

Applications of the Natural Capital Approach in Planning and Development

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**Accounting for Natural
Capital – Beds LNP**



17th May 2018

The Natural Capital Agenda

- The natural capital concept is increasingly being recognised in the UK and globally, in both the public and private sectors
- Creation of the independent Natural Capital Committee
- UK Natural Capital accounts being developed by ONS and Defra
- A key component of post-Brexit agricultural policy
- A natural capital approach is central to the Government's 'A green future: Our 25-year plan to improve the environment' (2018)

The Natural Choice:
securing the value
of nature



Department
for Environment
Food & Rural Affairs

Health and Harmony: the
future for food, farming and
the environment in a Green
Brexit

February 2018

Natural capital and the development sector

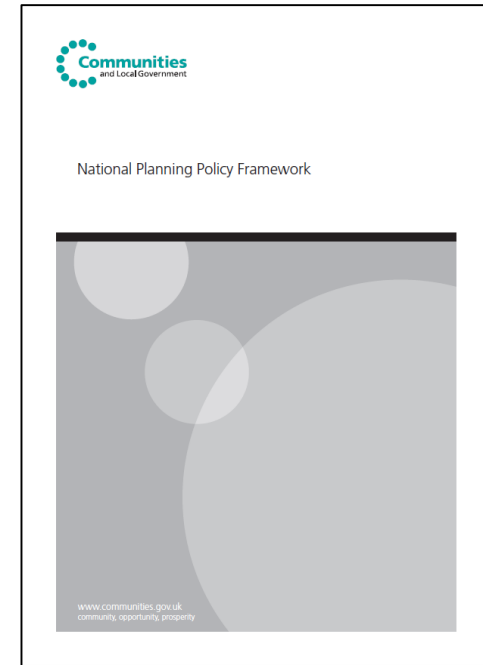
UK Government's National Planning Policy Framework (2012)

“The planning system should contribute to and enhance the natural and local environment by [...] recognising the wider benefits of ecosystem services”

UK Government's 25 year environment plan (2018)

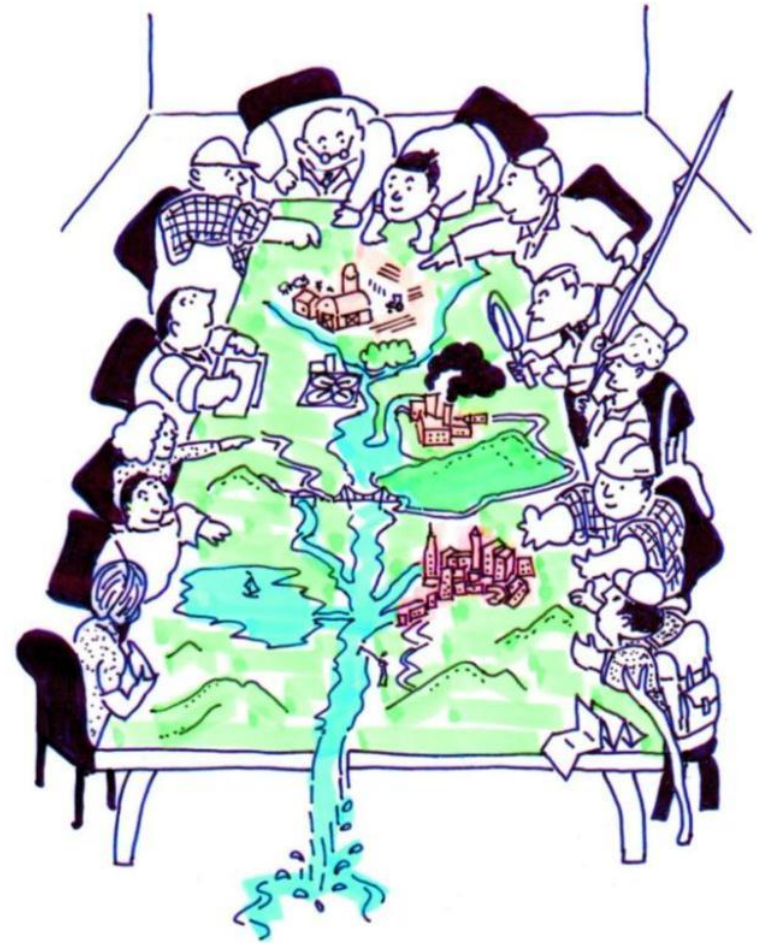
“Embedding an ‘environmental net gain’ principle for development, including housing and infrastructure”

“..expand the net gain approaches used for biodiversity to include wider natural capital benefits such as flood protection, recreation and improved water and air quality”



But how?

