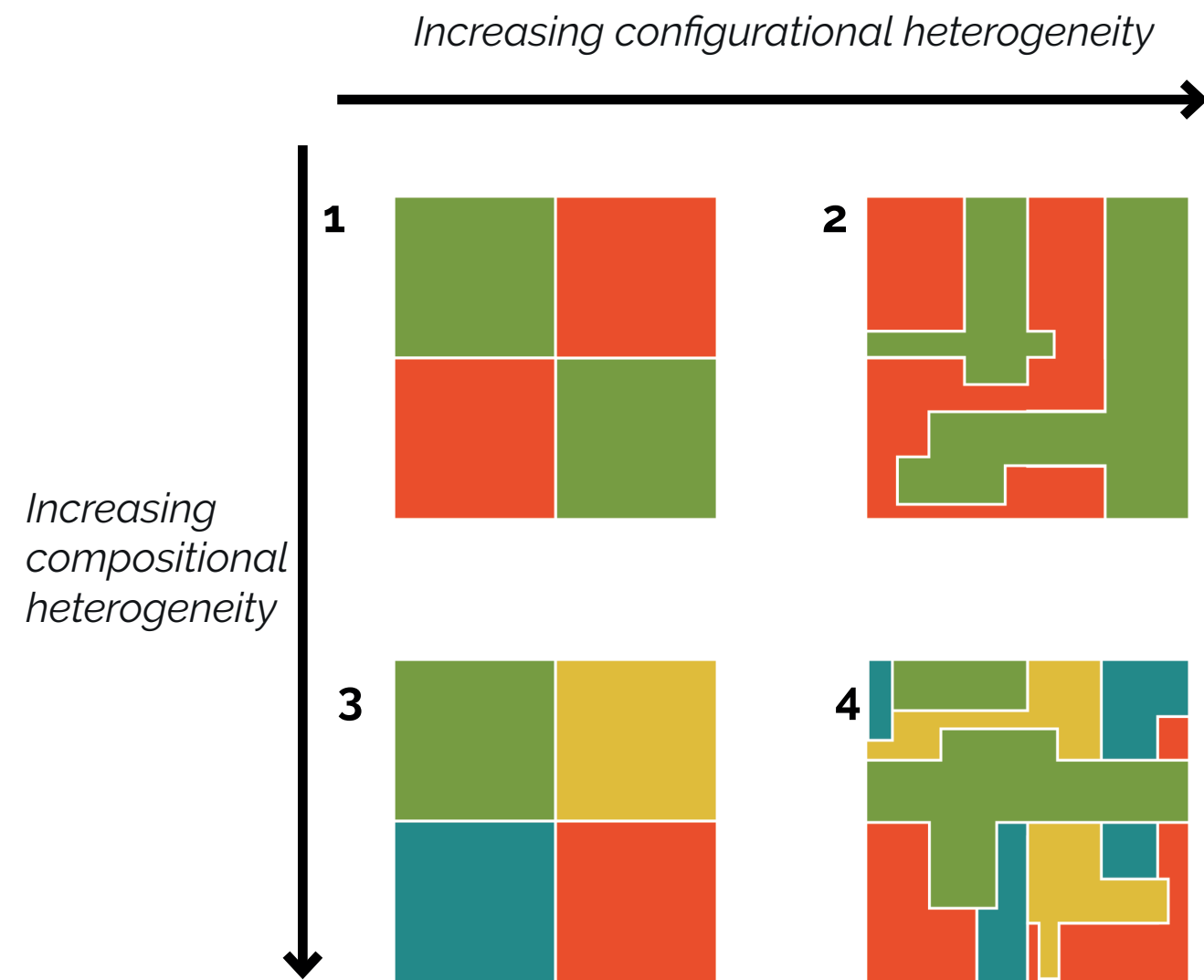
Urban-rural boundary of Houten
(Google Earth Imagery)

Low edge contrast

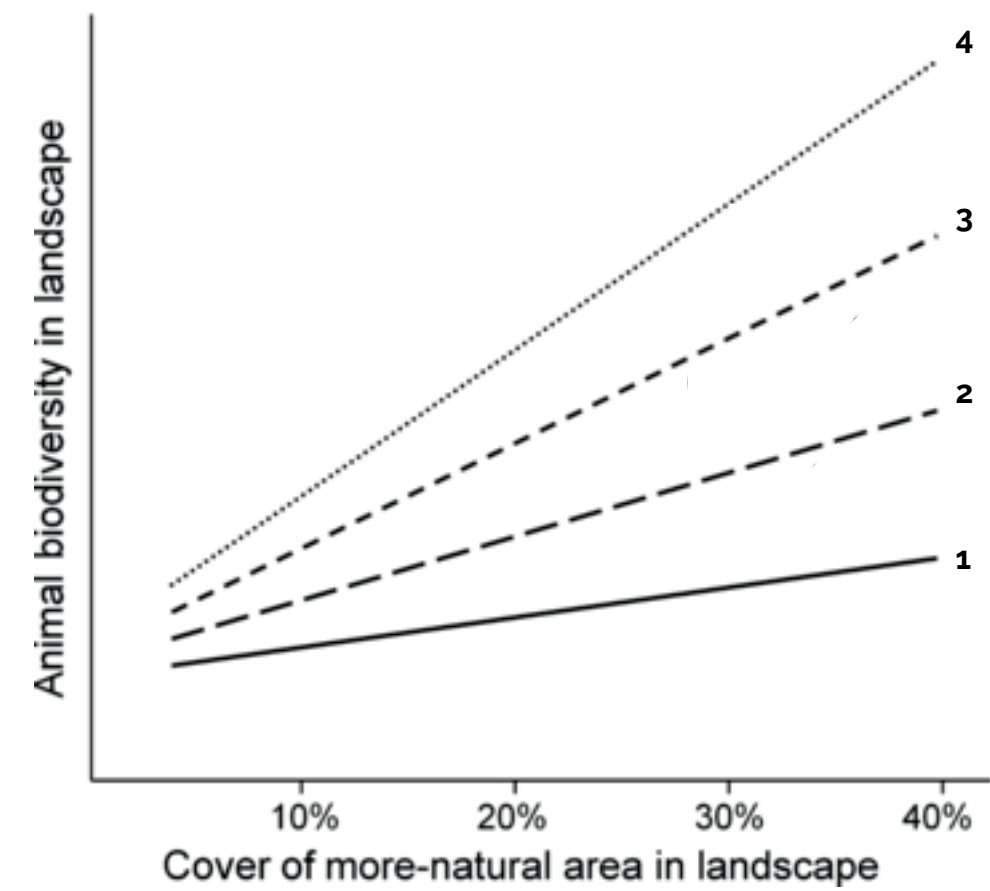


Urban-rural boundary of Breda
(Google Earth Imagery)

DESIGNING FOR HETEROGENEITY



Adapted from: Fahring et al. (2011) figure 3 pag. 104.



Adapted from: Fahring et al. (2011) figure 4 pag. 105.

HETEROGENEITY PATTERNS IN THE TIB

1



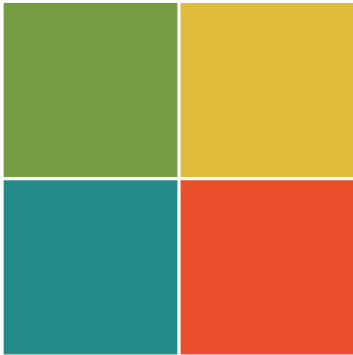
Business area Rotterdam North-west

2



Recreational district Oostvoorne

3



Mixed district Hoek van Holland

4



Mixed district Capelle a/d IJssel

SITE ANALYSIS



SITE VISITS



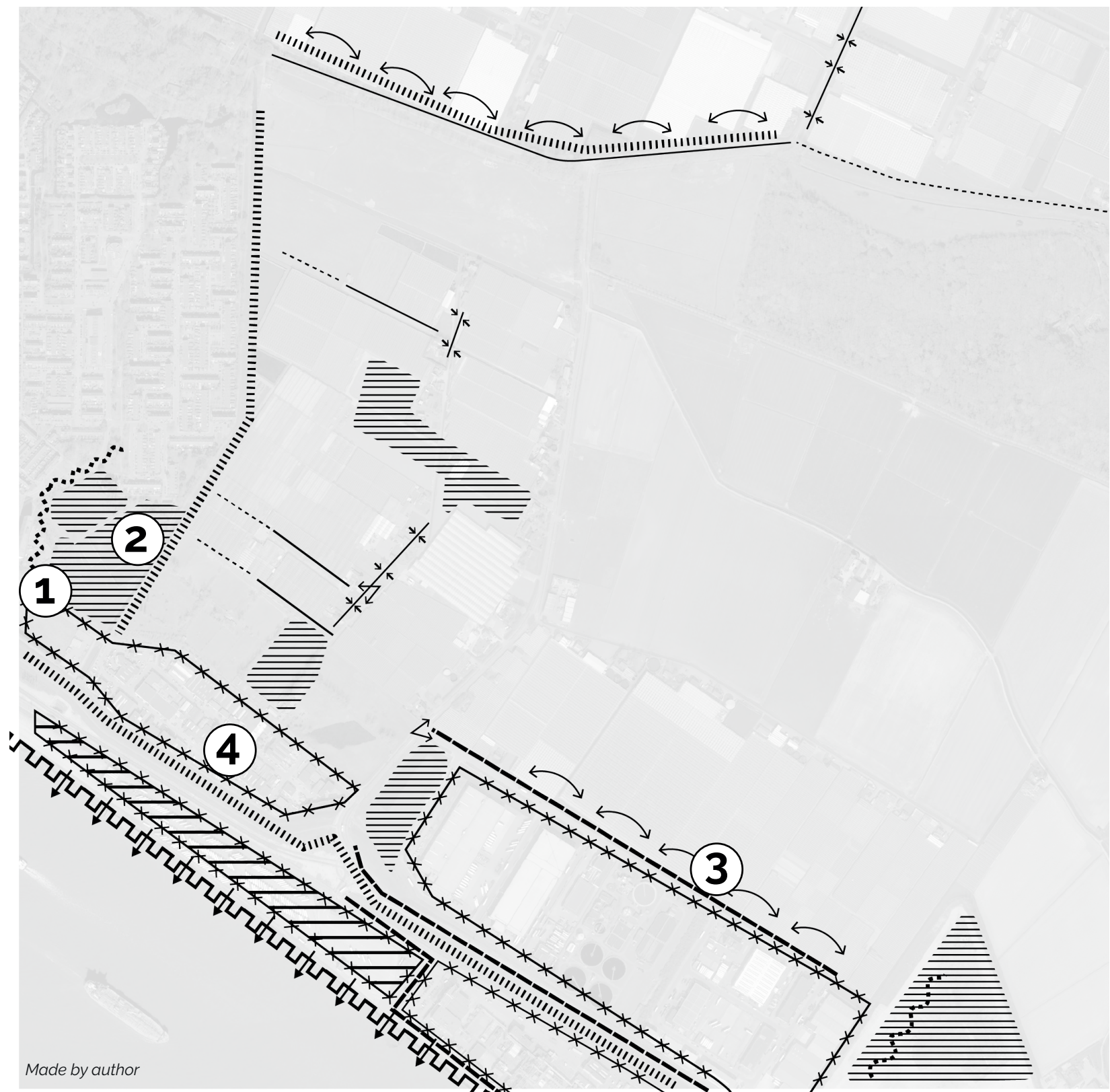
HOEK VAN HOLLAND - DE HAAK



Google earth imagery

COGNITIVE ANALYSIS

Cognitive map



Made by author

1.



Neglected spaces

3.



Repetitive spaces

2.



Underused and anonymous spaces

4.

