

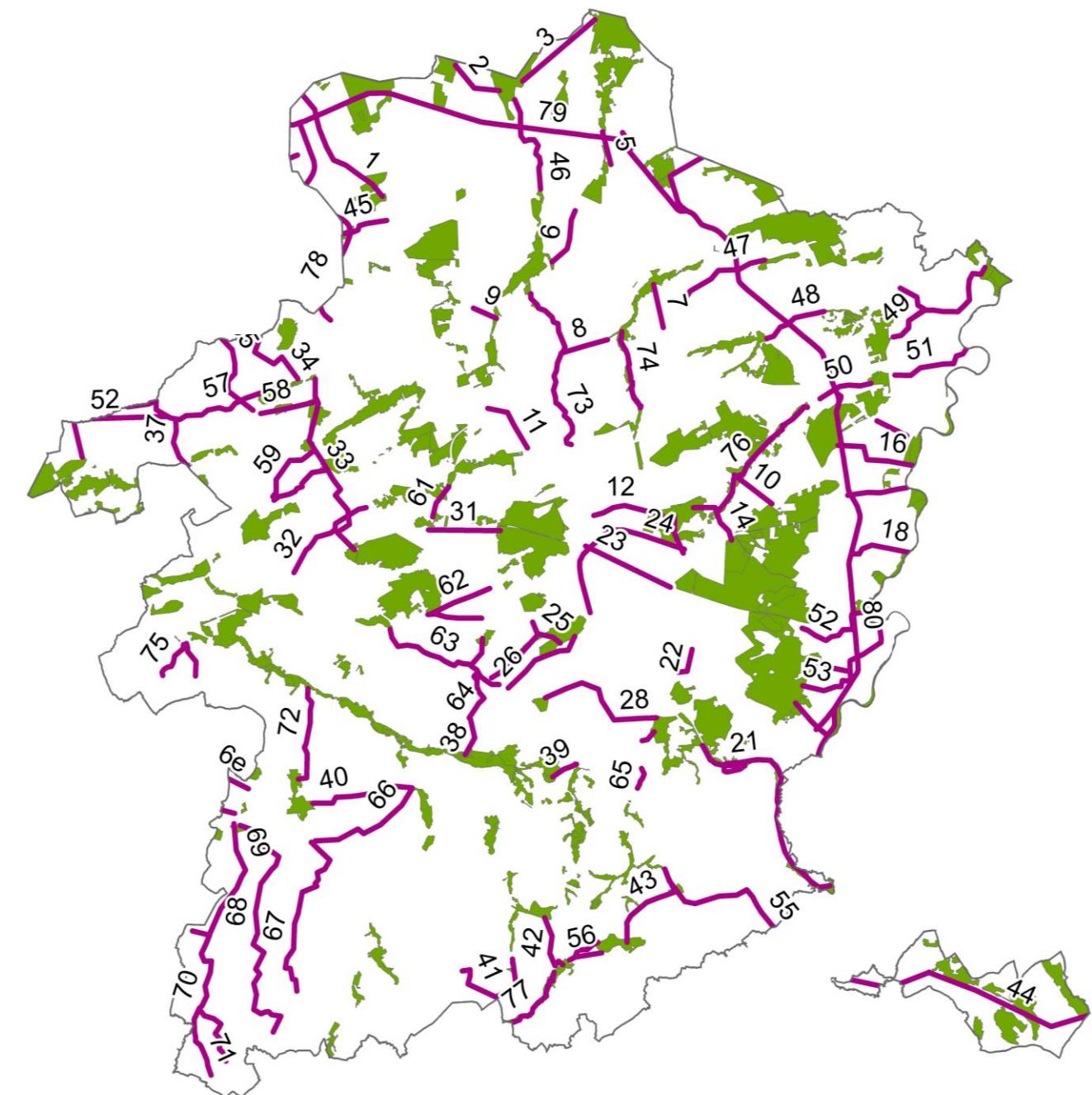


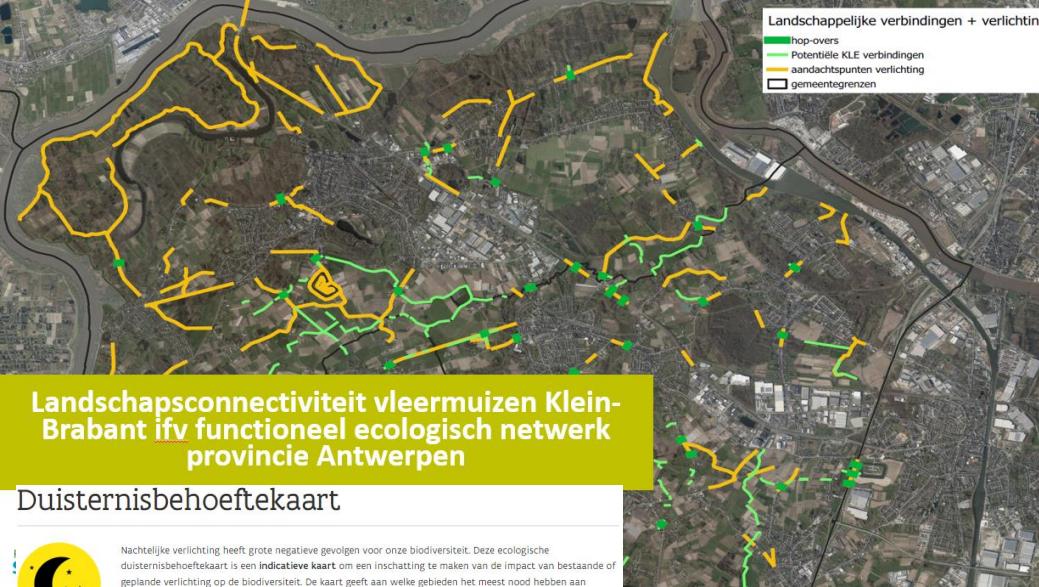
Towards functional ecological corridors

06/11/2024

Legal base:

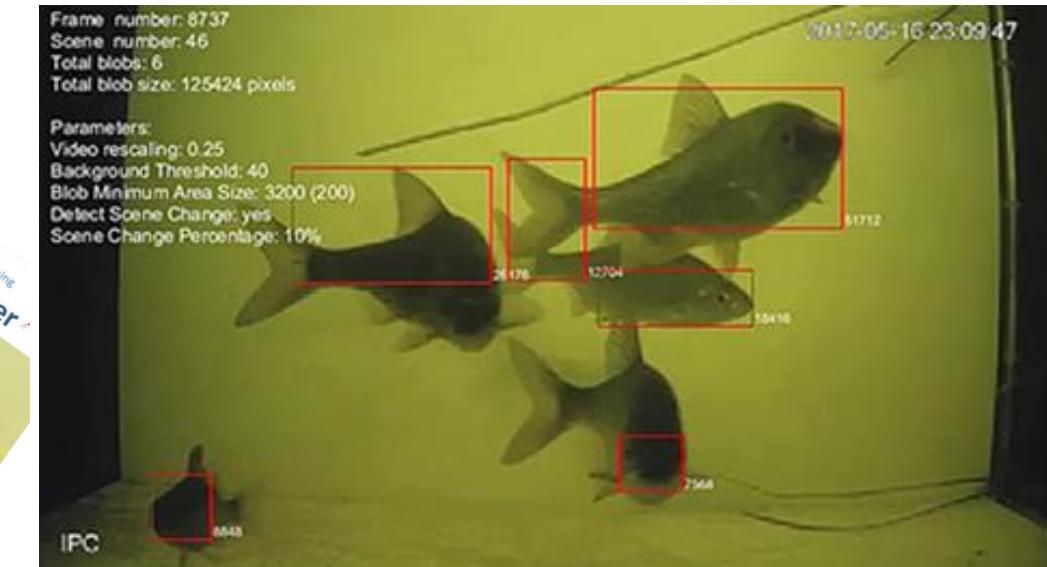
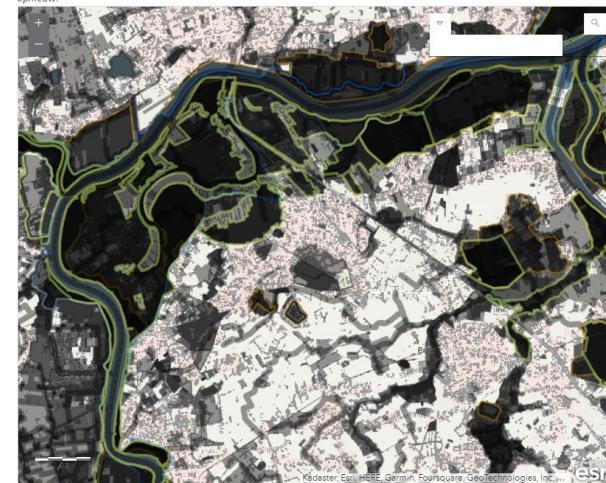
1997 nature decree: nature connection areas in the integral interweaving and supporting network (IVON) (Vlaams Ecologisch Netwerk VEN)





Interactieve kaart

Gebruik de zoekfunctie rechtsboven in de kaart.
Opgelet: als veel personen de kaart tegelijk willen bekijken, kan het even duren voor ze volledig geladen is. Probeer in dat geval later opnieuw.