- There remains a big gap between policy and practice in applying the natural capital concept
- There is no standard way of applying natural capital in the planning and development sector (or other sectors)
- **How can the natural capital approach be applied in practice?**
- Applications at 2 scales:
 1. Habitat opportunity mapping across the landscape
 2. Natural capital impact assessment at a development site



Habitat opportunity mapping in Northamptonshire and Peterborough

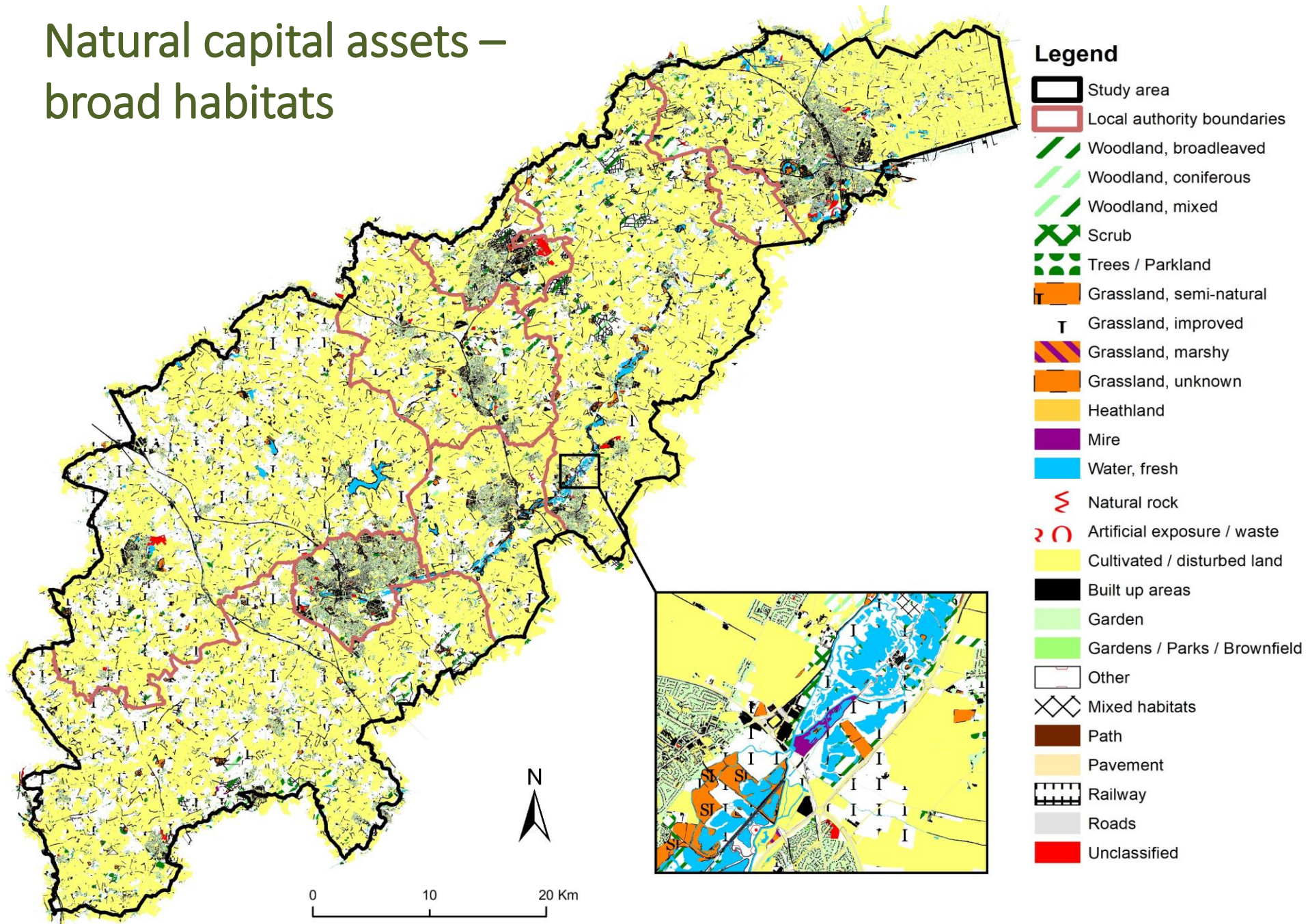


Habitat opportunity mapping