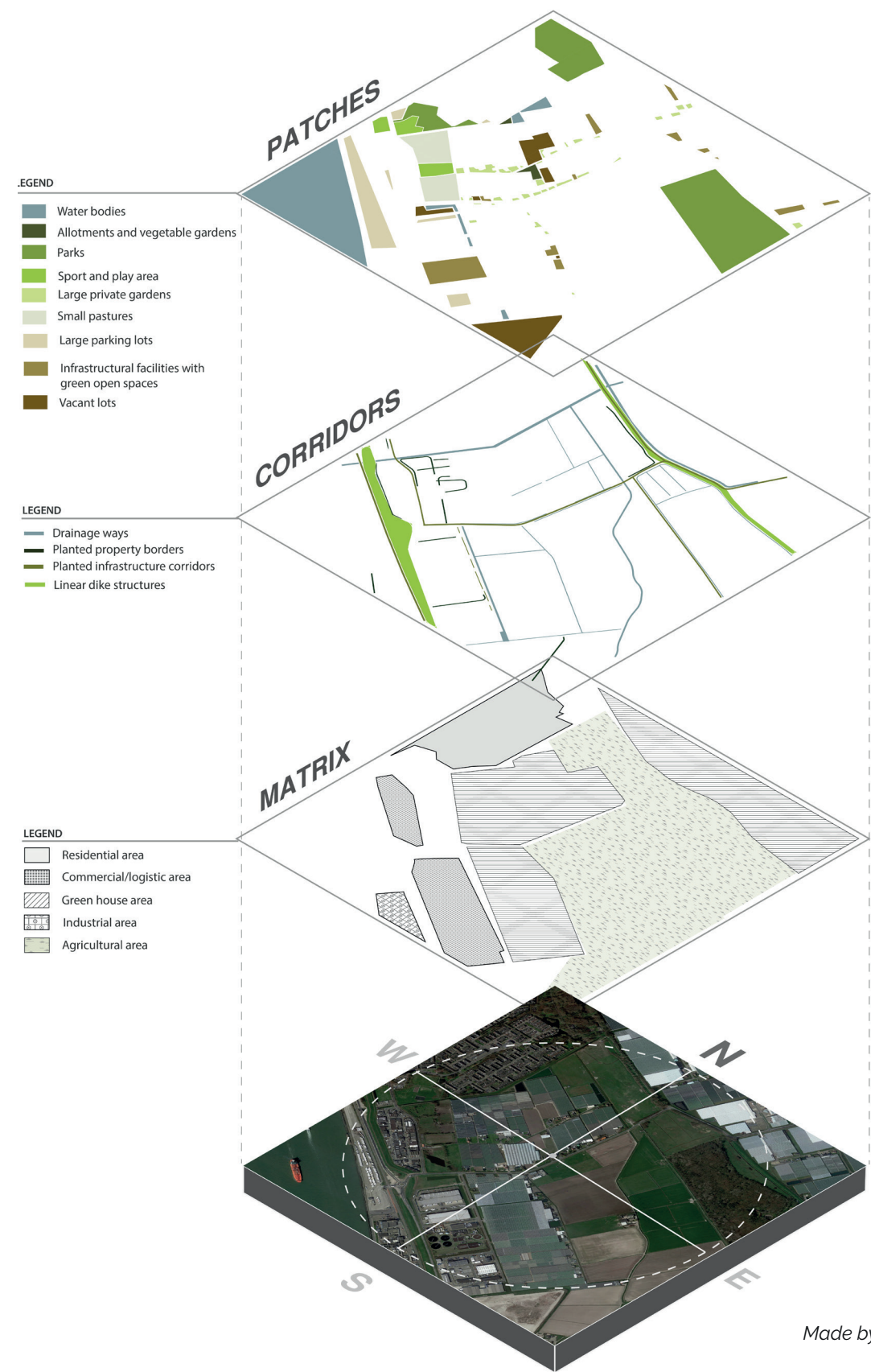


Industrial/logistic area isolated from surroundings

Legend	
	lack of differentiation
	characterless/underused area
	isolated area
	characterless path
	enclosed path
	broken path/ missing
	physical barrier
	unclear boundary
	hidden waterfront

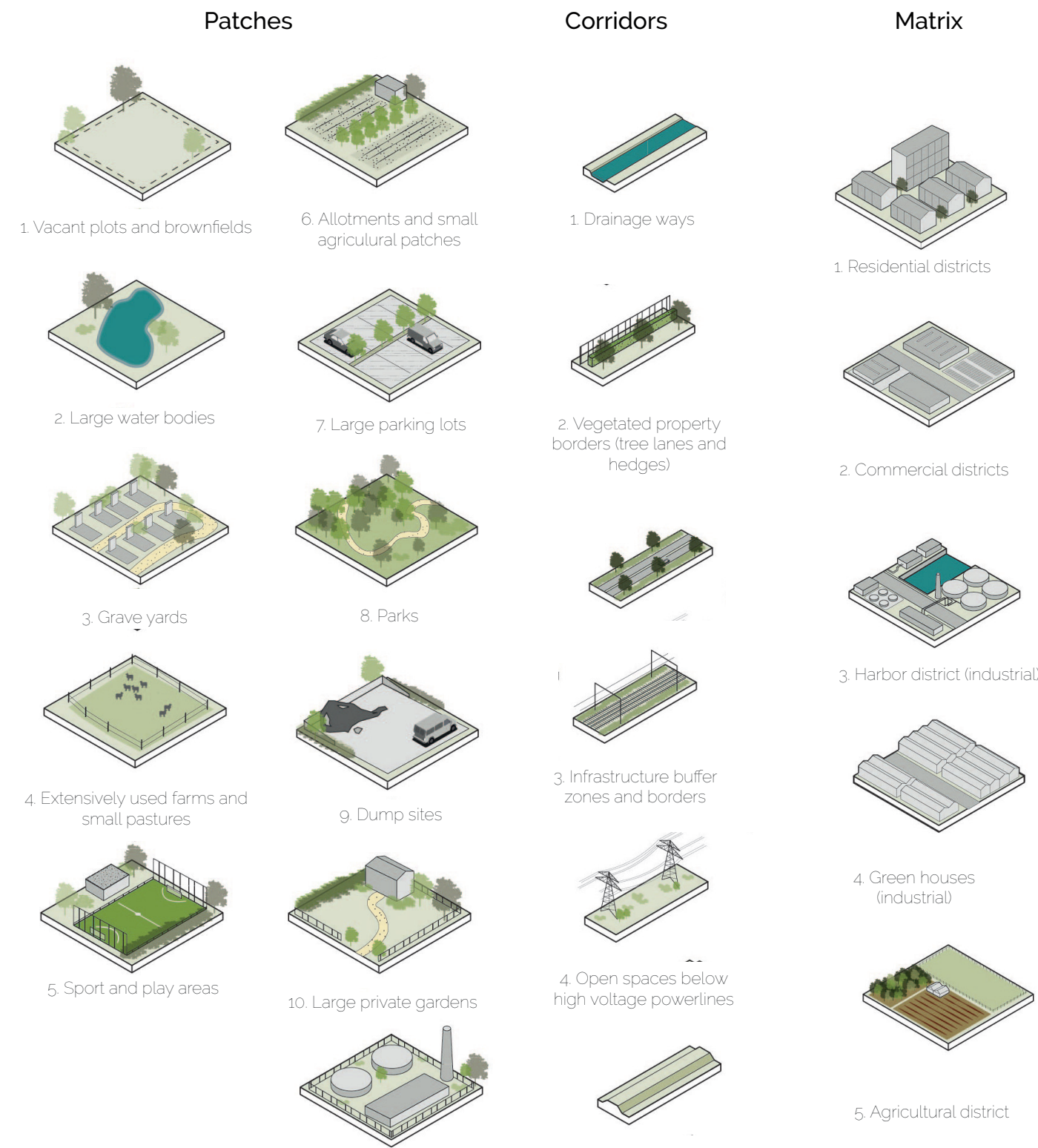
Pictures taken by author.

ECOLOGICAL ANALYSIS



Made by author

LANDSCAPE ELEMENTS OF THE TIB



Made by author

MAIN FINDINGS

- Great differences in spatial quality and landscape heterogeneity

Common problems

- **Poor spatial legibility** and integration of land uses of the landscape
- **Lack of human scale**
- **Poor accessibility** for the public
- **Limited activity** (program) for the public
- Abundance of **underused green spaces**
- Lack of **planting diversity** and site specificness.
- Spatial **fragmentation** of green spaces.



Pictures by author

A wide-angle landscape photograph. In the foreground, a lush green field stretches across the frame. A modern, minimalist ping-pong table with a grey top and dark legs sits on a small concrete pad in the middle ground. Behind the field, a white, single-story building with several windows and doors is visible. To the left of the building, a wind turbine stands. To the right, another wind turbine is visible, along with a tall, thin communication tower. The background is filled with more trees and a sky filled with large, white, fluffy clouds. The overall mood is serene and modern.

DESIGN PRINCIPLES

COGNITIVE DESIGN PRINCIPLES



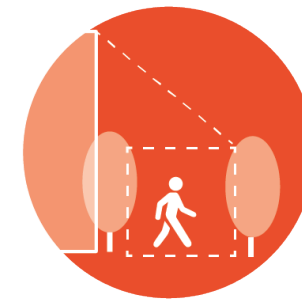
Legibility & imageability



Activity & interaction

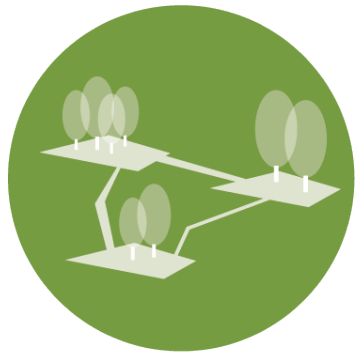


Accessibility & transparency

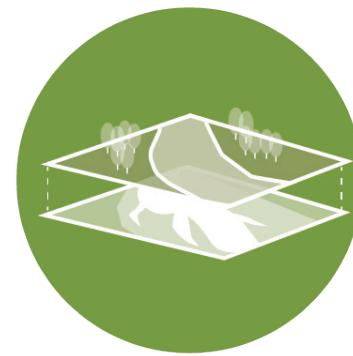


Human scale & complexity

ECOLOGICAL DESIGN PRINCIPLES



Ecological connectivity



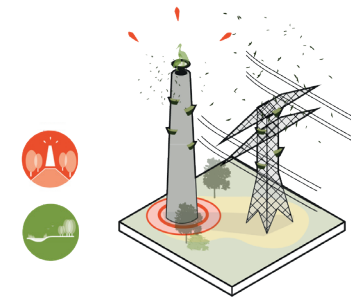
Local Nature



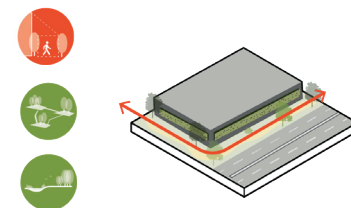
Habitat Diversity

NATURE-BASED PLACEMAKING ELEMENTS

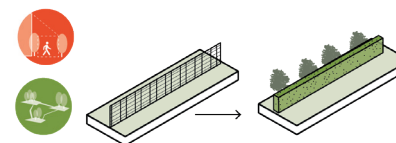
COMFORT & IMAGE



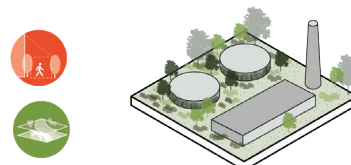
1. Nesting facilities on tall infrastructures



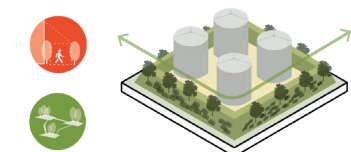
2. Green walls on warehouses and industrial facilities



3. Vegetated property borders.

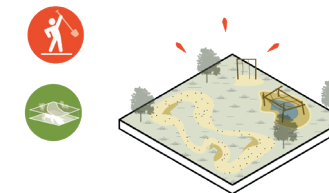


4. Re-wilding of open spaces in-between infrastructural facilities

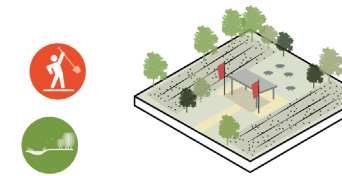


5. Planting on bund walls, dikes, sound barriers etc.

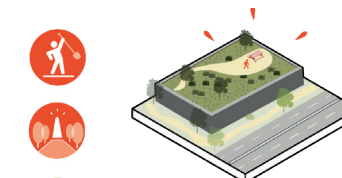
USES & ACTIVITIES



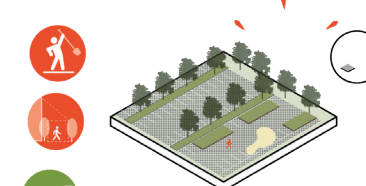
1. (temporal) recreational use of brownfields and development sites



2. Local consumers and recycling point at allotment gardens.

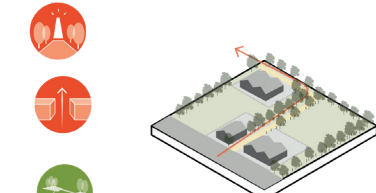


3. Accessible rooftop parks on large commercial and logistic buildings.

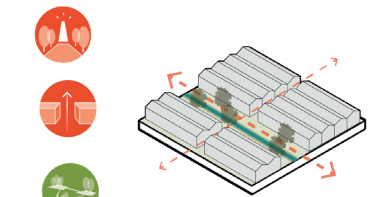


4. (temporal) public greening of grey leftover spaces and parking lots.