Ecoprofile = speciesgroup + habitat

Open landschap		Halfopen landschap		Grotendeels gesloten landschap	
Grasland			Stromend water		
17. Dieren van grote riviervalleien					
 bever  otter  ooievaar  grote modderkruiper  rivierrombout  bruine korenbout					
18. Dieren van zuivere beken					
 beekprik  rivierdonderpad  kleine modderkruiper  bermpje  kopvoorn  riviergrondel  serpeling  beekrombout  weidebeekjuffer  bosbeekjuffer  ijsvogel  waterspitsmuis					

Betekenis symbolen soortennamen

-  Habitrichtlijnsoort Bijlage II en IV
-  Vogelrichtlijnsoort Bijlage I
-  Overwinteraar/doortrekker in belangrijk aantal
-  Zowel vogelrichtlijnsoort Bijlage I als overwinteraar/doortrekker in belangrijk aantal
-  Soort van hoogste Vlaamse prioriteit
-  Habitattypische faunasoort
-  Zowel soort van hoogste Vlaamse prioriteit als habitattypische faunasoort



Ecoprofile 16: animals of nutrient-poor fens, ponds and pools

**INBO
INFR**

habitrichtlijn	heikikker
habitrichtlijn	poelkikker
habitrichtlijn	rugstreeppad
Vlaams prioritair, habitattypisch	maanwaterjuffer
Vlaams prioritair, habitattypisch	speerwaterjuffer
habitattypisch	noordse witsnuitlibel
habitattypisch	venglazenmaker
habitattypisch	venwitsnuitlibel
Vlaams prioritair	hoogveenglanslibel
Vlaams prioritair	gerande oeverspin

Ecoprofile 16: animals of nutrient-poor fens, ponds and pools

habitrichtlijn	heikikker	heikikker
habitrichtlijn	poelkikker	poelkikker
habitrichtlijn	rugstreeppad	rugstreeppad
Vlaams prioritair, habitattypisch	maanwaterjuffer	
Vlaams prioritair, habitattypisch	speerwaterjuffer	
habitattypisch	noordse witsnuitlibel	noordse witsnuitlibel
habitattypisch	venglazenmaker	
habitattypisch	venwitsnuitlibel	venwitsnuitlibel
Vlaams prioritair	hoogveenglanslibel	hoogveenglanslibel
Vlaams prioritair	gerande oeverspin	
		koraaljuffer
		zwarte heidelibel

PPS

Potentiële natuurverbindingen

ecoprofiel

1 Dieren van grote akkercomplexen

4 Dieren van structuurrijke graslanden in een kleinschalig landschap

5 Dieren van natte, structuurrijke graslanden, ruigtes en grote zeggen

7 Vlinders en sprinkhanen van schraal grasland

6 Dieren van grote heide-dui-graslandcomplexen

8 Vlinders en sprinkhanen van structuurrijke heiden

9 Vogels van voedselarme bos-heide-complexen

16 Dieren van voedselarme vennen, vijvers en poelen

10 Dieren van lichtrijke bossen en mozaïeklandschappen

11 Dieren van structuurrijke, gesloten bossen

13 Dieren van vegetatierijke plassen

14 Moerasvogels

15 Dieren van poelen

14 Moerasvogels

17 Dieren van grote riviervalleien

18 Dieren van zuivere beken

47 soorten

Veldleeuwerik, grauwe gors, geelgors,
grauwe klauwier, moerassprinkhaan,
zeggekorfslak,
veldparelmoervlinder,...

39 soorten

Gladde slang, levendbarende hagedis,
nachtzwaluw, boomleeuwerik,
heivlinder, heikikker, poelkikker,
rugstreeppad,...

57 soorten

Middelste bonte specht, glanskop,
das, hazelmuis, eikelmuis, vliegend
hert, nachtegaal, kleine ijsvogelvlinder,
gekraagde roodstaart,...

40 soorten

Variabele waterjuffer, boomkikker,
kamsalamander, vroedmeesterpad,
roerdomp,...

39 soorten

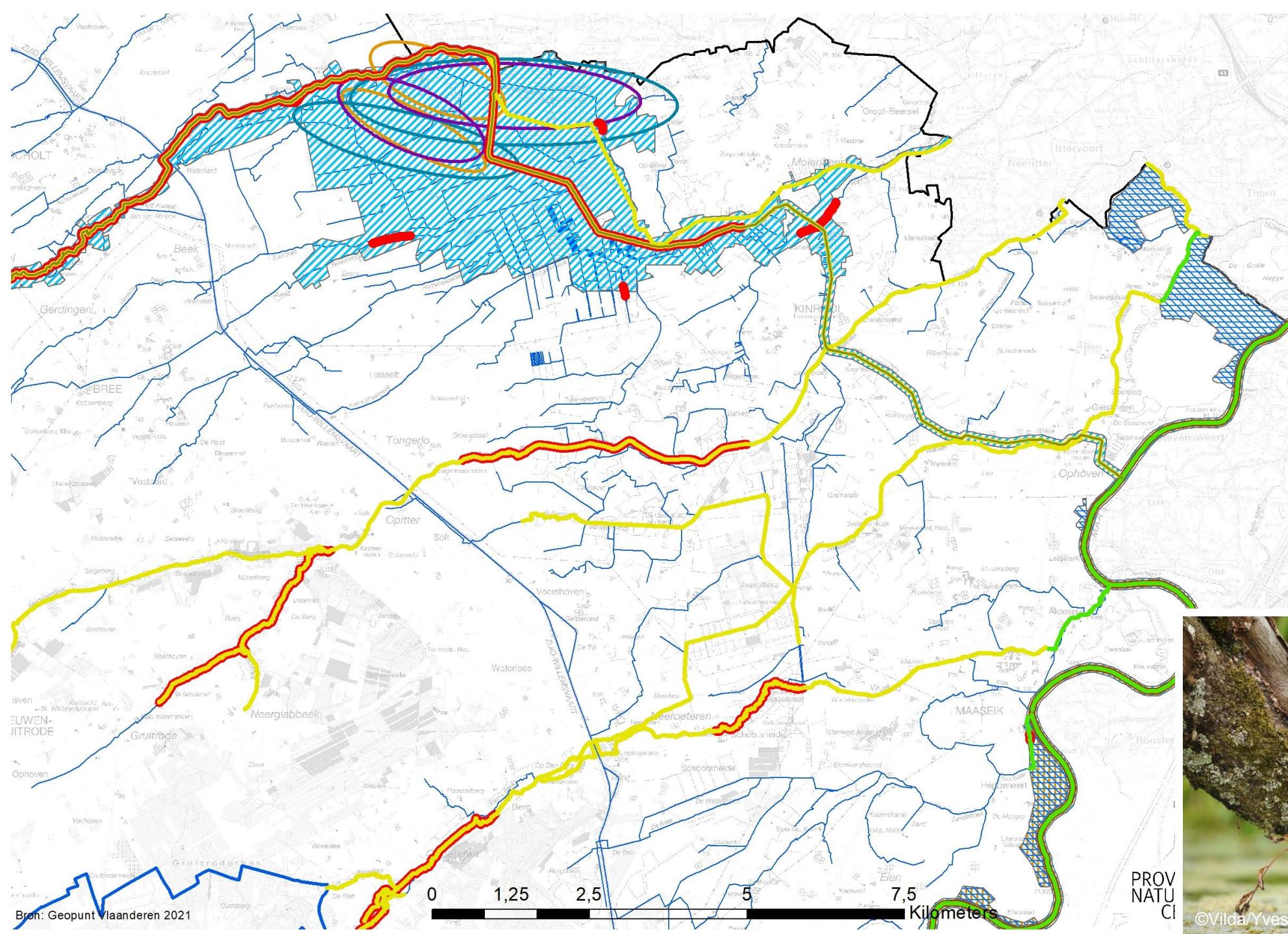
Otter, rivierrombout, beekprik,
bosbeekjuffer,...

3 datalagen in een kaartoefening:

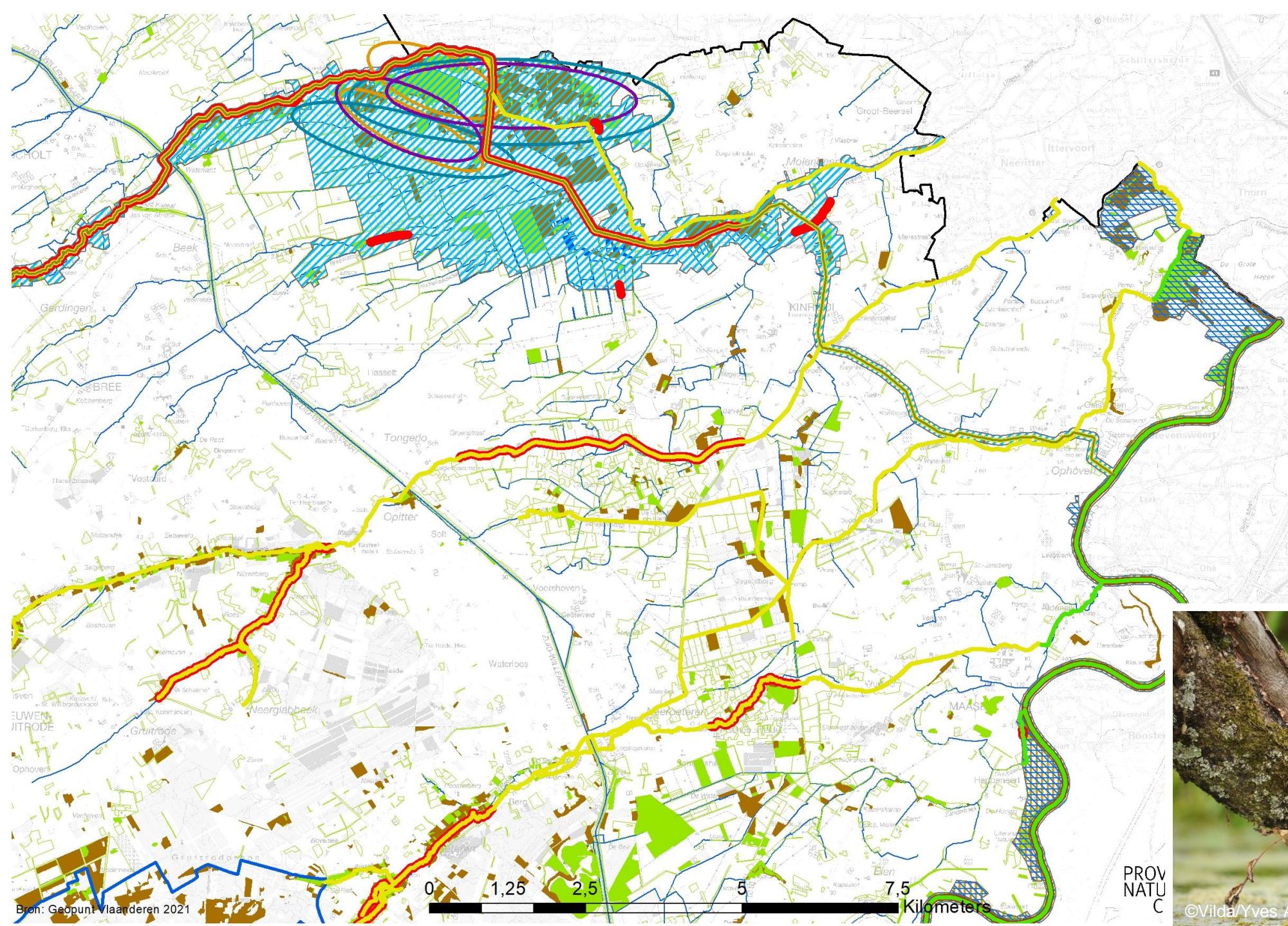
- policy goals (IHD en SBP)
- used vegetationtypes (BWK)
- observations of species
(waarnemingen.be, likona-databank)