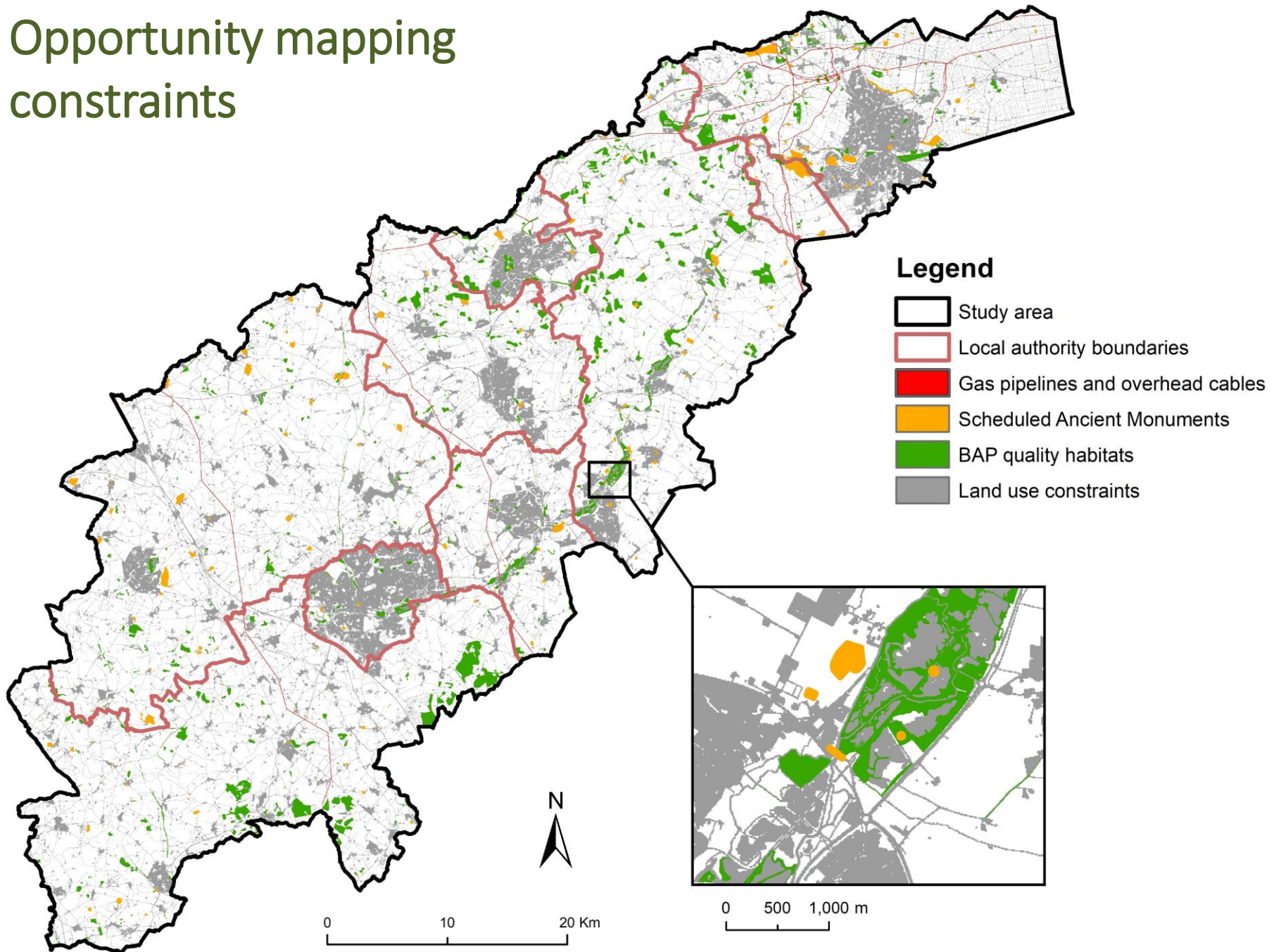
- A GIS based approach used to identify potential areas for the expansion of key habitats across a landscape.
- Requires a detailed map of natural capital assets (habitat map) and takes constraints into account.
- Mapped opportunities for the following:
 1. To enhance biodiversity
 2. To reduce surface runoff
 3. To reduce soil erosion and improve water quality
 4. To ameliorate air pollution
 5. To increase access to natural greenspace
- Maps combined to highlight opportunities to deliver multiple benefits at the same time.