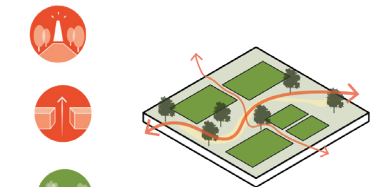
ACCESS & LINKAGES



1. Informal (semi-public) accessible corridors in-between private lands.

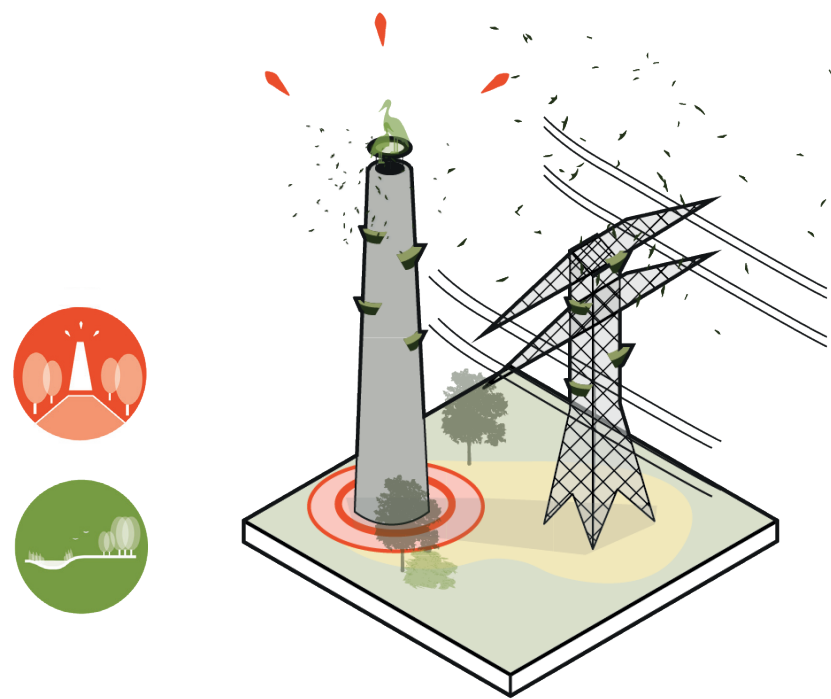


2. Paths and green corridors in-between open spaces between green houses.

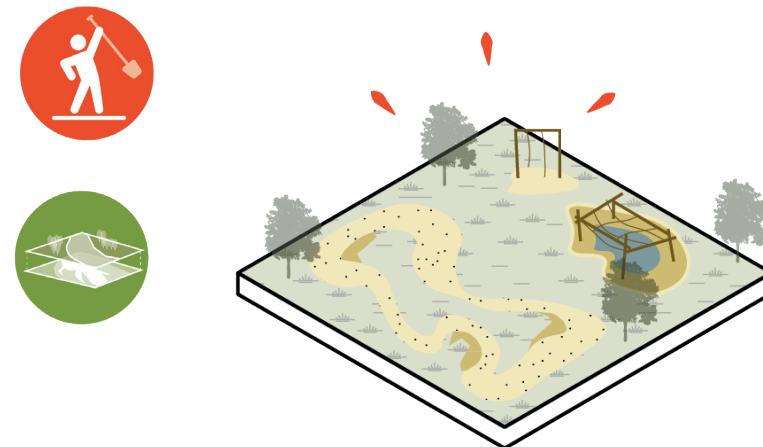


3. Planting corridors and semi-public access in-between sport fields on private property.

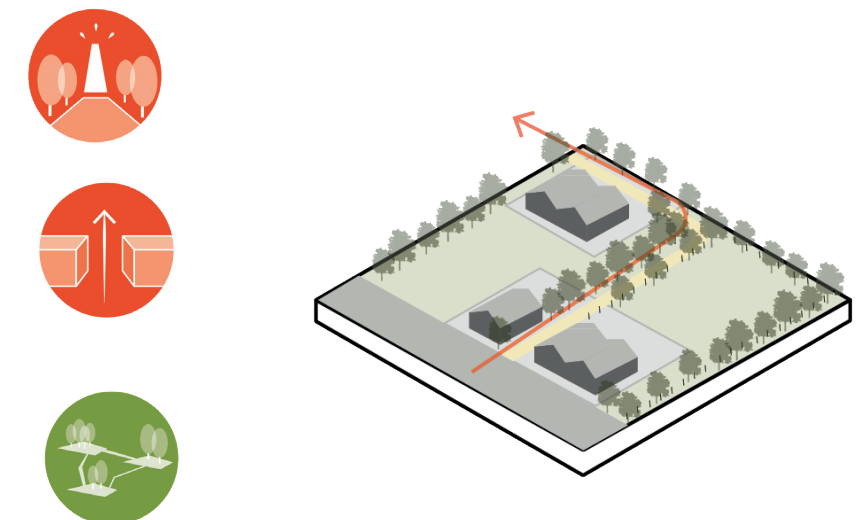
NATURE-BASED PLACEMAKING ELEMENTS



Nesting facilities on tall infrastructures



(temporal) recreational use of brownfields and development sites

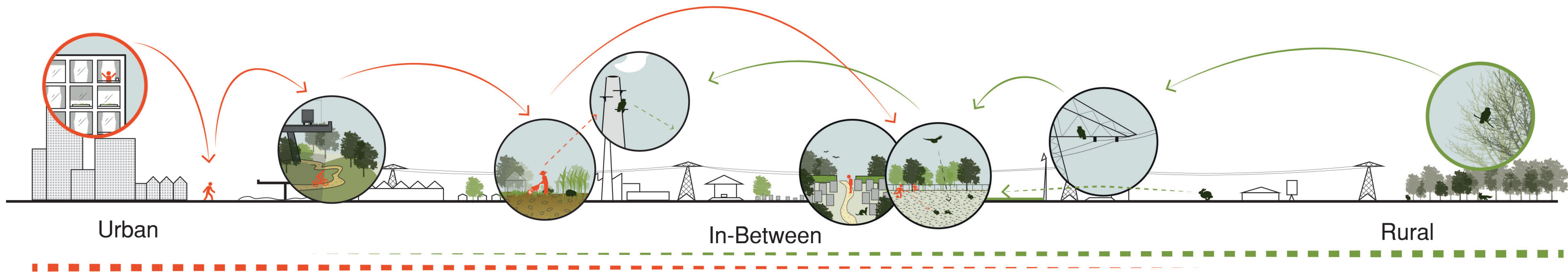
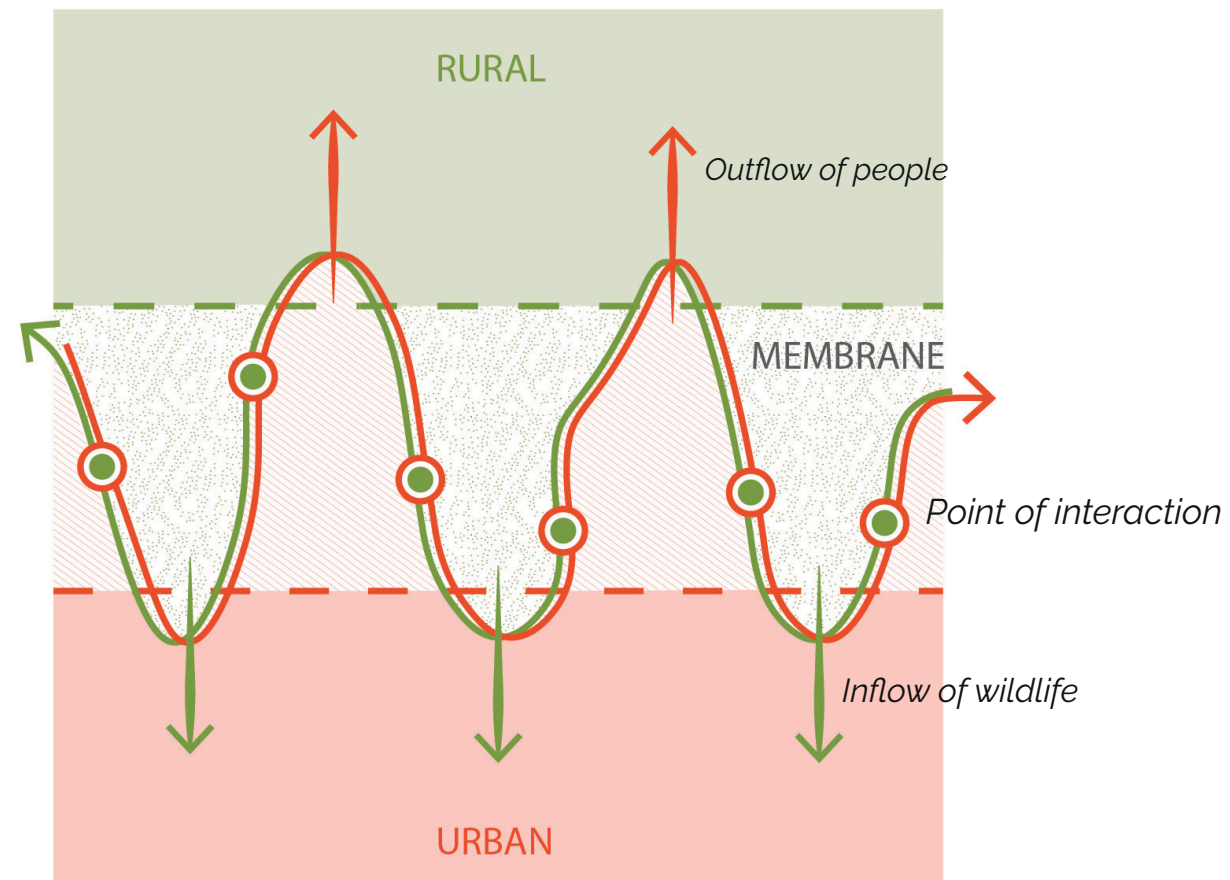


Informal (semi-public) accessible corridors in-between private lands.

REGIONAL VISION



THE TERRITORY IN-BETWEEN AS **MEMBRANE** LANDSCAPE

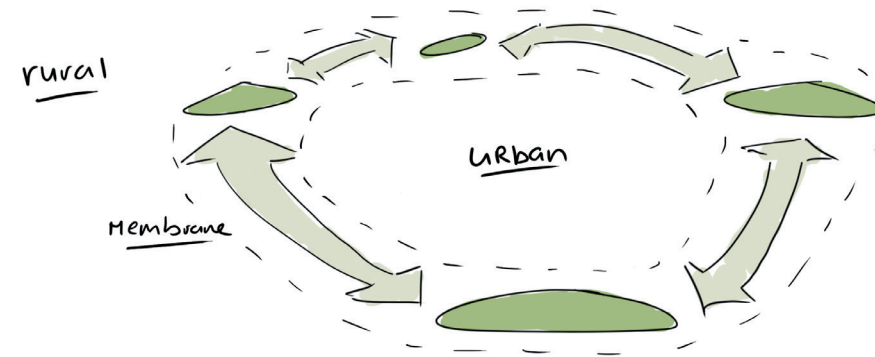


GREEN STRUCTURE OF ROTTERDAM

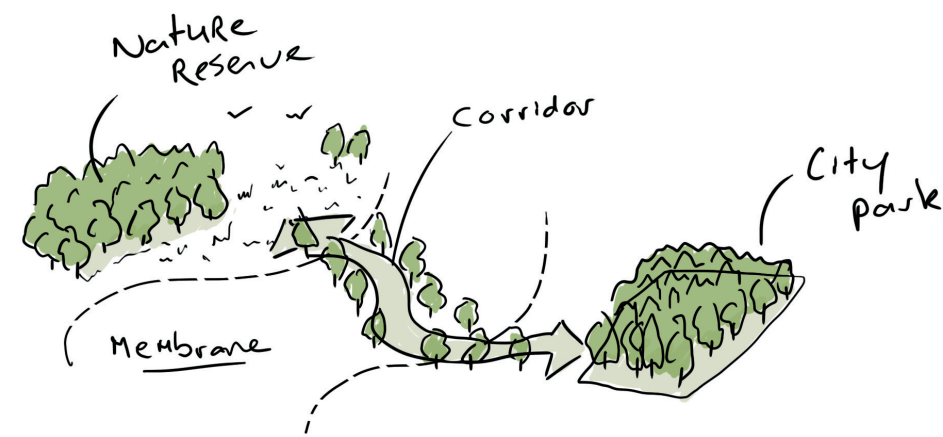


- Green patches of recreational and natural value
Parks / Sport field / Public gardens / graveyards etc.
- (peri) Urban green "leftover" spaces
infrastructure borders / private green / green without function
- Open agricultural landscape