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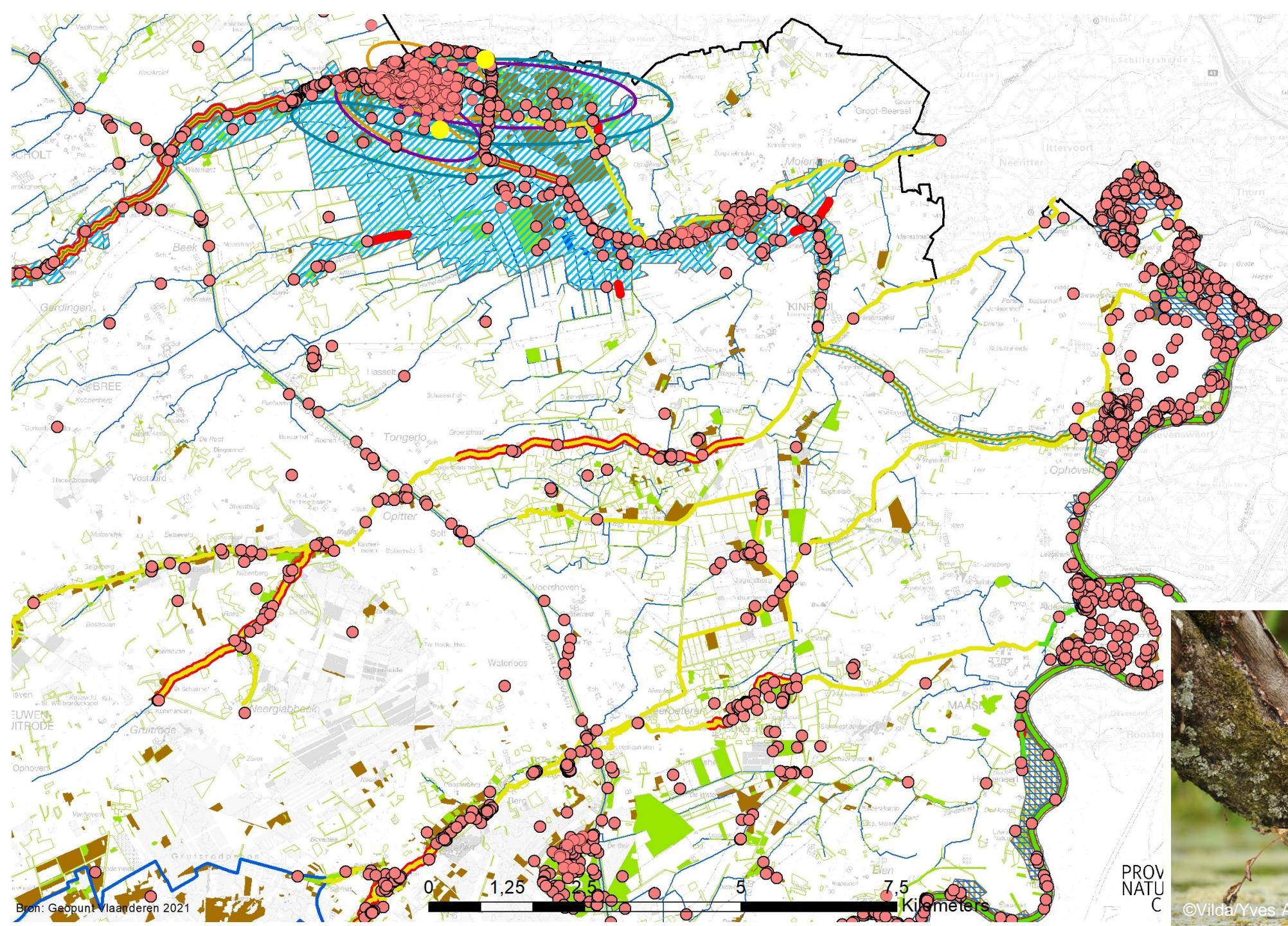
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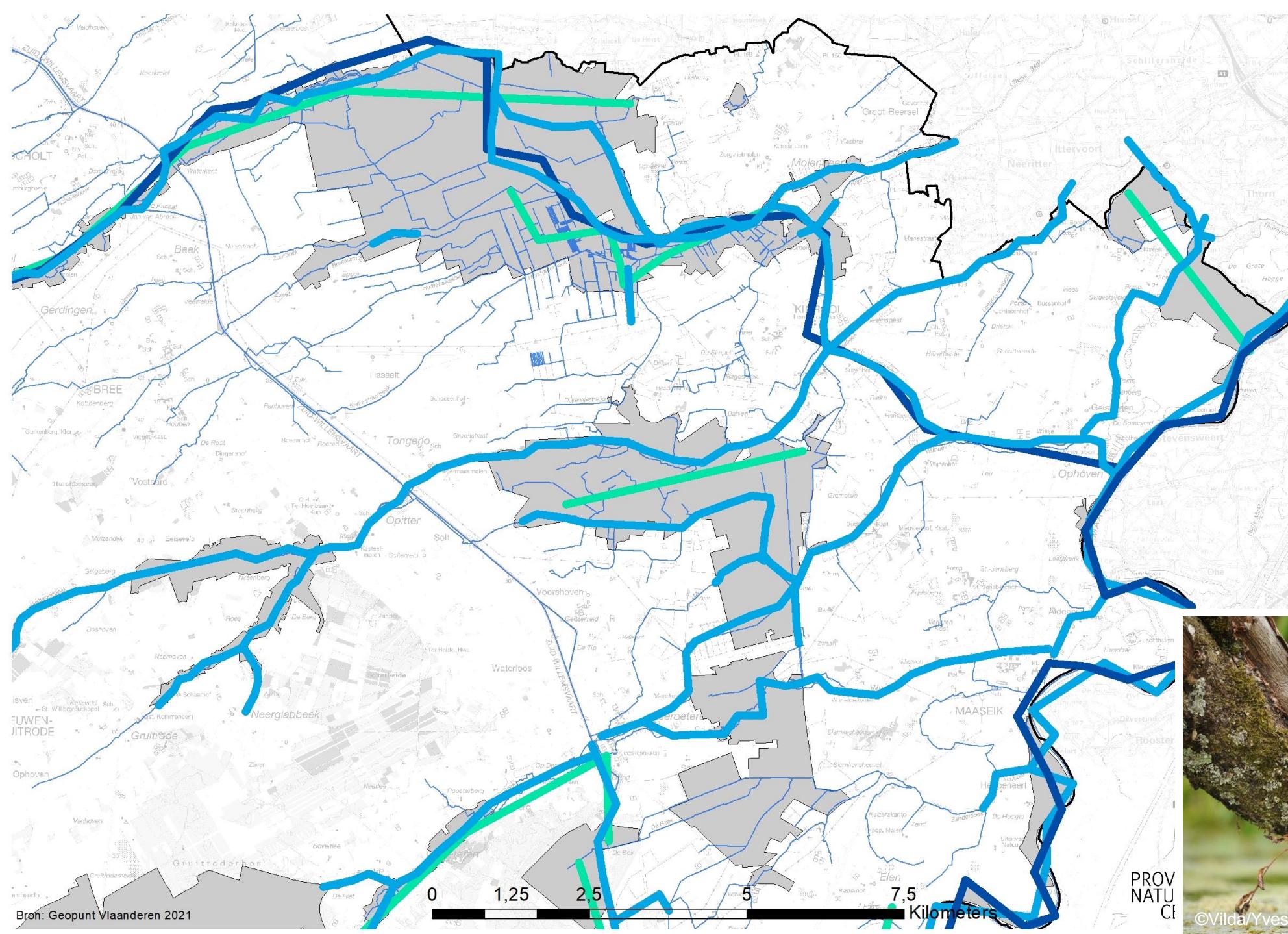


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Natuur verbinden

Ons landschap is versnipperd. Dat maakt overleven moeilijk voor veel dieren en planten.

Een oplossing? De grotere natuurgebieden met elkaar verbinden.