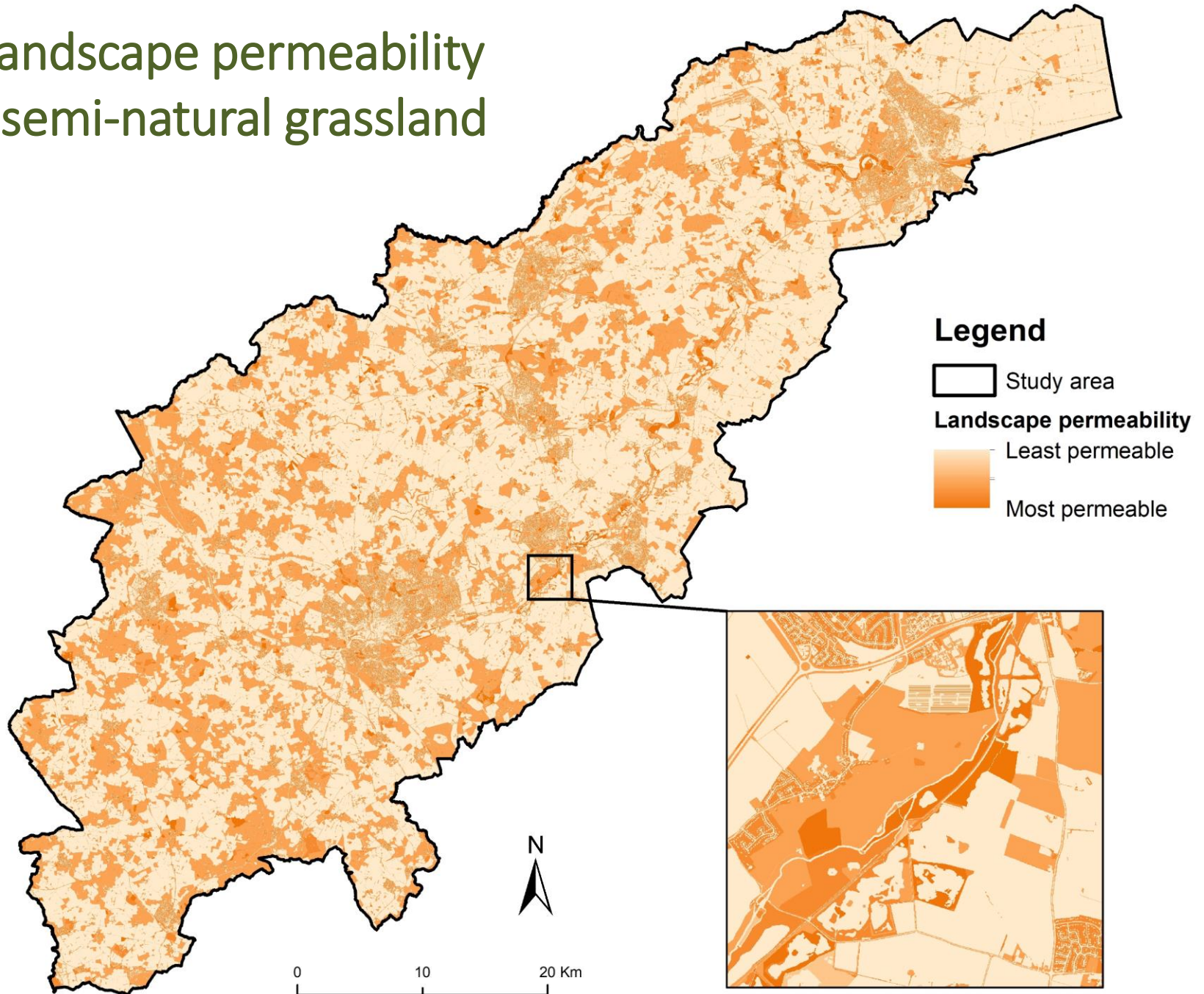
Natural capital assets – broad habitats



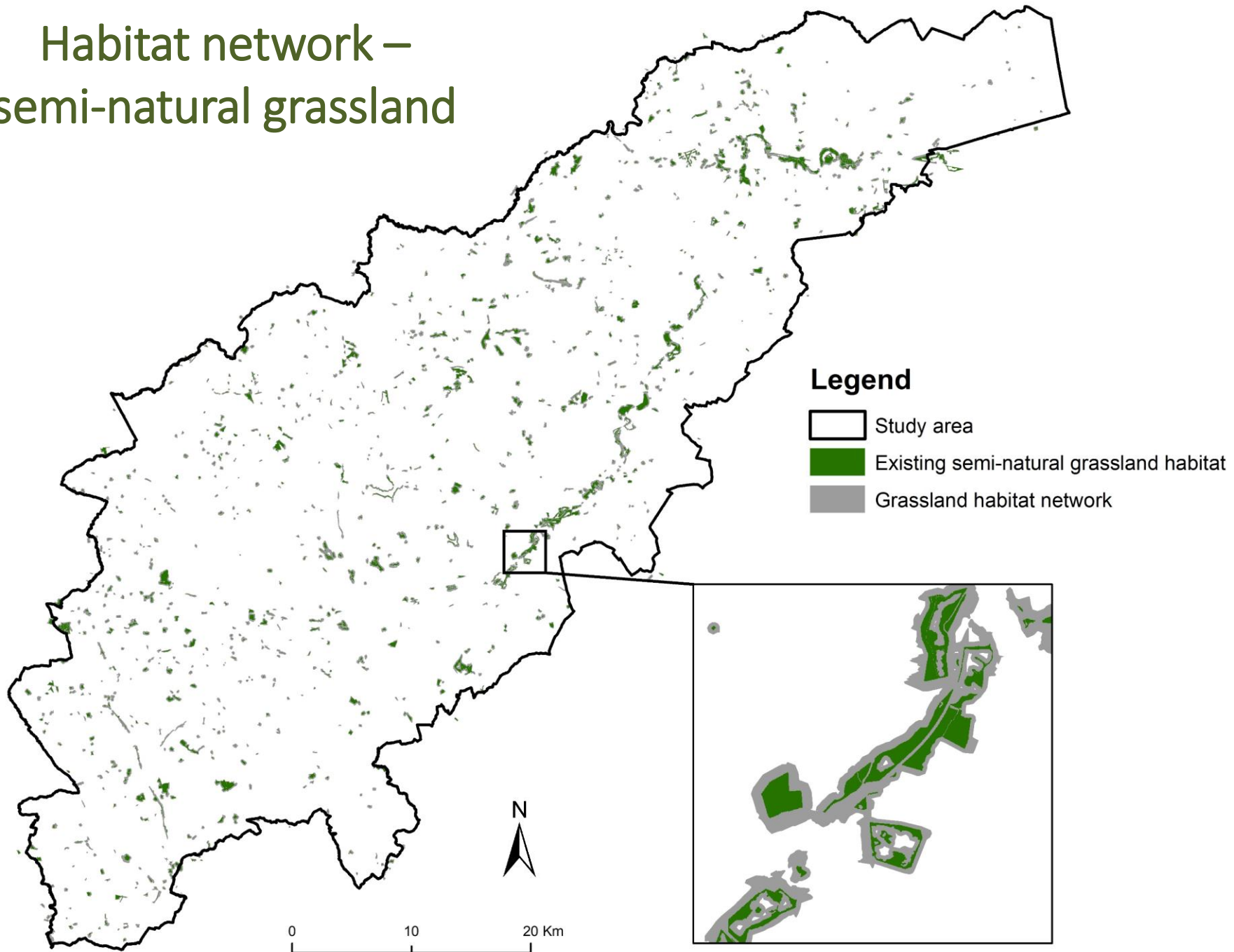