1. THE MEMBRANE STRUCTURE



2. ECOLOGICAL CONNECTIVITY



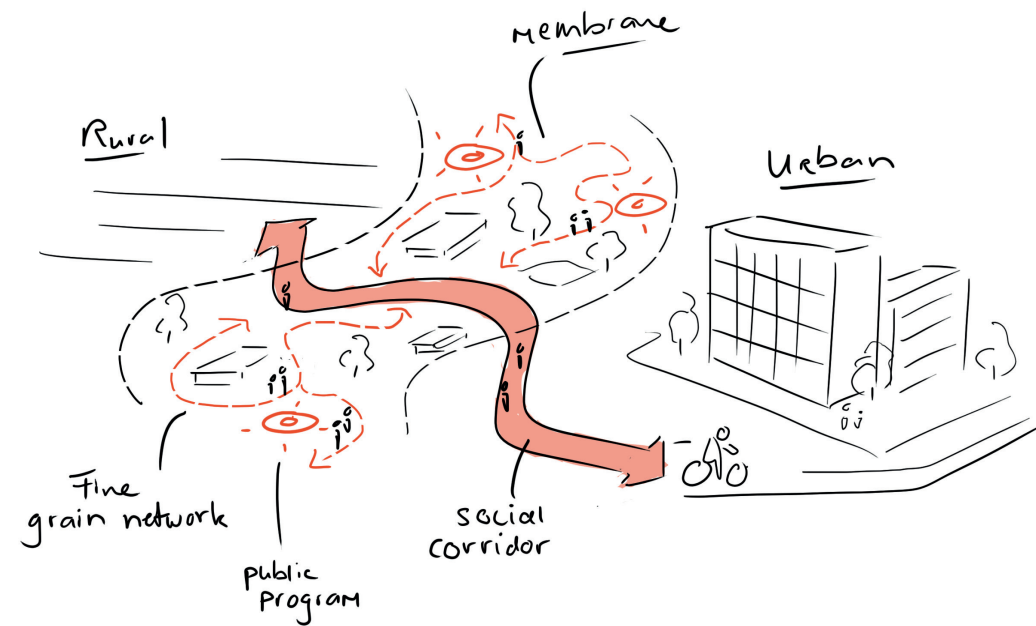
google Earth



Source: Making Urban Nature (2017)



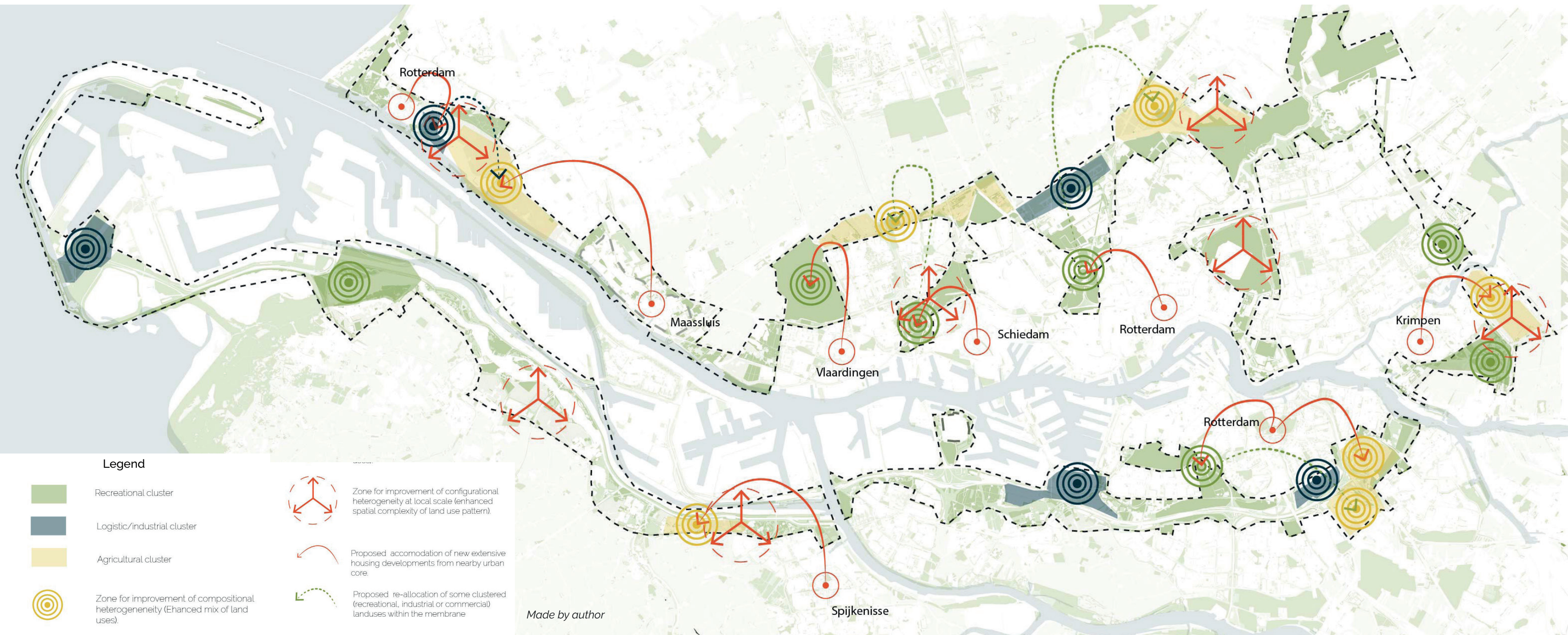
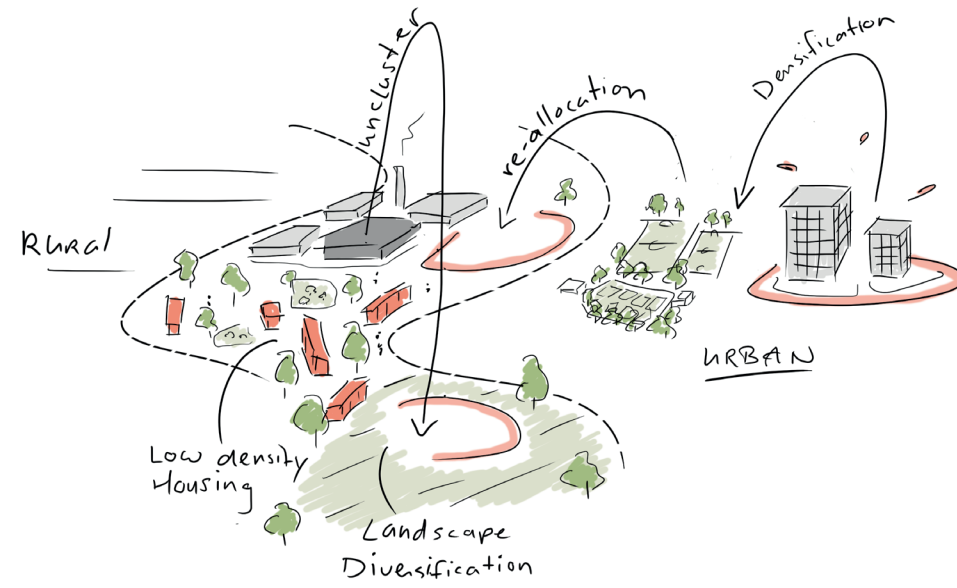
3. PEOPLE AND WILDLIFE INTERACTION



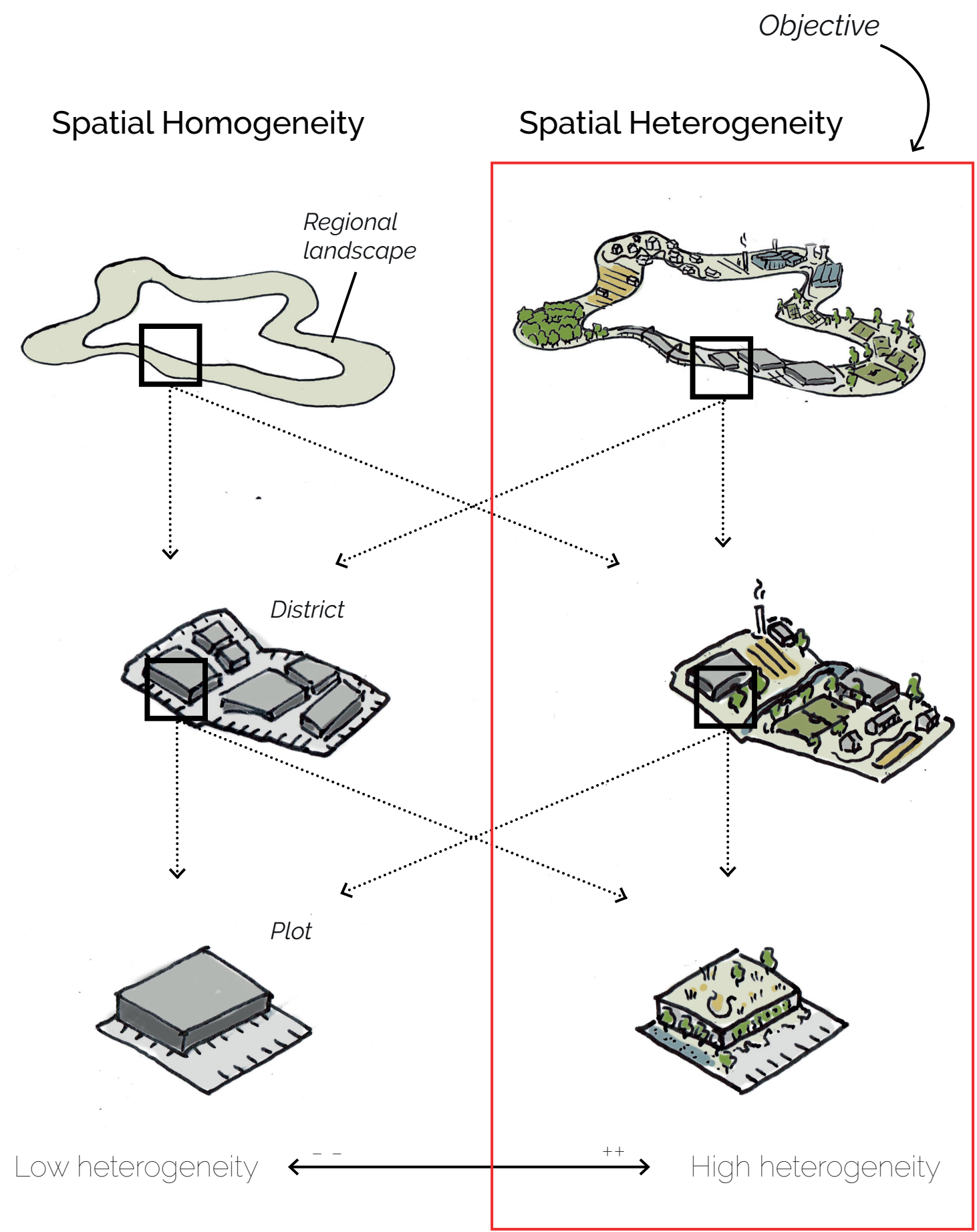
Picture by: Corinna Vullhorst
retrieved from: https://www.nw.de/lokal/kreis_paderborn/hoevelhof