Natuurverbindingen in onze kennisbank

Wil jij ook werk maken van een natuurverbindingenproject? Of wil je gewoon meer weten over het thema? Bekijk dan zeker deze kennisdокументen:

- › [Gemeentelijke natuurverbindingenrapporten](#)

Rapporten die de natuurverbindingenkansen per gemeente in kaart brengen

- › ["Limburgse fauna en flora verbinden. Een goede zaak voor mens en natuur"](#)



GIS-tool Limburgse Natuurverbindingen

<https://www.provinciaalnatuurcentrum.be/themas/natuurverbindingen>

Legenda

Natuurverbindingenkansen per thema en ecoprofiel (EP)

Akker & grasland

- EP01 - Dieren van grote akkercomplexen
- EP04 - Dieren van structuurrijke graslanden in een kleinschalig landschap
- EP05 - Dieren van natte, structuurrijke graslanden, ruigtes en grote zeggen
- EP07 - Vlinders en sprinkhanen van schraal grasland

Heide

- EP06 - Dieren van grote heide-duin-graslandcomplexen
- EP08 - Vlinders en sprinkhanen van structuurrijke heide
- EP09 - Vogels van voedselarme bos-heide-complexen
- EP16 - Dieren van voedselarme vennen, vijvers en poelen

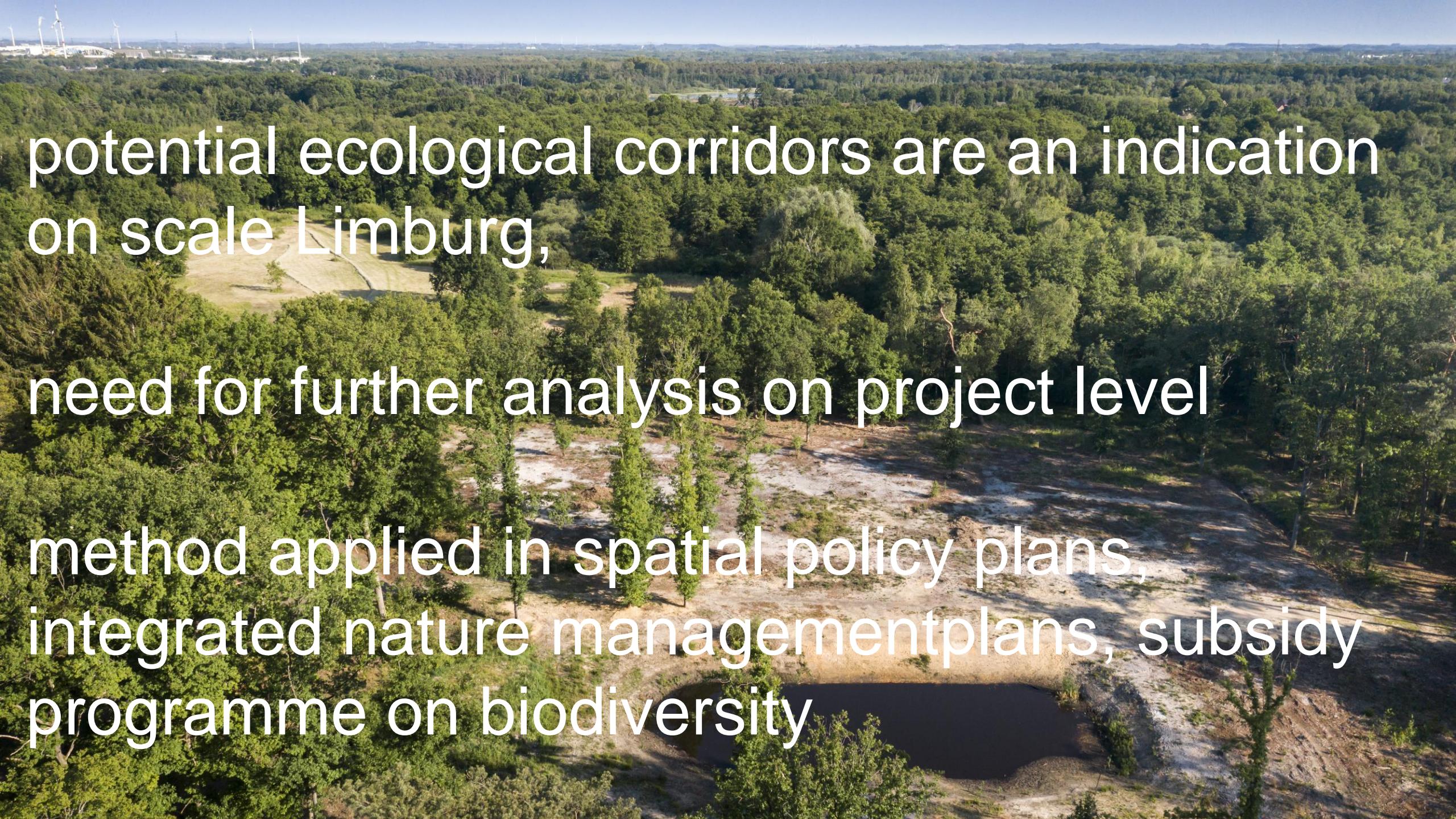
Bos

- EP10 - Dieren van lichtrijke bossen en mozaïeklandschappen
- EP11 - Dieren van structuurrijke,

The map illustrates the distribution of nature connectivity opportunities across the border region between the Netherlands and Belgium. The network of lines, color-coded by ecological profile (EP), shows the potential for habitat connectivity for various species. Key areas highlighted include the National Park de Meinweg in the Netherlands and the surrounding forested and agricultural landscapes.

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Craenevenne 86, 3600 Genk
www.pnc.be - facebook.com/ProvinciaalNatuurcentrum
011 26 54 50 - pnc@limburg.be

The background image is an aerial photograph of a lush green forest. A dirt path or clearing cuts through the trees on the left side. In the distance, there's a small, dark body of water and some industrial structures with wind turbines. The sky is clear and blue.

potential ecological corridors are an indication
on scale Limburg,

need for further analysis on project level

method applied in spatial policy plans,
integrated nature managementplans, subsidy
programme on biodiversity

An aerial photograph of a landscape dominated by dense green forests. A winding, light-colored path or clearing cuts through the trees in the upper left. In the lower right, there is a large, irregularly shaped clearing with sparse vegetation and some exposed soil. The horizon shows a distant industrial area with buildings and wind turbines.

is based largely on actual nature values in the landscape

maps are a basis for consulting with neighbouring partners

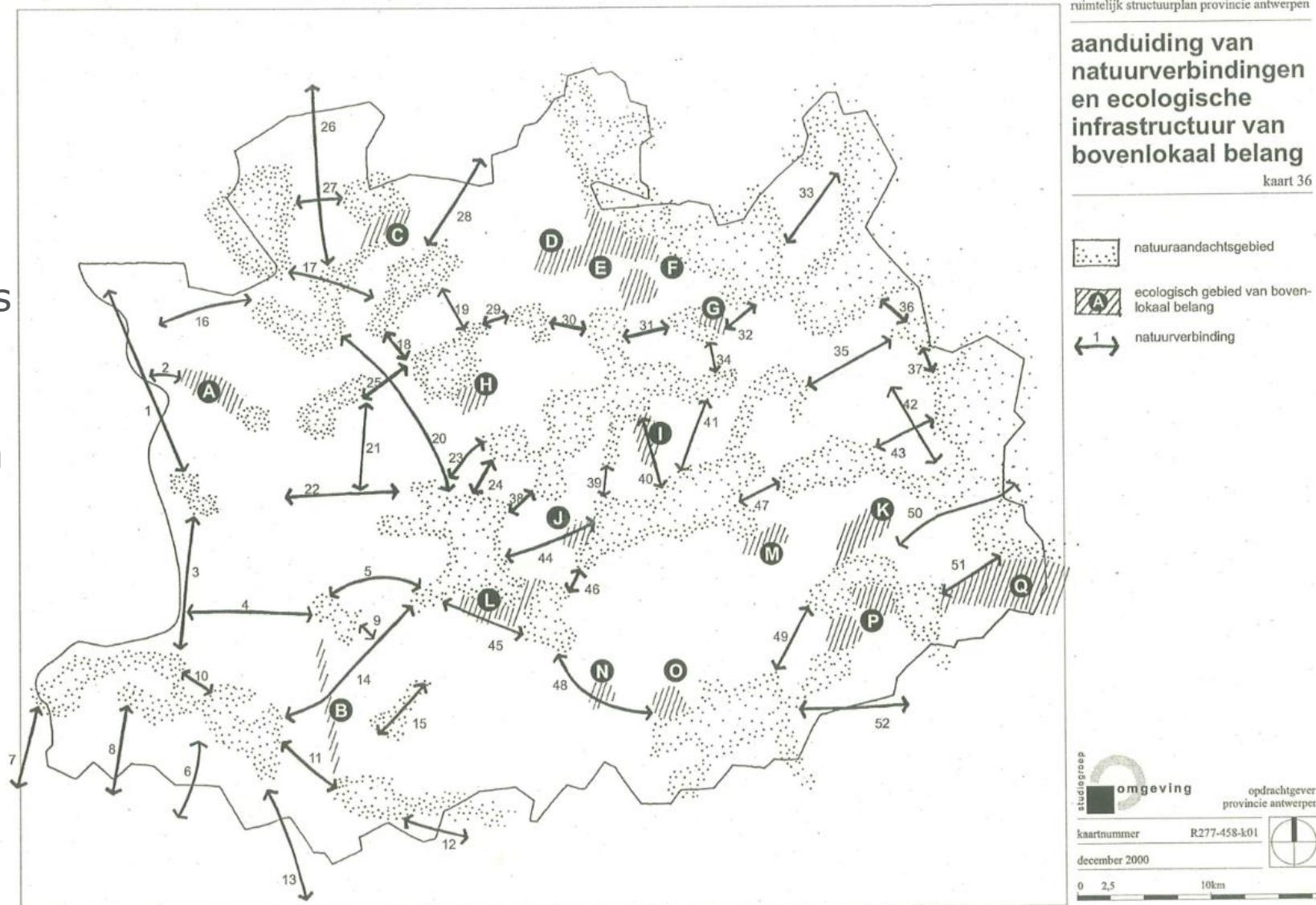
Functional Ecological Network (FEN) province of Antwerp