Opportunity mapping constraints



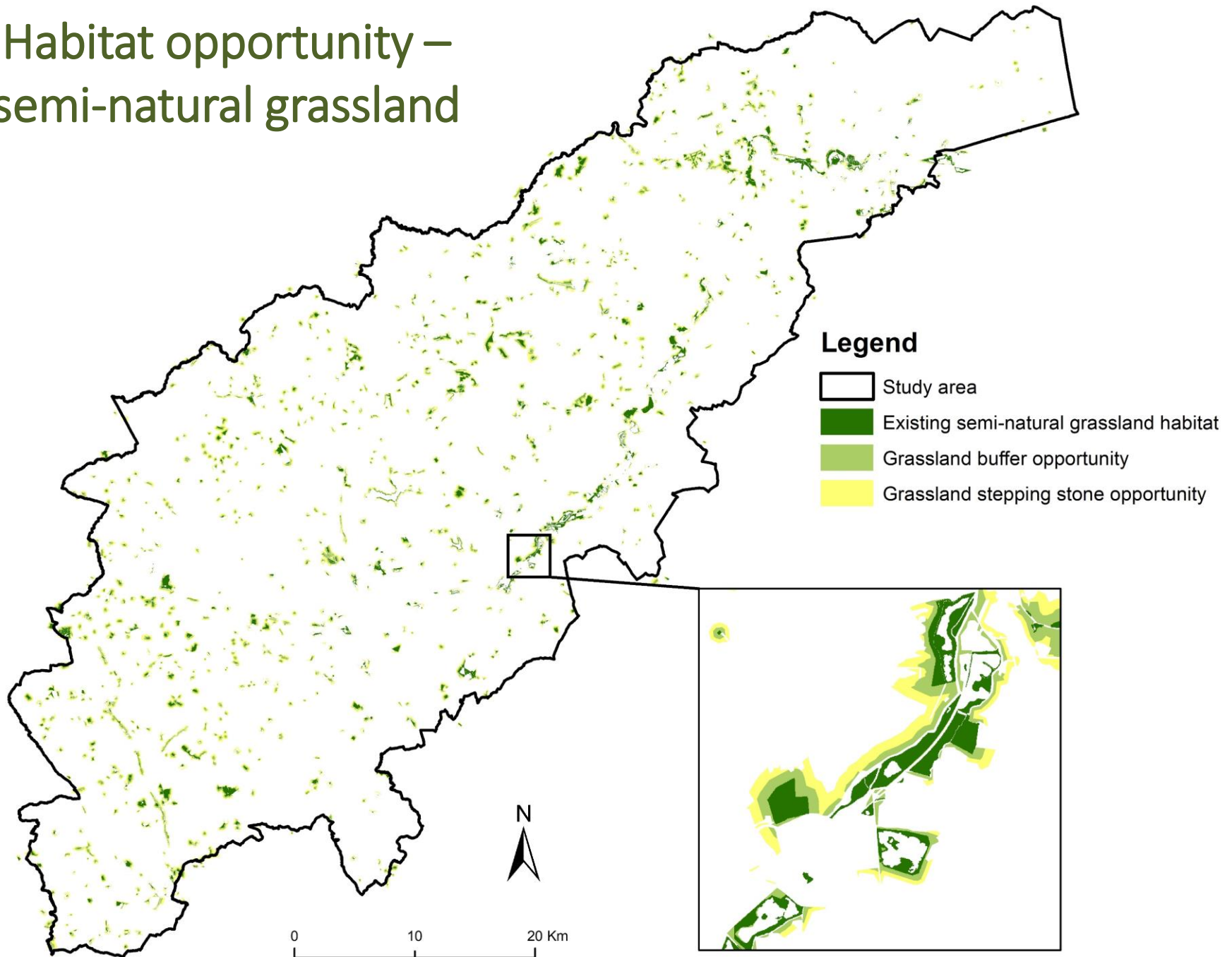
Landscape permeability - semi-natural grassland



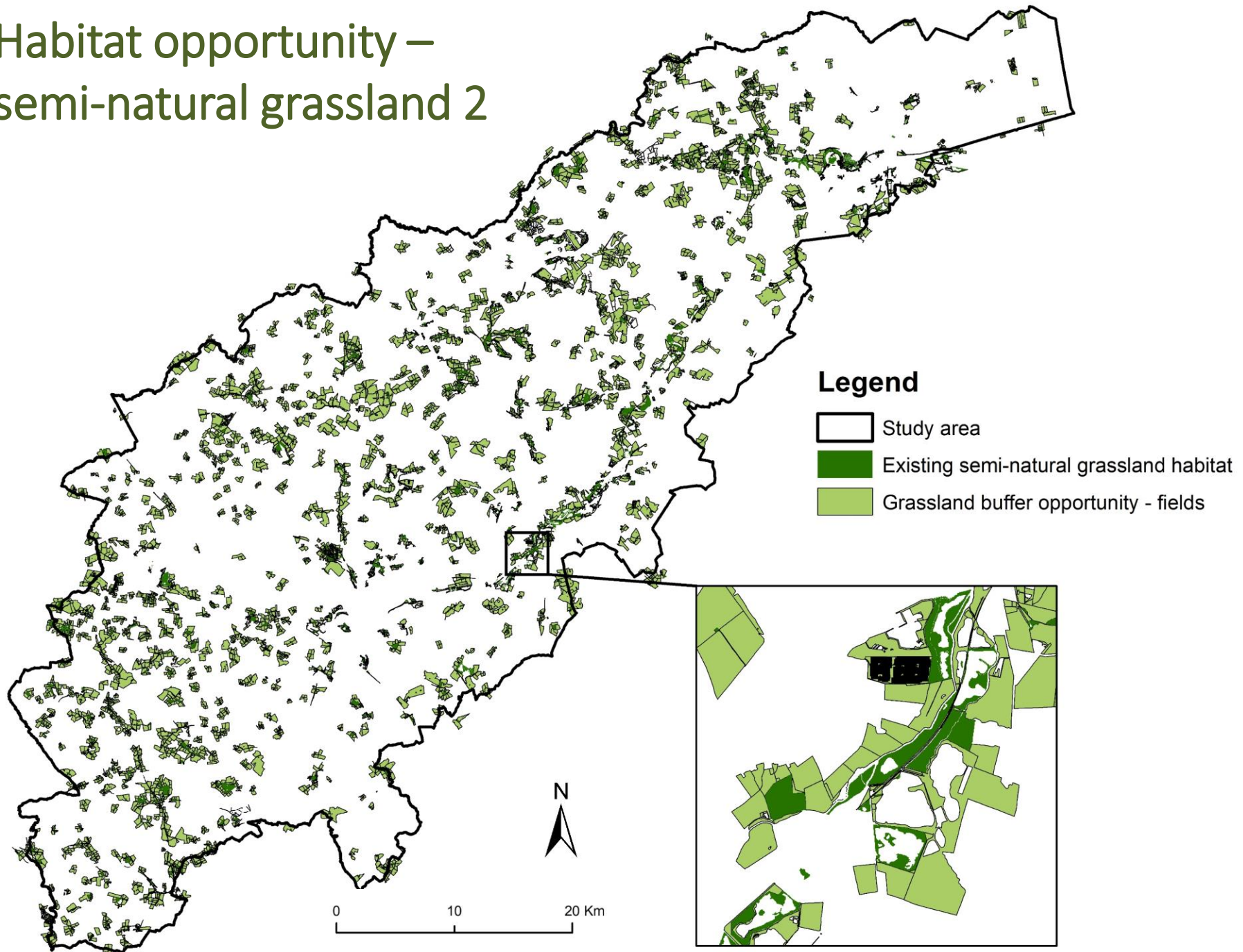
Habitat network – semi-natural grassland