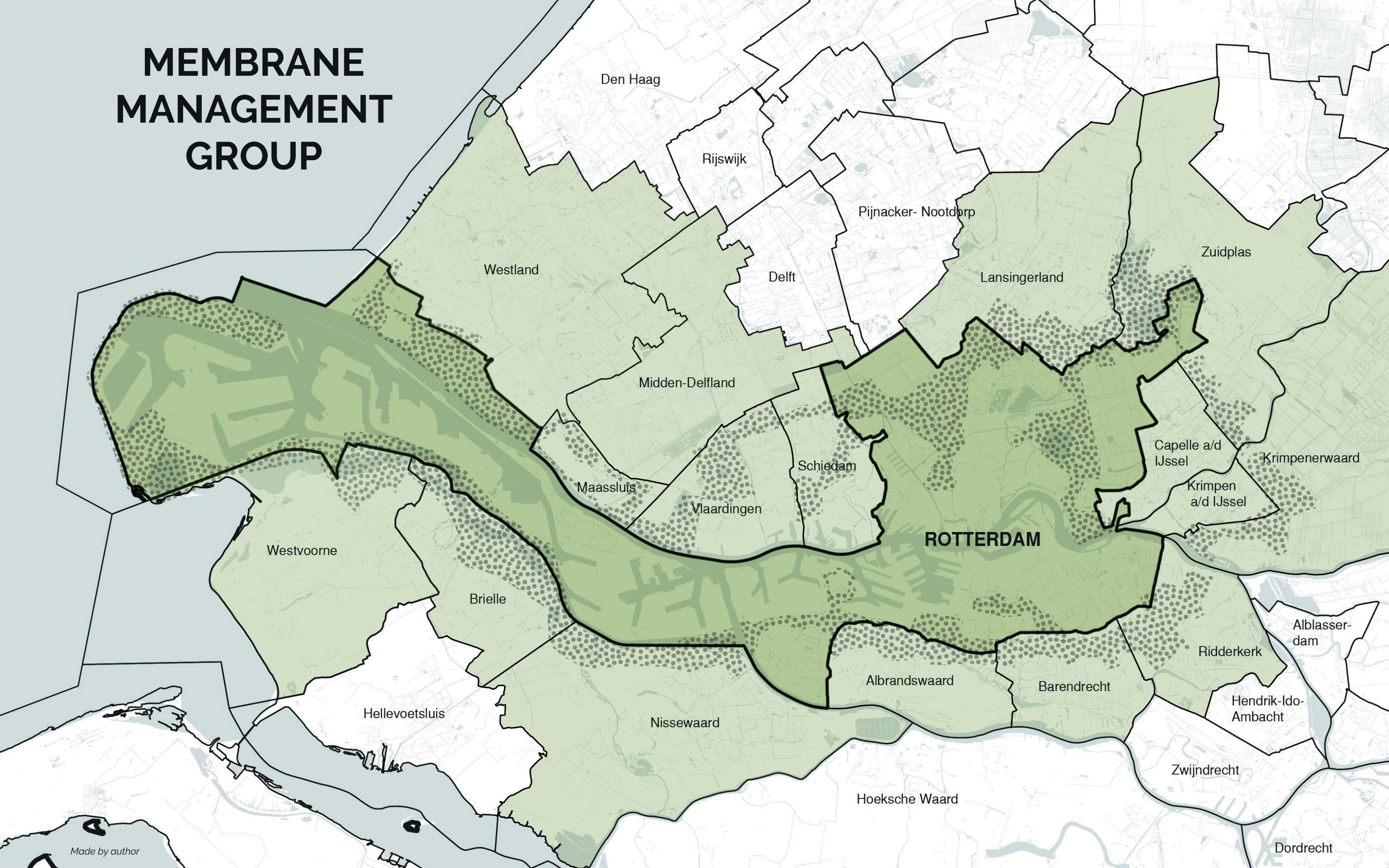
4. HETEROGENEOUS LANDSCAPE



HETEROGENEITY THROUGH THE SCALES



MEMBRANE MANAGEMENT GROUP



LOCAL INTERVENTION

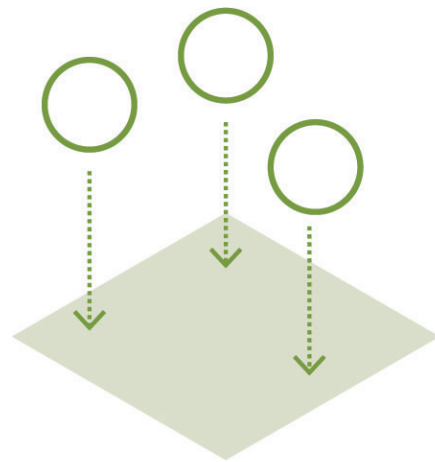
HOEK VAN HOLLAND - DE HAAK

THE SITE

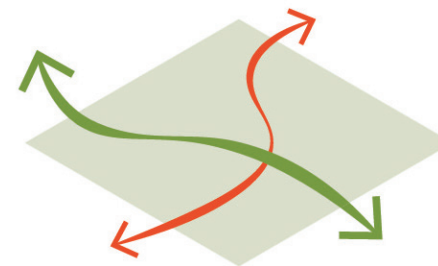


Image google earth

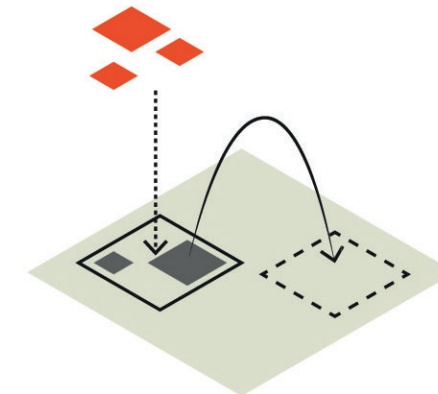
STAGES OF DEVELOPMENT



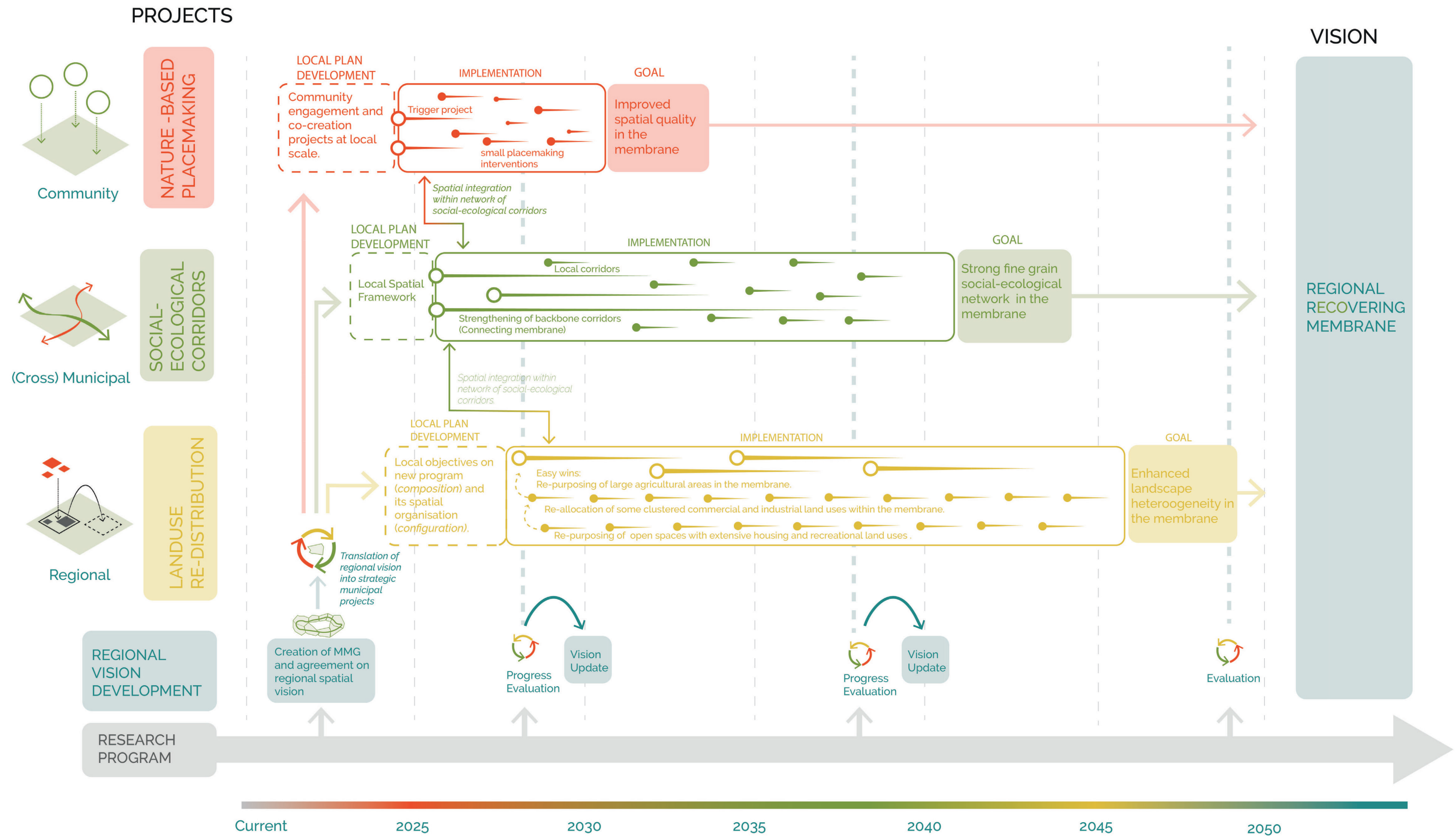
1. Nature based
placemaking
short term (<10 yrs)



2. Interconnecting the
landscap
mid-term (10-20 yrs)

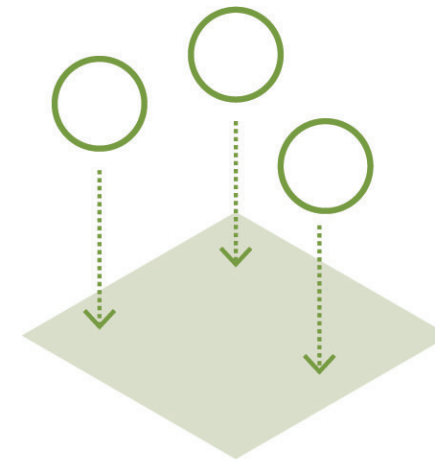


3. Re-distributing land uses
long term (>20 yrs)



STAGE 1

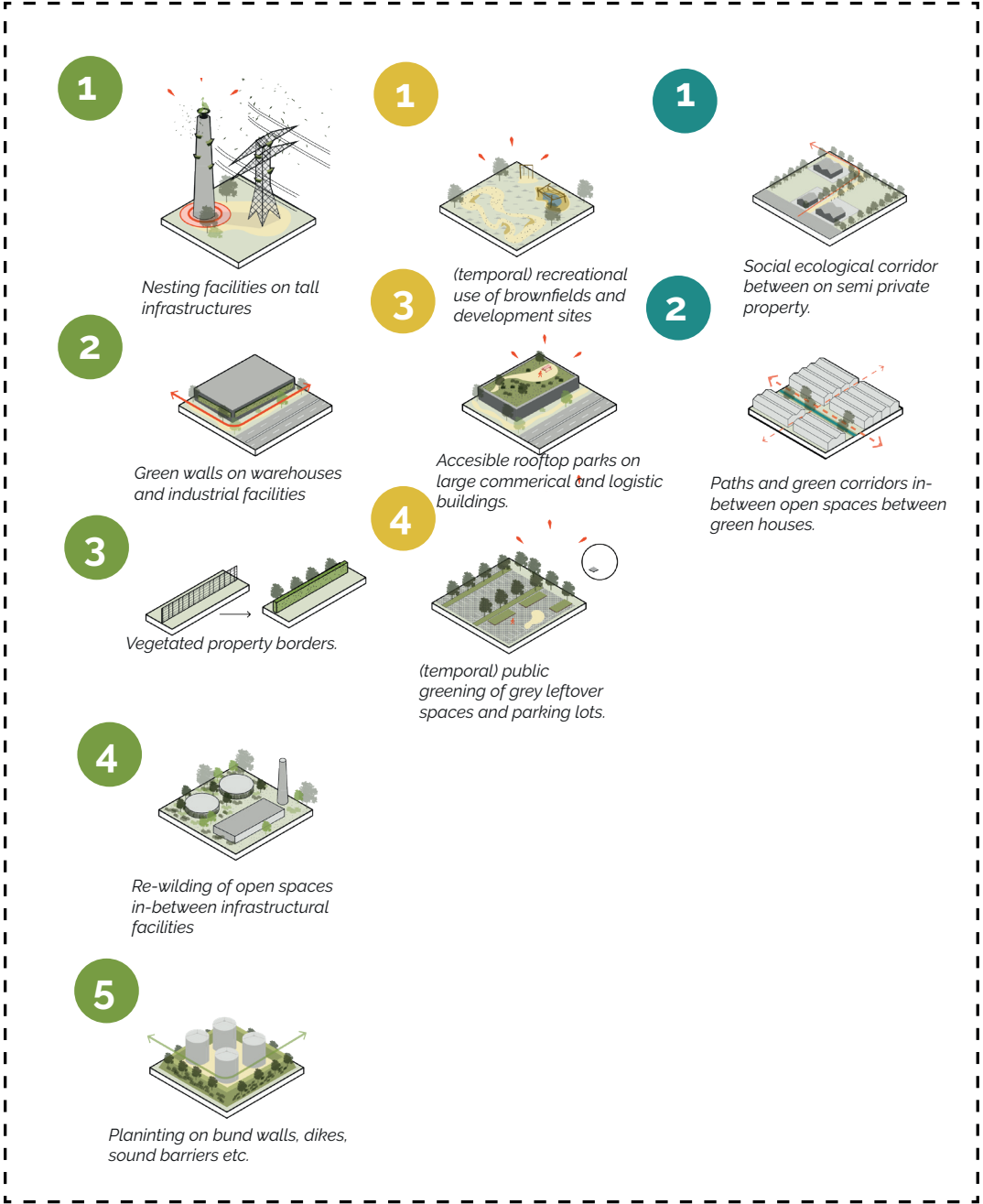
NATURE-BASED PLACEMAKING



AIM

Improving spatial quality within the membrane through low cost and short term interventions in co-creation with the local community.