Interregional working group 'Connectivity in Belgium'
6/11/2024

Rembrandt De Vlaeminck – Province of Antwerp

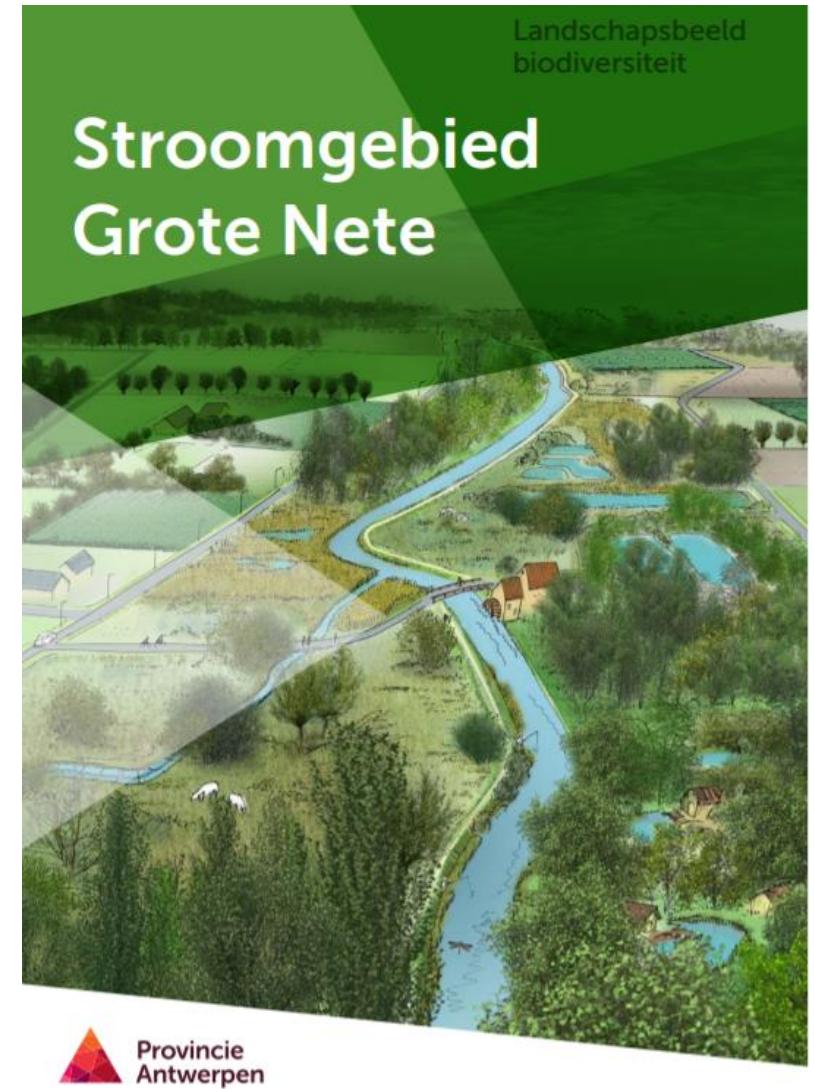
Where it started - 2001 Provincial spatial planning policy

- Connecting nature core areas as a task for provincial governments in the 1997 Flemish Nature decree
- + representation of core areas and connections
- - Very abstract representation
- - Not easily reproducible and updatable
- - No info on target species

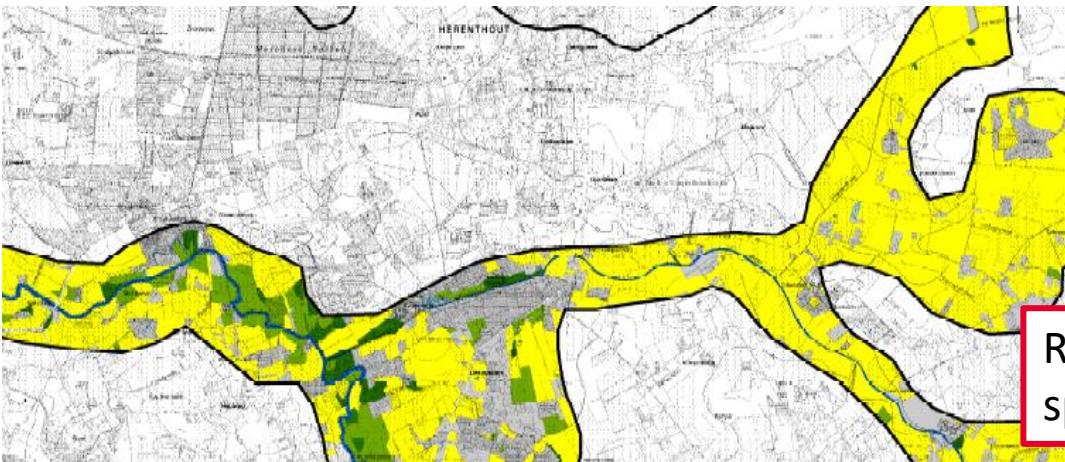


2013 Landscape images for biodiversity

- Supporting tool for nature connectivity actions
- Visualisation of desired landscape for provincial subregions
- Primary landscape components, relevant species, ecoprofiles and actions



2013 Landscape images for biodiversity



Relevant species

Primary landscape component

Wet forest and shrubland

Semi-open agricultural land

Nutrient rich ponds and marshes

Damp and wet grasslands

Watercourses

Species ecoprofile(s) and actions

Example: Wet forest and shrubland

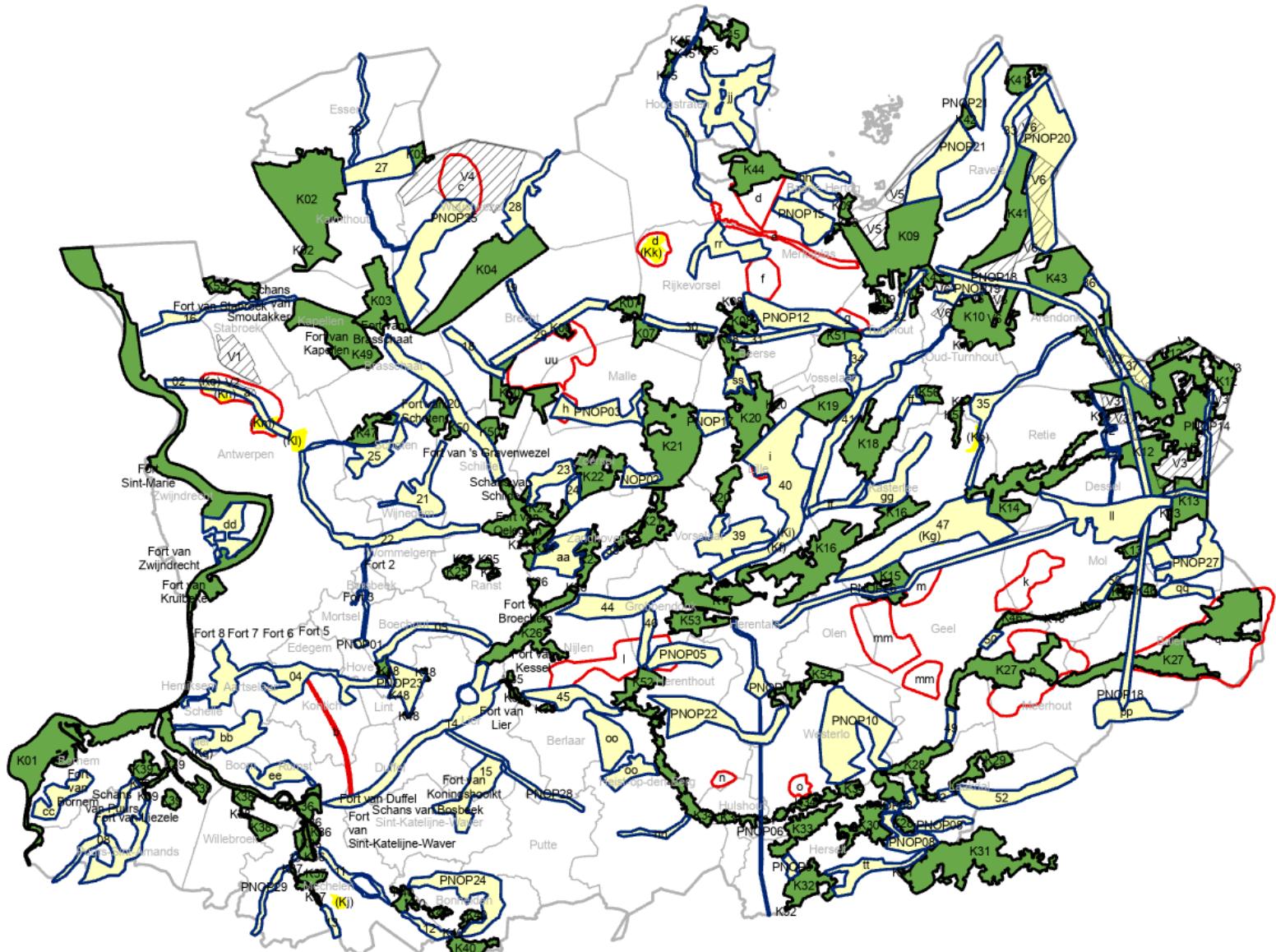
Inbreng inheemse soorten	Ontwikkeling van bosranden	Natuurgericht bosbeheer	Behoud van ecologisch waardevolle bomen
Behoud van dood hout	Ecologisch duurzame bosexploitatie	Beheer van opgaande bomenrijen en drenen	Verwijderen van exoten
Verhogen waterpeil	Ontwikkeling van open plekken	Omvorming van populierenaanplantingen	

- + GIS-data on landscape components
- + info on target species and relevant actions
- - no selection of core areas and connections for prioritizing