Habitat opportunity – semi-natural grassland

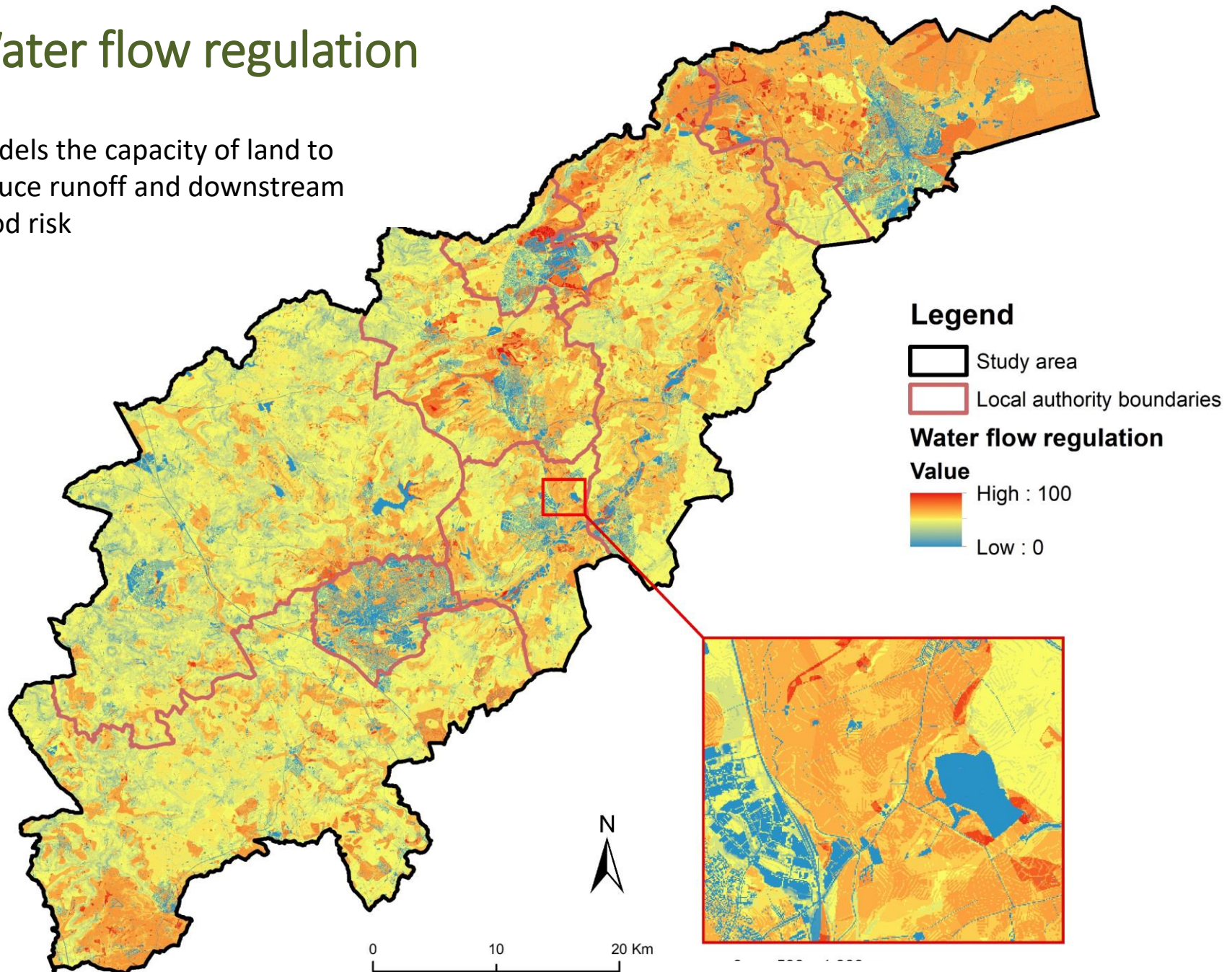


Habitat opportunity – semi-natural grassland 2