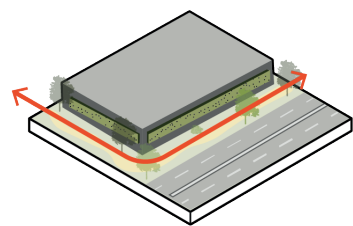
NATURE-BASED PLACEMAKING INTERVENTIONS



Made by author



2



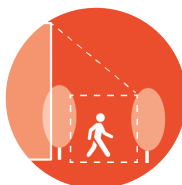
Green walls on warehouses and industrial facilities



Space improvements



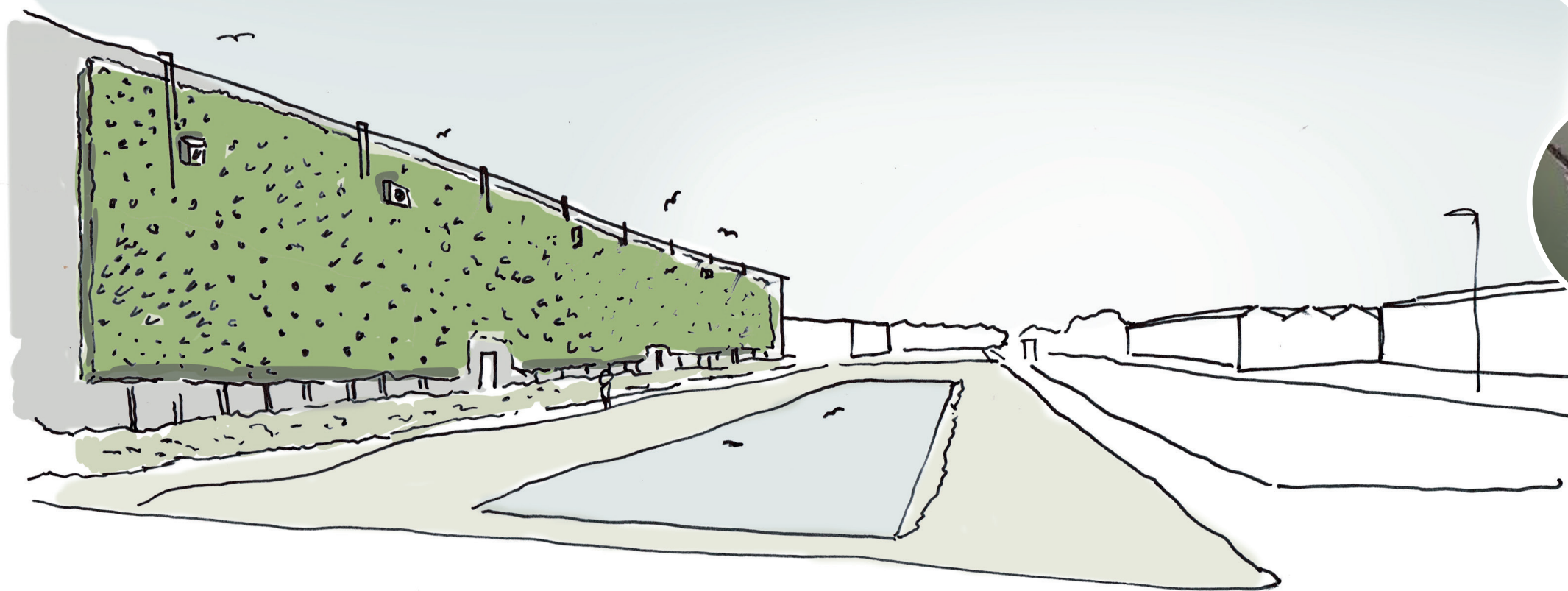
+ Legibility



+ Human scale

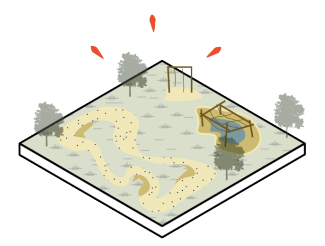


+ Habitat diversity



Spatial intervention: Kulkweg

1



*(temporal) recreational
use of brownfields and
development sites*



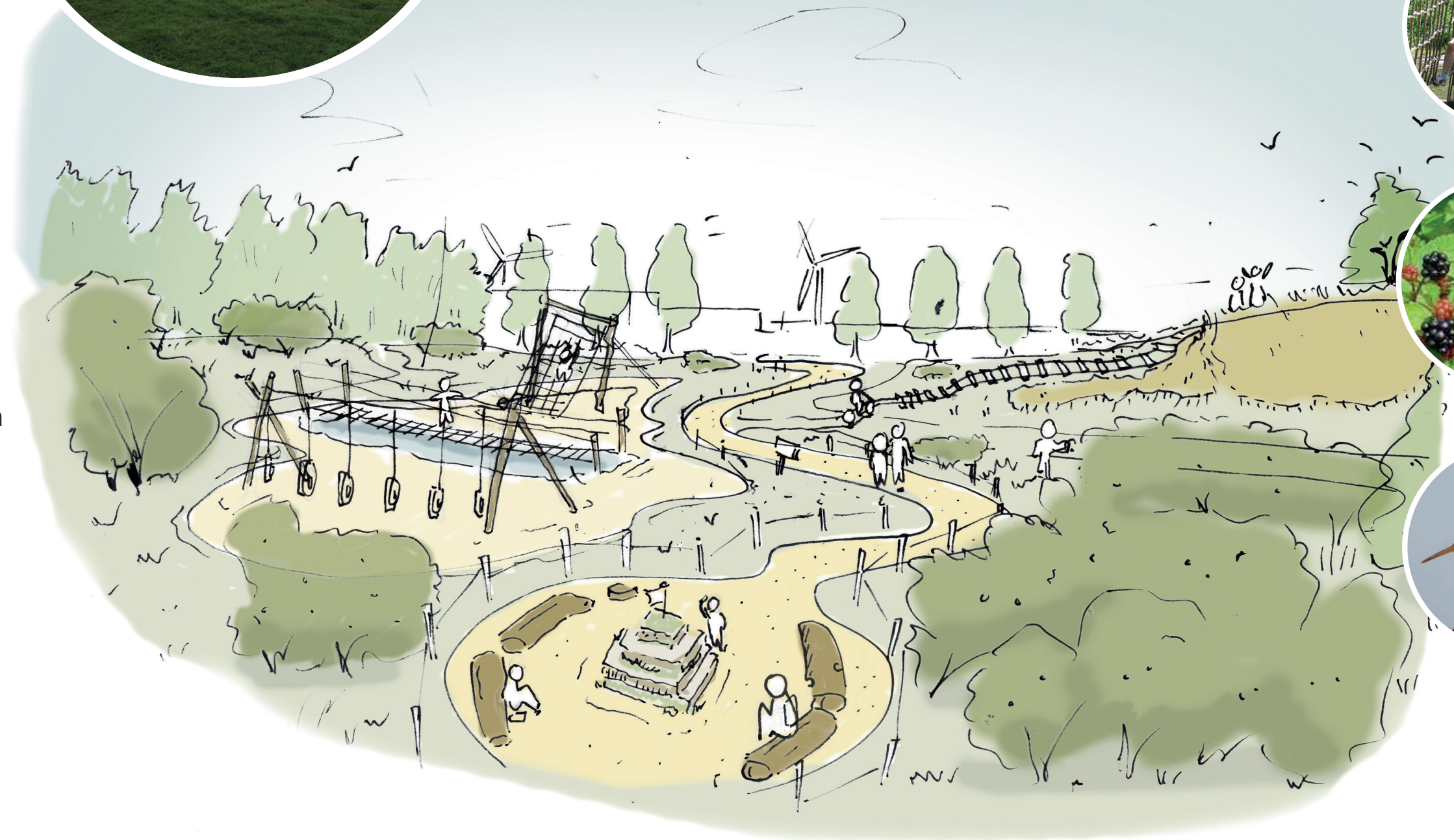
Space improvements



+ Activity and interaction

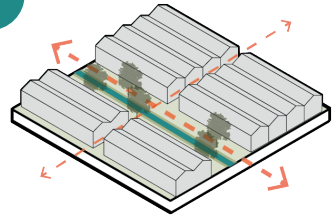


+ Habitat diversity



Spatial intervention: Prins Hendrikweg

2



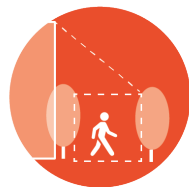
Paths and green corridors in-between open spaces between green houses.



Space improvements



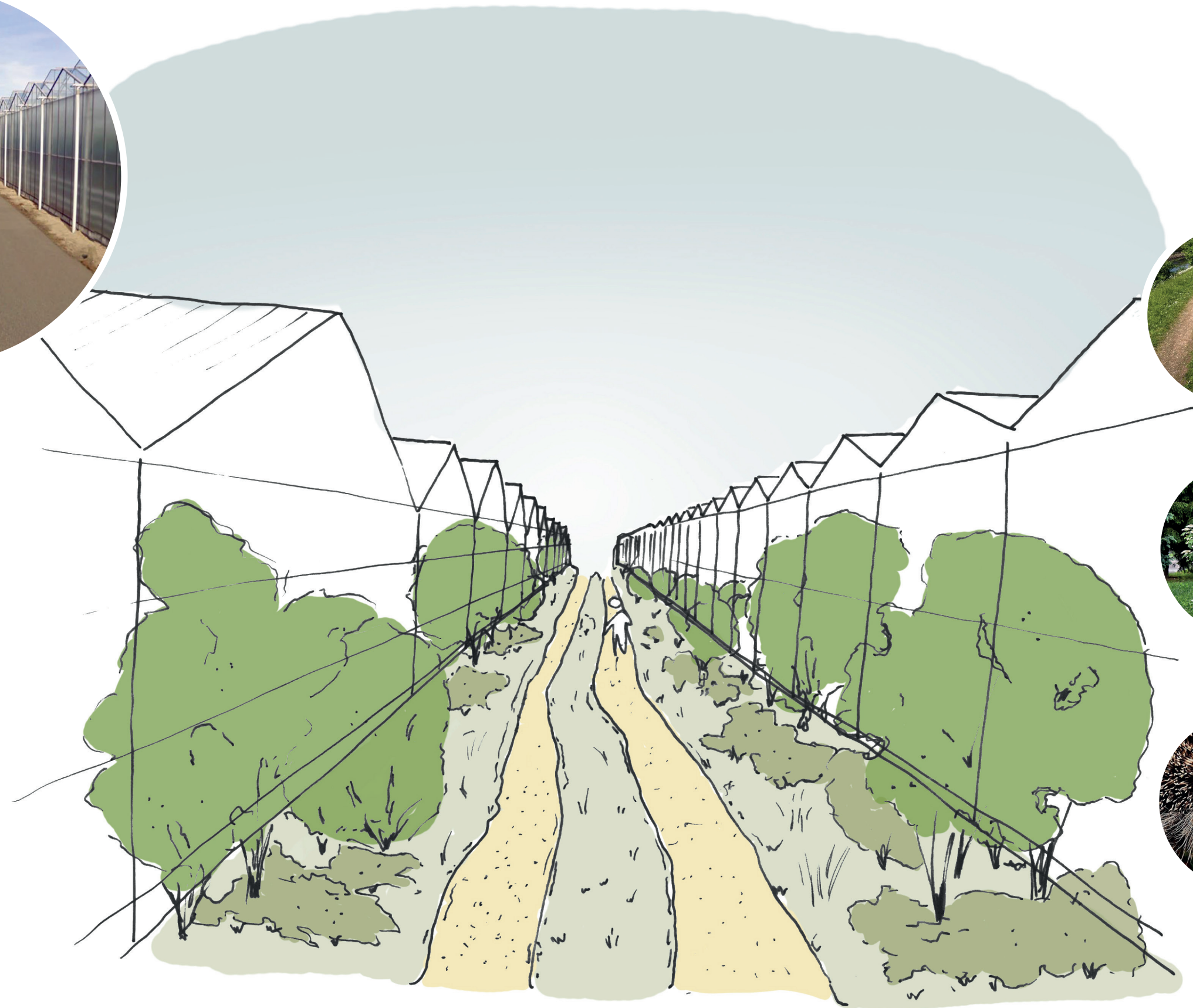
+ Improved accessibility
(active mobility)



+ Complexity and Human scale

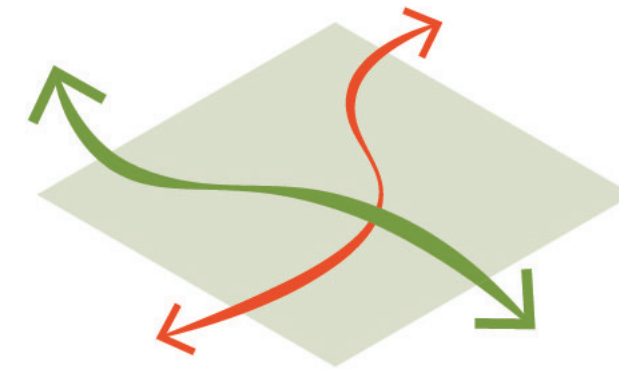


+ Ecological connectivity



Spatial intervention: Haaklaan

STAGE 2 INTERCONNECTING THE LANDSCAPE



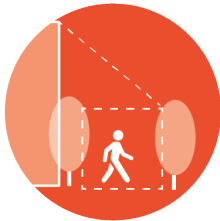
AIM

Improving social and ecological connectivity within the membrane.