Preparation for 2024 spatial planning policy

- + More spatially explicit representation of core areas and connections
- + Used for prioritizing funding of connectivity-actions
Regional Landscape Organisations and Forest Associations
- - Not easily reproducible and updatable
- - No info on target species
- => need for an improved methodology for mapping Functional Ecological Network



Least Cost Path analysis

STEPS

- Defining **nature core areas on landscape level** and **core areas for each ecoprofile group** within these nature core areas
- Mapping **resistance** in a 10x10m raster
 - Land use map and Biological value map (vegetation)
- Defining **barriers**
 - Highways except crossings of ecoducts and large watercourses
- Calculation of leasts cost path + buffer based on accumulated resistance: **search areas for connections**

***A buffer outside provincial borders was used for detecting connections towards the Netherlands and other provinces**

Species group oriented approach

- Taking target species into account by using **ecoprofile groups with similar ecological preferences**
 - Heathlands (and associated vegetations)
 - Forests
 - Marshlands (and associated vegetations)
 - Structurally rich grasslands in small scale landscapes



Defining nature core areas on landscape level

Criteria

Flemish ecological network (VEN)

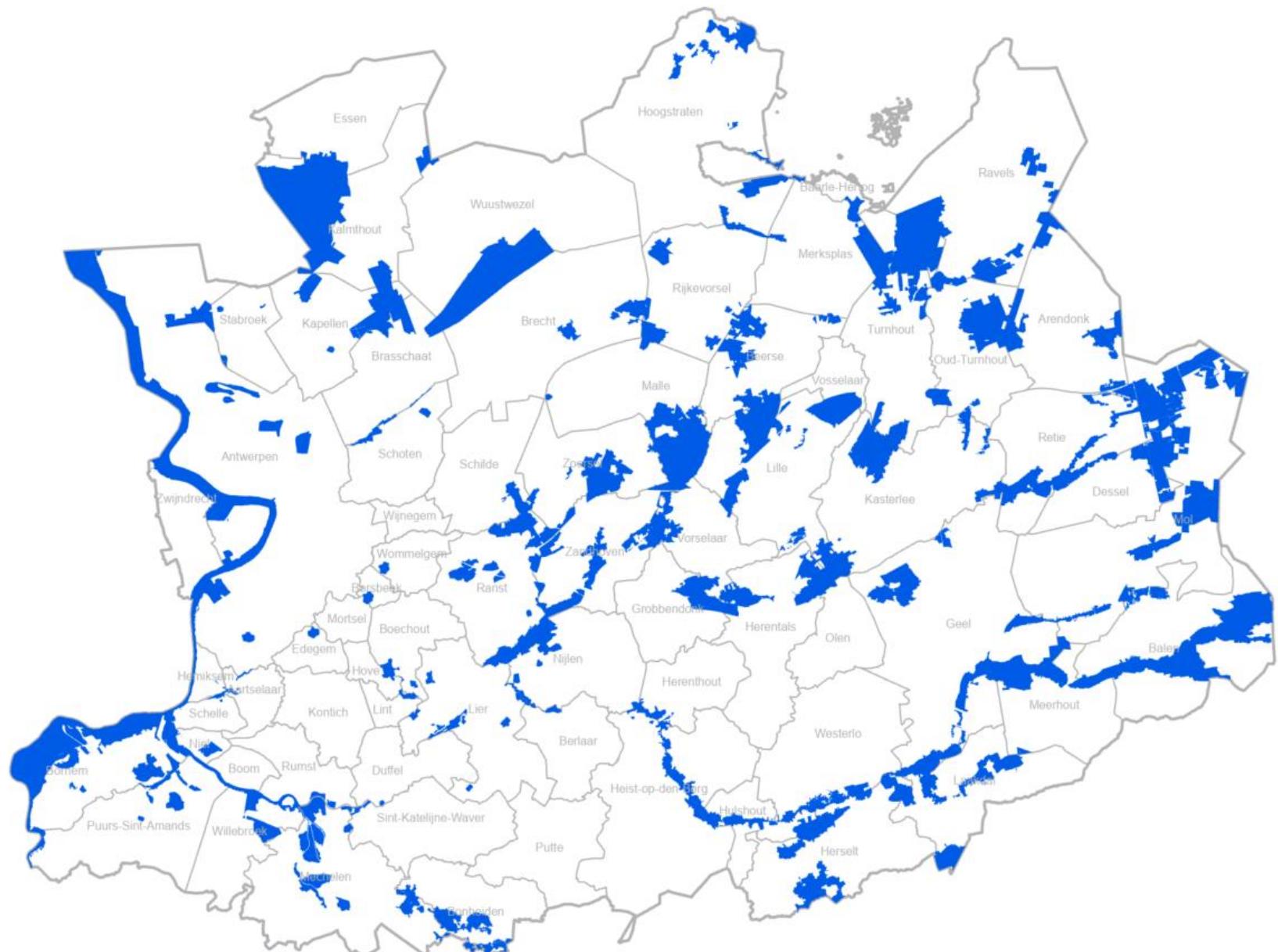
or

Natura 2000 Special Protection Areas

- Habitat
- Bird (selection)