FINE GRAIN SOCIAL-ECOLOGICAL NETWORK



Space Improvements



+ Spatial complexity



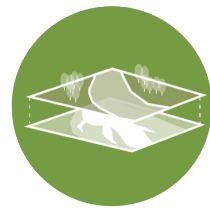
+ Legibility



+ Accessibility



+ Ecological



+ Local nature

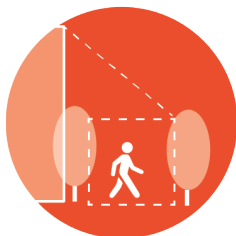


Spatial intervention: Bonnenweg

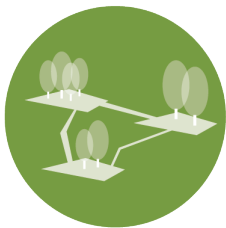
Space Improvements



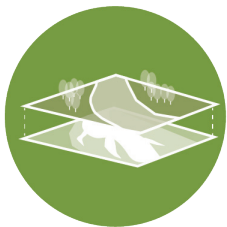
+ Interaction



+ Spatial complexity



+ Ecological connectivity

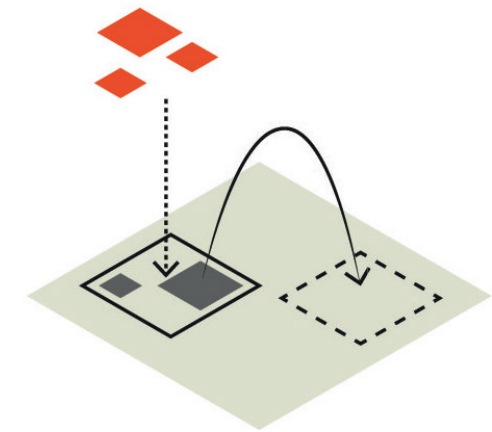


+ Local nature (spontaneous growth)



Spatial intervention: Kulkweg

STAGE 3 RE-CONFIGURATION OF LAND-USES

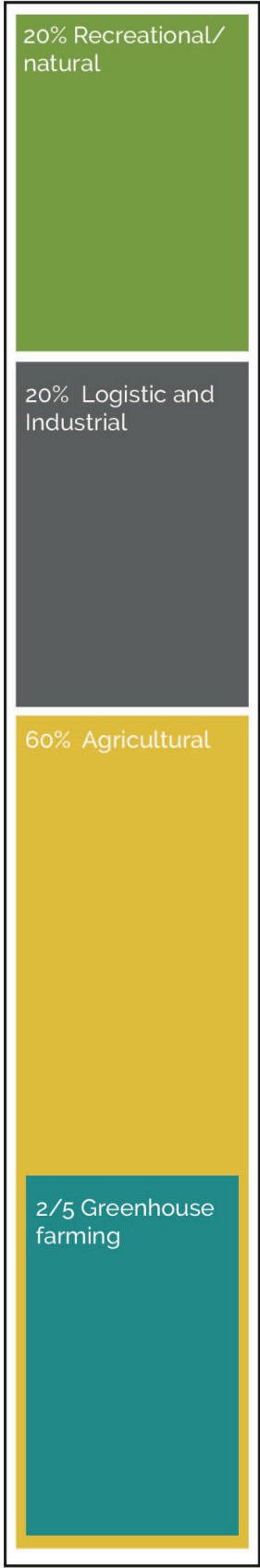


AIM

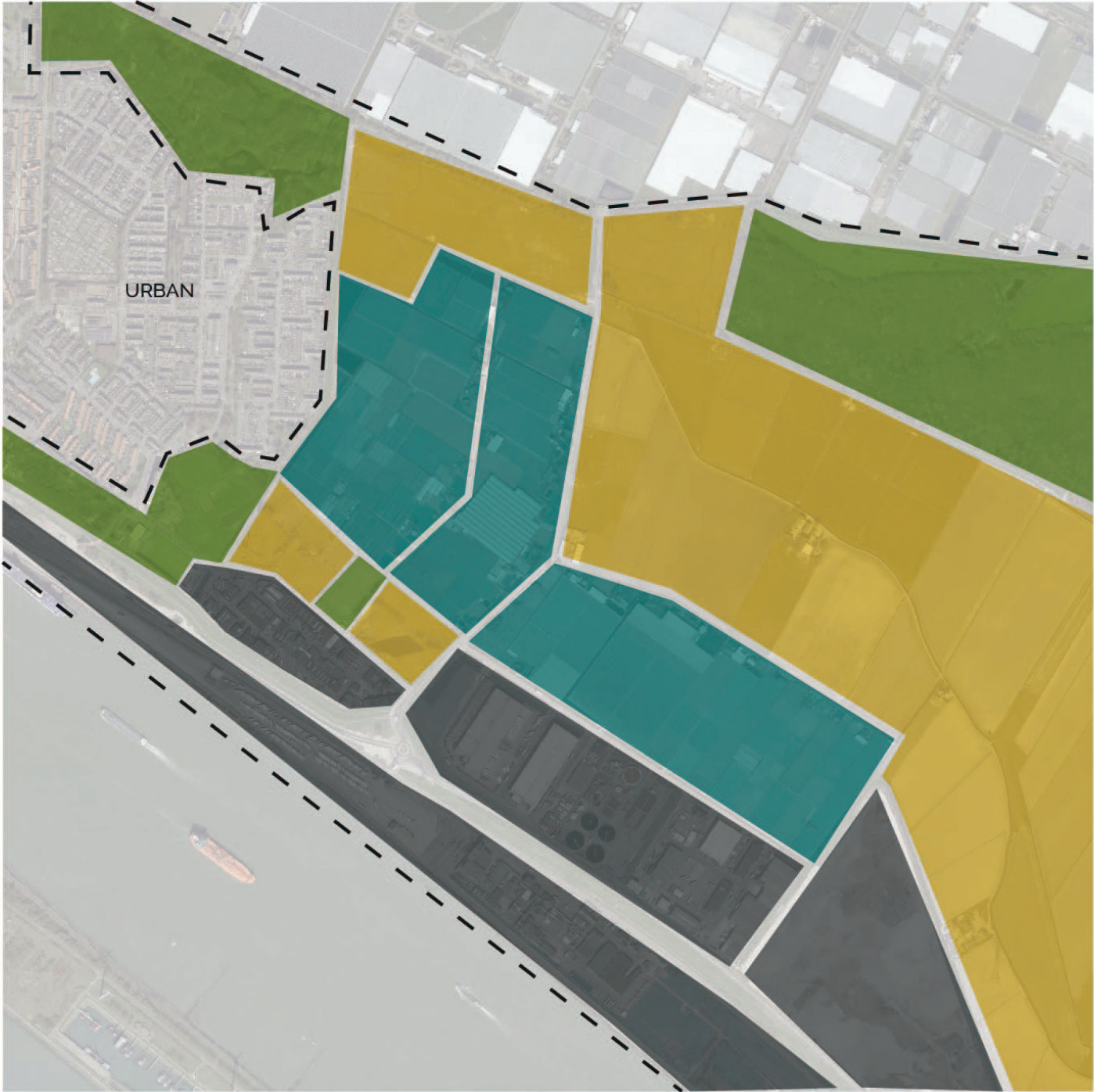
Enhancing overall landscape heterogeneity.

CURRENT SITUATION

Land cover composition



Land cover configuration



Proposed
land cover
composition



PROPOSED SITUATION

Proposed land cover configuration



THE HETEROGENEOUS MEMBRANE



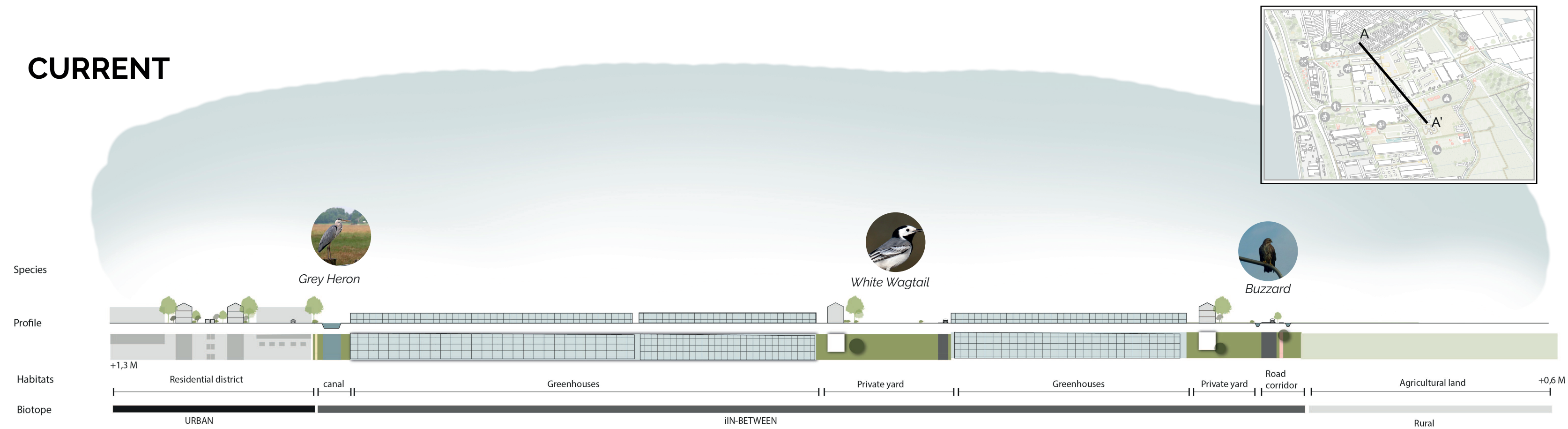
Legend

-  Allotment gardens
-  Natural playground
-  Dog train and play are
-  Sport field
-  Mountainbike trail
-  Horse riding school
-  Natural burial
-  Fishing spot
-  Camp site
-  Festival site
-  Day care farm

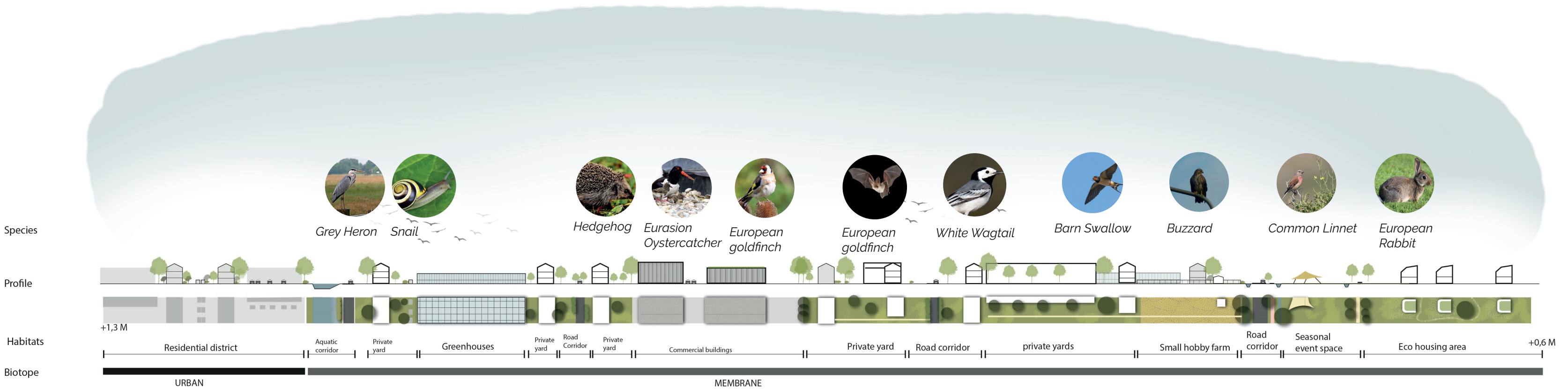
-  Recreational buildings
-  Logistic/industrial buildings
-  Residential buildings
-  Logistic/industrial area
-  Forest
-  Nature inclusive agriculture
-  Herbaceous grassland management type A
-  Herbaceous grassland management type B
-  Rewilding area
-  Private yard
-  Water
-  Informal path (unpaved)
-  Formal path (paved)



CURRENT



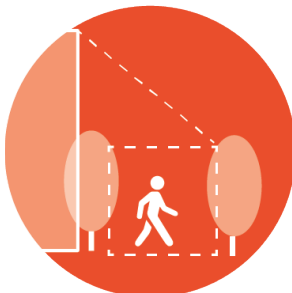
PROPOSED



Space Improvements



+ Interaction



+ Spatial complexity



+ Habitat diversity



Spatial intervention: Haaklaan

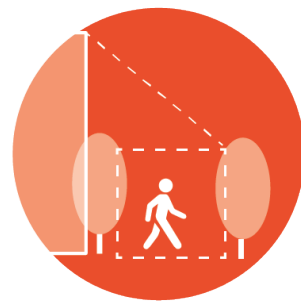


Spatial intervention: Kulkweg

Space Improvements



+ Interaction



+ Spatial complexity

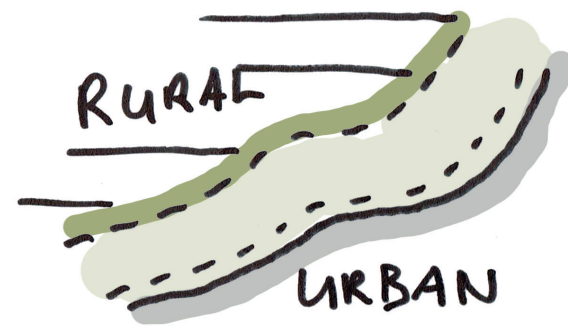


+ Habitat diversity

CONCLUSIONS

*“How can a nature based planning and design approach strengthen **biodiversity** and **sense of place** in Rotterdam's territories in-between ?”*

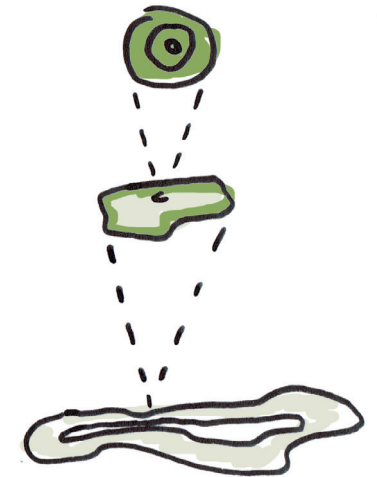
Design for the territory in-between should...



1. The urban fringe as distinct type of TiB



2. Strengthen existing spatial qualities of the TiB



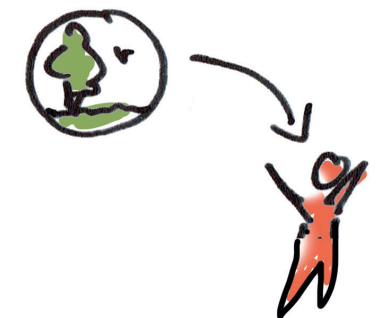
3. Integration and coherence between scales



4. Maximize human-nature interaction



5. Combination of short and long term interventions



6. Ecological design as a placemaking tool

TRANSFERABLE LESSONS

1. TiB located at the edges of the city have **unique social-ecological potential**.
2. TiB have **unique habitats** that differ from merely urban or rural environments.
3. **Greater ecological quality** generally leads to greater **sense of place**.
4. TiB with **greater social-ecological quality** are generally more spatially **heterogeneous**.
5. Improving **spatial quality** in the TiB is a matter of integrated **local and regional scale** developments.



FIGURES

Slide NR.

6
Grove snail from: www.lt.wikipedia.org/wiki/Cepaea_nemorali
Hedgehog from: <https://www.mijntuin.org/articles/egel>
Gatekeeper by: Plu, D from: www.natuurpunt.be/pagina/oranje-zandoogje
Common buzzard: Moorlag, H. from: www.ivn.nl/afdeling/hoogeveen/nieuws/natuur-op-zaterdag
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Grasshopper by: ANP, Dijl, van, M. from: <https://www.trouw.nl/nieuws/vreemde-kiezelprinkhaan-duikt-op-in-rotterdam>
Stone Marten by: Harskamp, van, H from: http://www.henkvanharskamp.nl/index.php/nggalerie/page/5?page_id=455
Bad from: [Pinterest.com](https://www.pinterest.com/originalsource/unknown), original source unknown.
Green woodpecker from: <https://waarnemingkaart.nl/kaart/?group=vogels&family=specchten&species=groene-specht>
Common toad by: Dijksterhuis, K from: www.trouw.nl/nieuws/waarom-we-padden-alleen-in-het-voorjaar-helpen-met-oversteken-bc0c1e7a/
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Viburnum, retrieved from: kruidenkast.com
Hedgehog, retrieved from: <https://www.mijntuin.org/articles/egel>

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Herbaceaus dike vegetation from: www.waternatuurlijk.nl
Willow trees from: www.route4you.com
Roadsie planting: [pinterest.org](https://www.pinterest.org/originalsource/unknown), original source unknown.
Natural waterway from: www.multifunctioneelelandbouw.net
Walking trail from: www.wandelnetwerknnoordholland.nl
Mountainbiktrail from: www.ridersguide.nl
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vriver bank, retrieved from: www.multituin.nl/natuurvriendelijke-oevers-in-landgoed-ockenburgh/
Bad retrieved from: [Pinterest.com](https://www.pinterest.com/originalsource/unknown), original source unknown.

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cyclingstreet, retrieved from: www.fietsberaad.nl
reed, retrieved from: www.fietswandelweb.nl
Rudd, retrieved from: www.ravon.nl

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Daycare farm from: www.flevopost.nl/artikel/1025061/dorpsboerderij-dronten-viert-feest
Allotmentgardens from: www.ijsse-landschap.nl/wonen_werken/volkstuinen/

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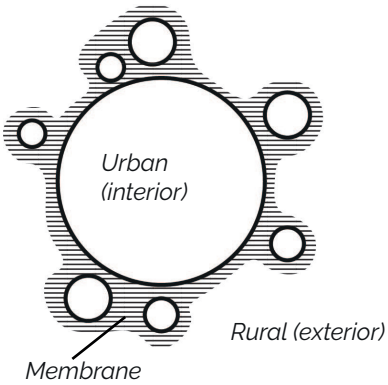
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Grey heron from: author unknown, *In De Weide: informatie weidevogels* retrieved from: <http://www.opavontuuropameland.nl/wp-content/uploads/2017/06/7-Weide-stap-3-informatie-weidevogels.pdf>
Grove snail from: Grove snail from: www.lt.wikipedia.org/wiki/Cepaea_nemorali
White wagthail: [Pinterest.com](https://www.pinterest.com/originalsource/unknown), original source unknown
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Bad: [Pinterest.com](https://www.pinterest.com/originalsource/unknown), original source unknown.
Barn swallow from: www.blijevogelswesterpark.nl
Common linnet: www.birdphoto.nl/vogels/Kneu
Rabbit from: www.shutterstock.com

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Houses, retrieved from: www.stedenbouwarchitectuur.nl
Farming animals, source unknown
Barnswallow, retrieved from: www.blijevogelswesterpark.nl

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Daycare farm, retrieved from: www.flevopost.nl/artikel/1025061/dorpsboerderij-dronten-viert-feest
Owl, retrieved from: www.natuurpunt.be
Fox from: [pinterest.com](https://www.pinterest.com/originalsource/unknown) original source unknown.

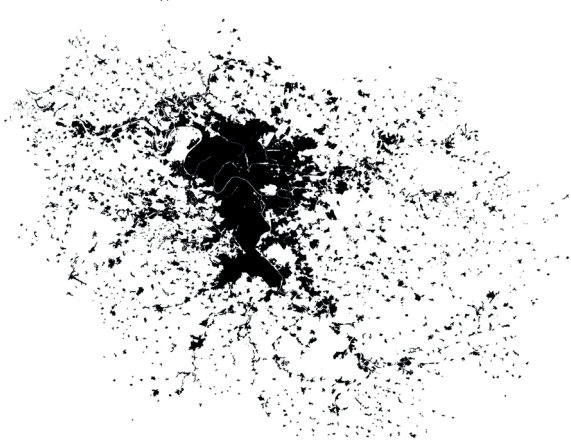
CONCEPTUAL

Concentric urban region



EXAMPLES

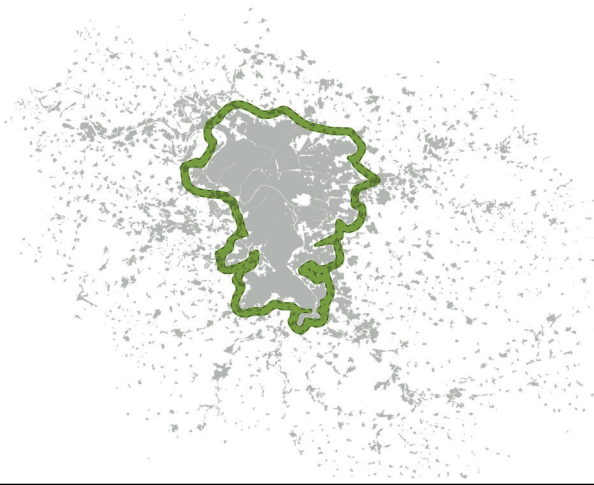
Paris, France



MEMBRANE

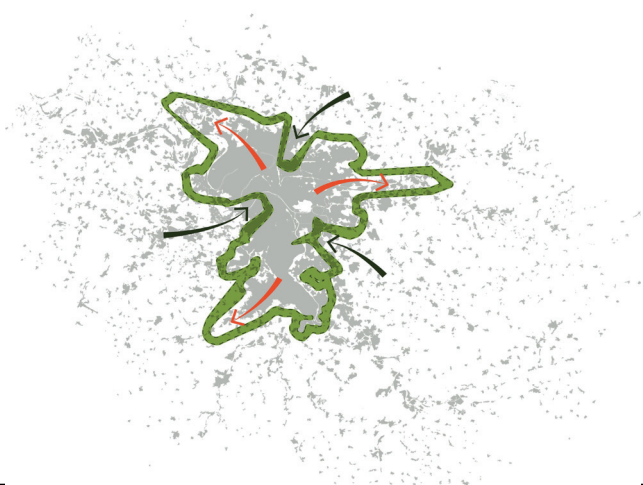
Single membrane

- 1.. Greater distance to membrane from urban core
- 2. Low total surface area of membrane in relation to urban area.

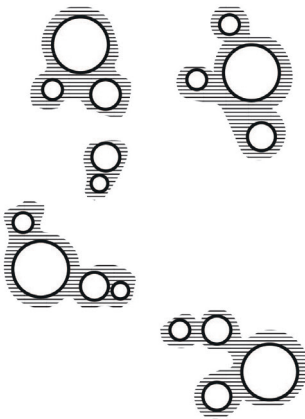


PROPOSED

Improve **accessibility of the membrane** and increase total membrane surface in relation to interior of the area (urban). By **increasing curvilinearity** of the urban border.



Polycentric urban region



Randstad, Netherlands



Membrane network

- 1. Great total membrane surface area in relation to urban area.
- 2. Small distance from urban core to membrane



Improve **inter-connectivity between membranes** at regional scale by creation of a macro membrane that also functions as a buffer for **protection of the interior** (rural) environment.