and

Adjoining nature and forest reserves



Provincie
Antwerpen

Defining nature core areas on ecoprofile group level

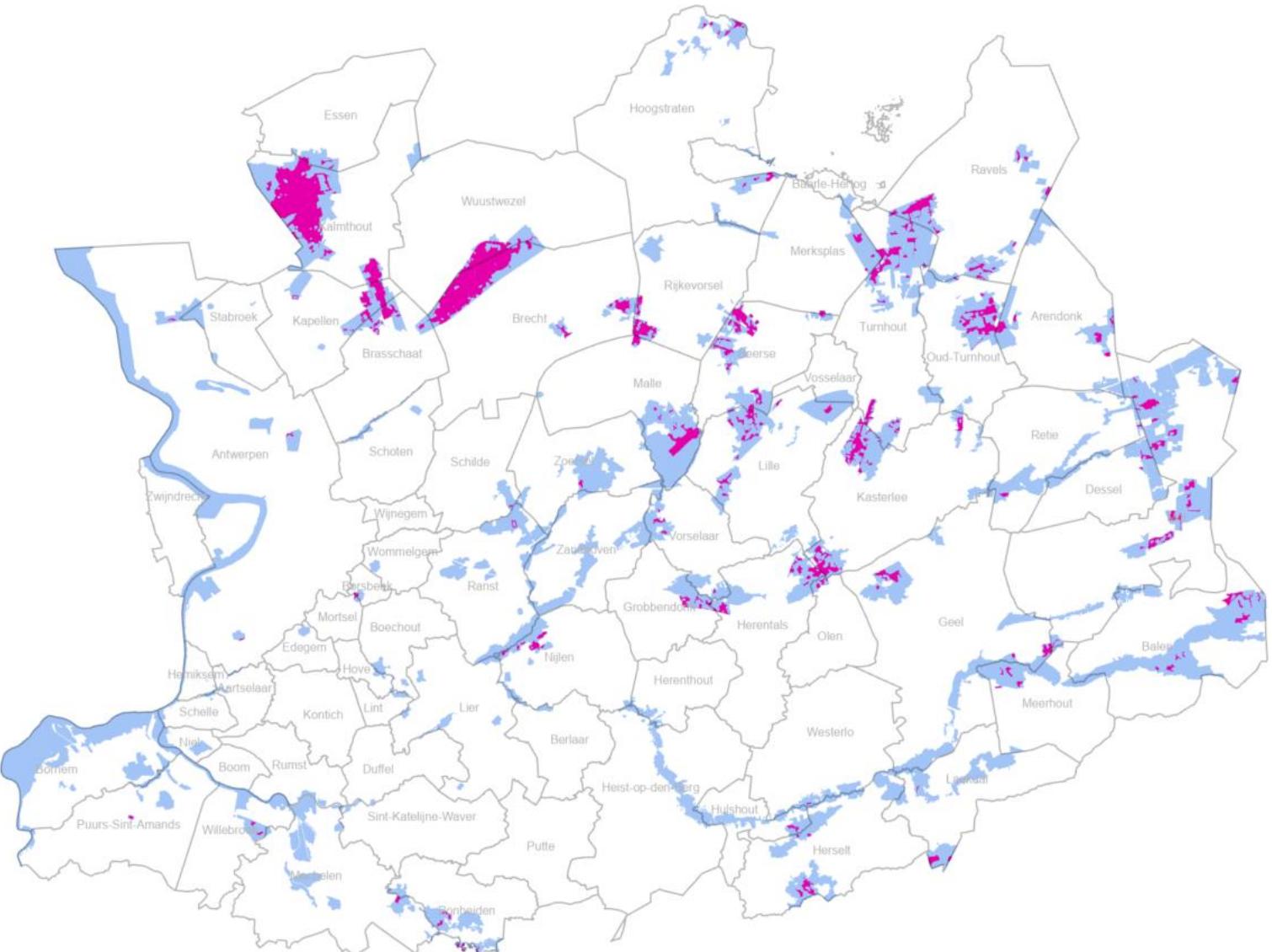
Criteria

Within nature core area

and

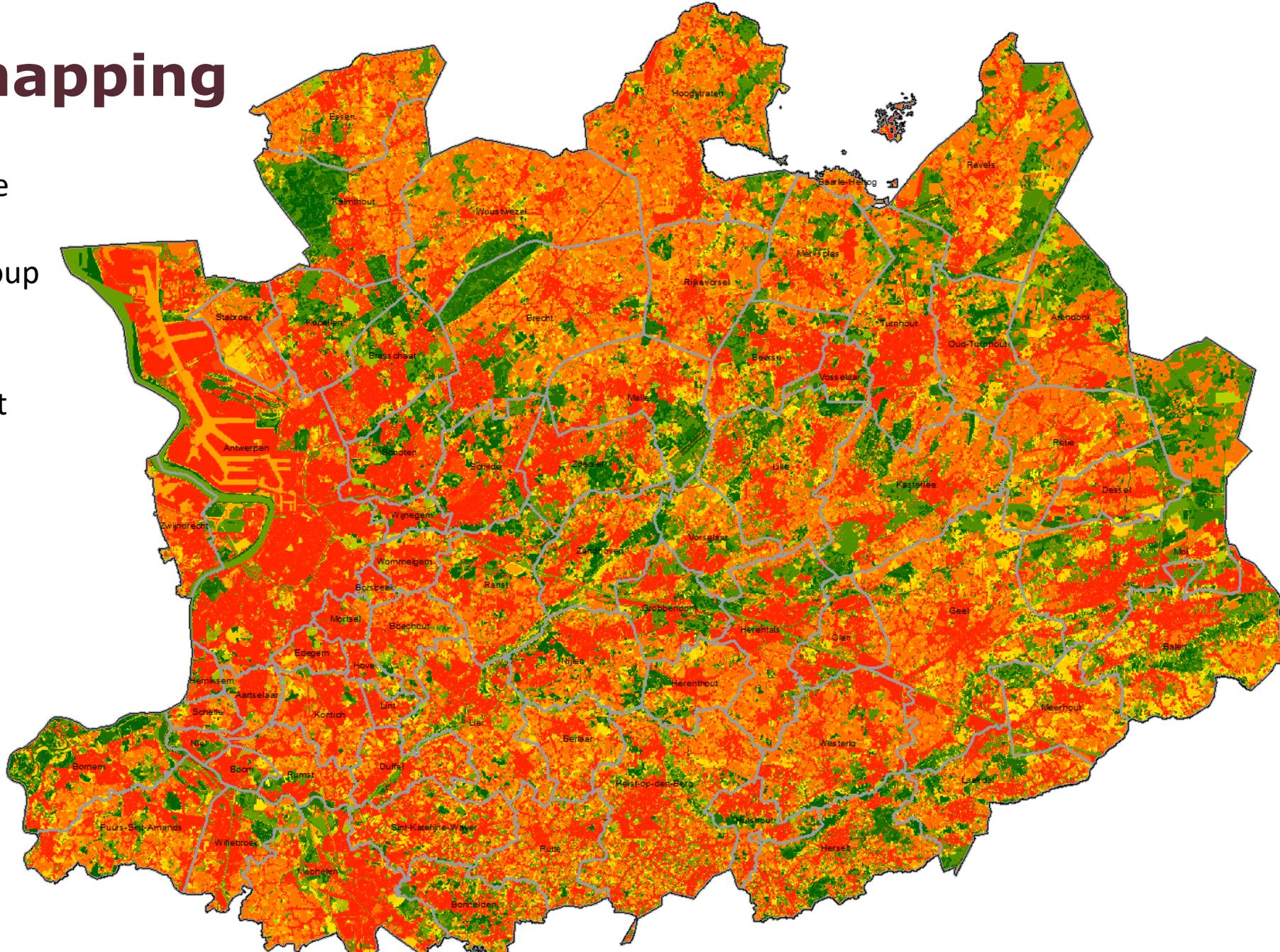
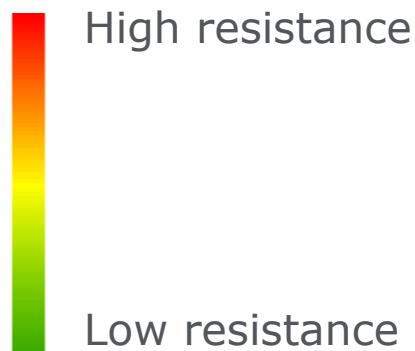
Selection of vegetation types +
minimal area

Example: heathland species



Resistance mapping

- Global resistance on landscape level
- 4 maps for each ecoprofile group
- Based on land use and vegetation (BWK)
- Combined with barrier dataset (highways) for LCP analysis



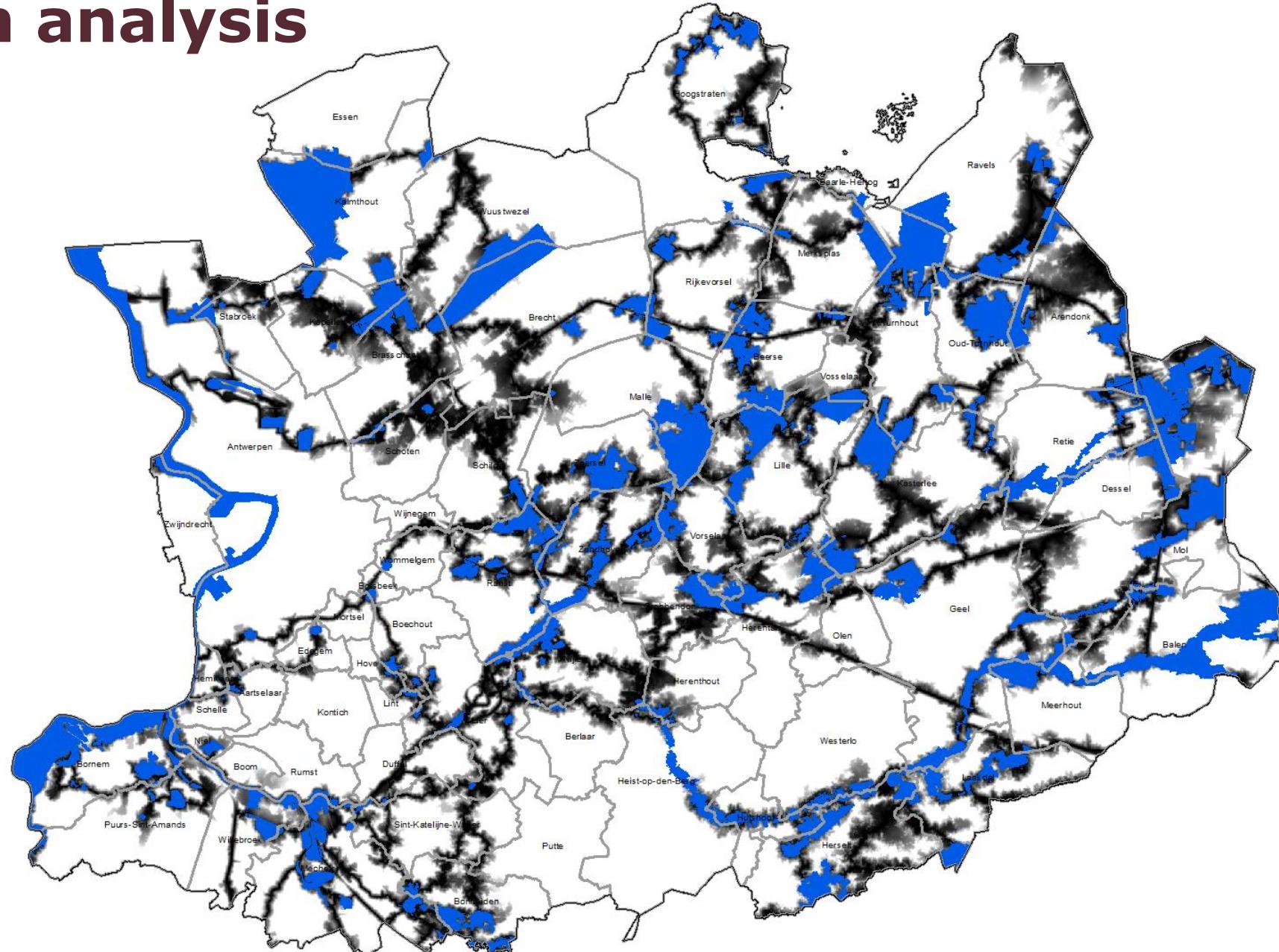
Least cost path analysis

Landscape level



Nature core area

Search zones for nature connections (resistance based buffer along least cost path)



Least cost path analysis

Ecoprofile group level



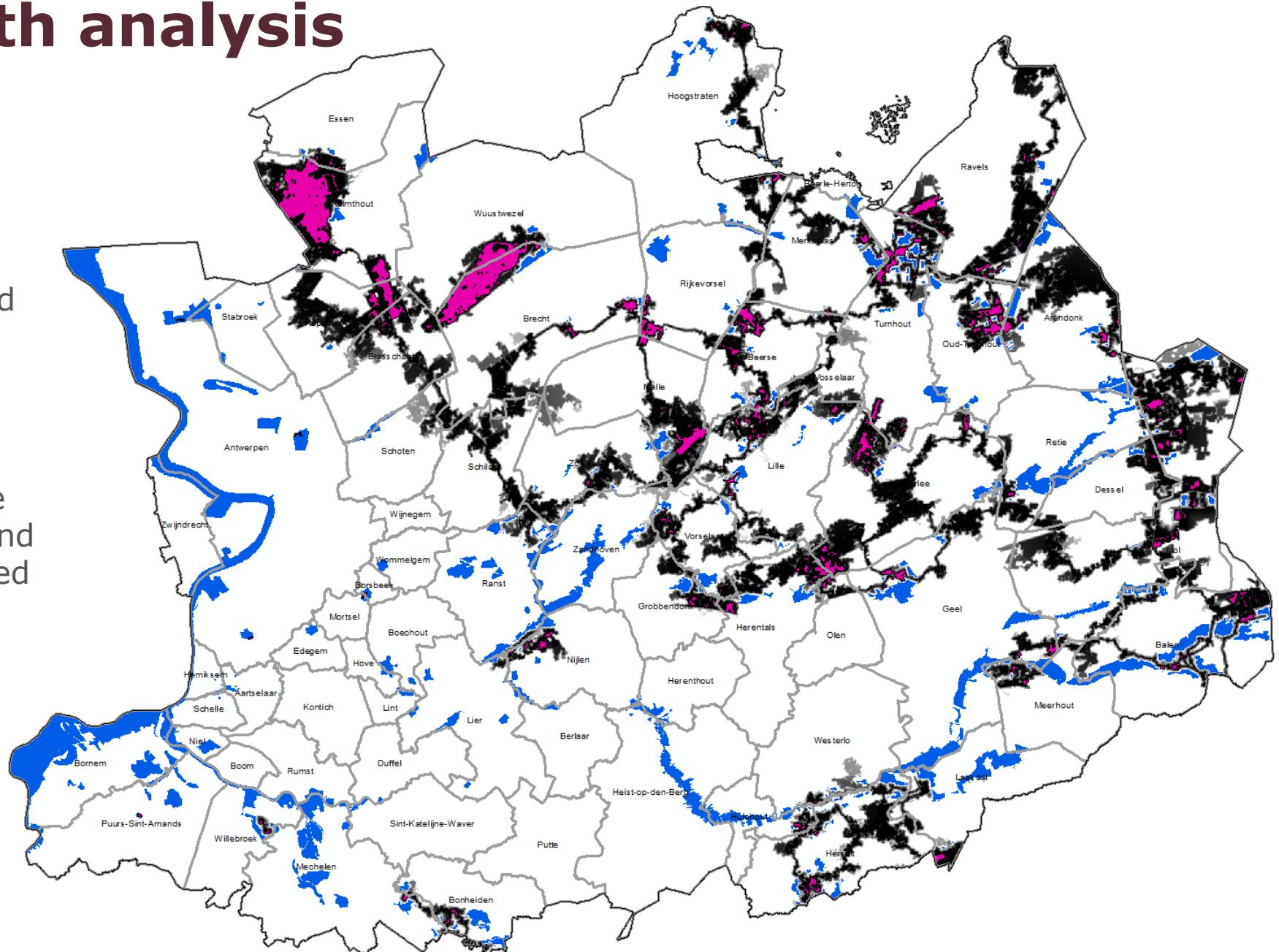
Core area for heathland species



Nature core area



Search zones for nature connections for heathland species (resistance based buffer along least cost path)



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Antwerpen

Practical application

Reference

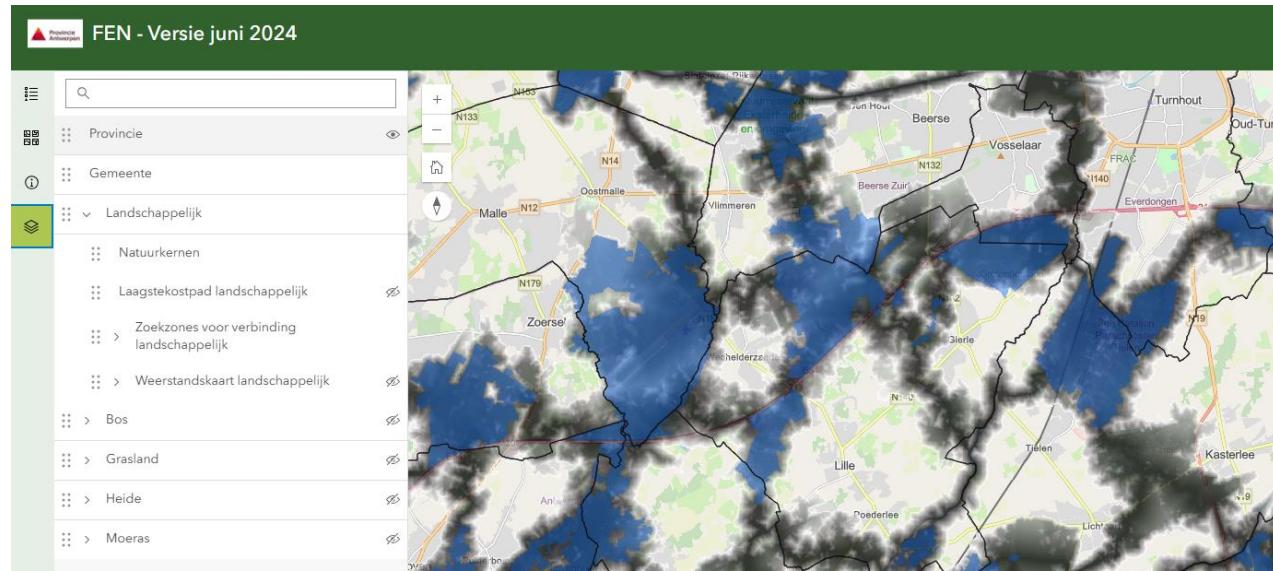
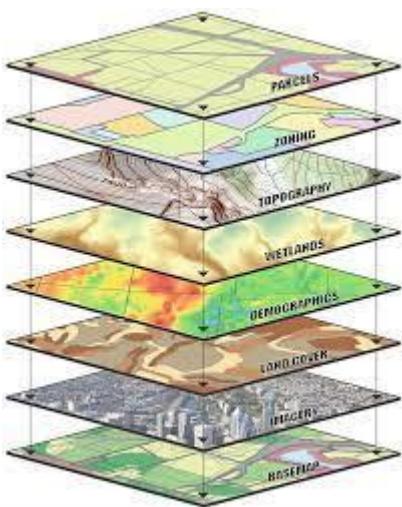
Funding
framework

Focus and
prioritizing



Reference library

Reference



- Providing info for knowledge based planning
- Map platform in browser and desktop GIS
 - Including other data: land ownership, spatial planning, land use, infrastructure, ecosystem services, species distribution data, habitats ...
- Website

Funding framework

Funding framework

- Funding implementation of actions by Regional Landscape Organisations and Forest Associations



FAN van FEN - Functioneel Ecologisch Netwerk

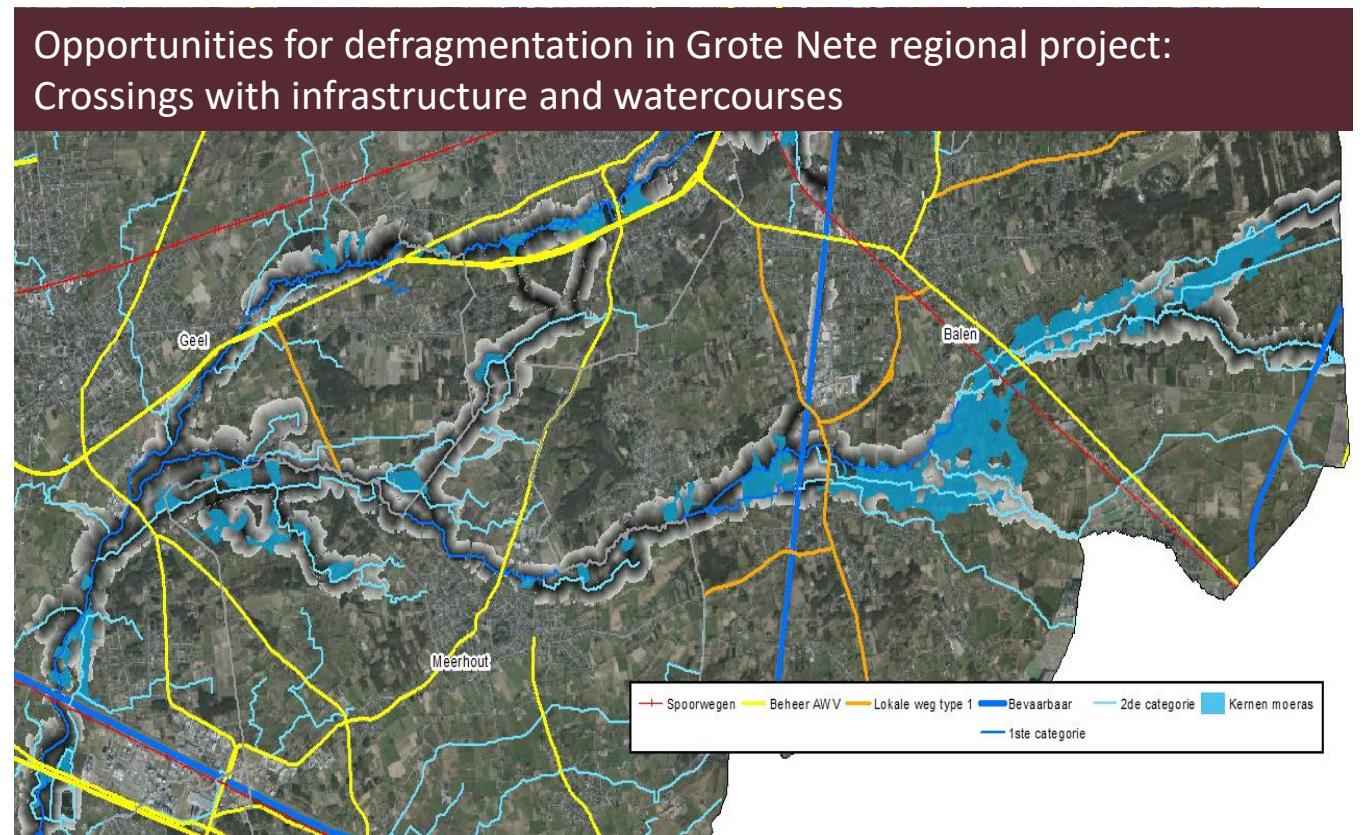
In samenwerking met de Regionale Landschappen en Bosgroepen



Focus and prioritizing

Focus and prioritizing

- Selection of most important areas
- Building partnerships
- Defining targets
- Allocating resources
- ...



Conclusions

- FEN-mapping initiatives are considered very valuable for better planning of connectivity measures and realizing targets of the European Nature restoration law
 - Colleagues, Flemish government, Local governments and organisations are eager to work with the results.
- Provinces can further improve by combining strengths of different approaches
 - First steps are being taken. East Flanders now also using LCP, interprovincial network on nature connectivity, ...
- GIS-data opens up opportunities for further analysis
 - Ecosystem services, synergies and trade-offs, detecting opportunities, bottlenecks and barriers, ...



Lots of opportunities ahead!