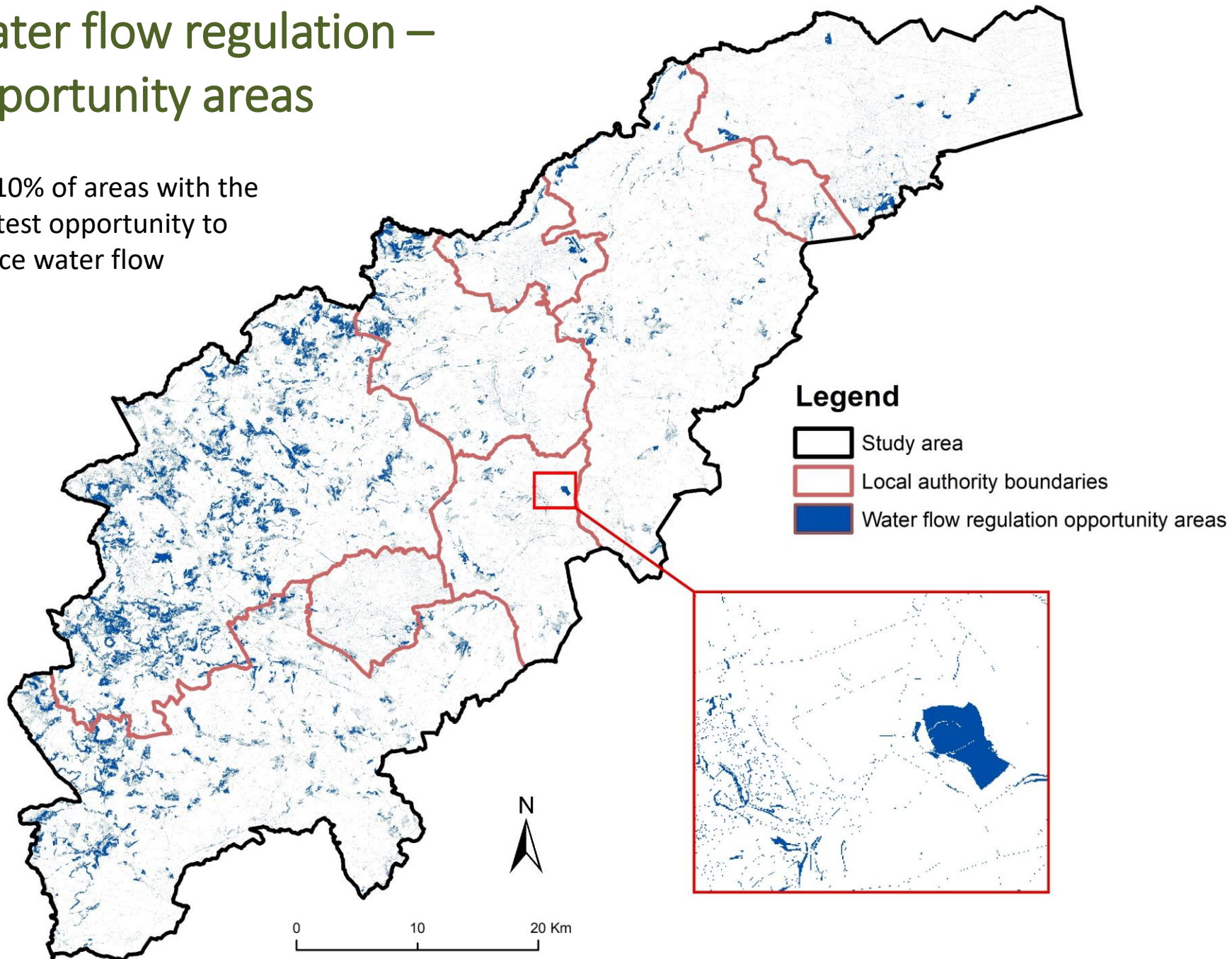
Water flow regulation

Models the capacity of land to reduce runoff and downstream flood risk



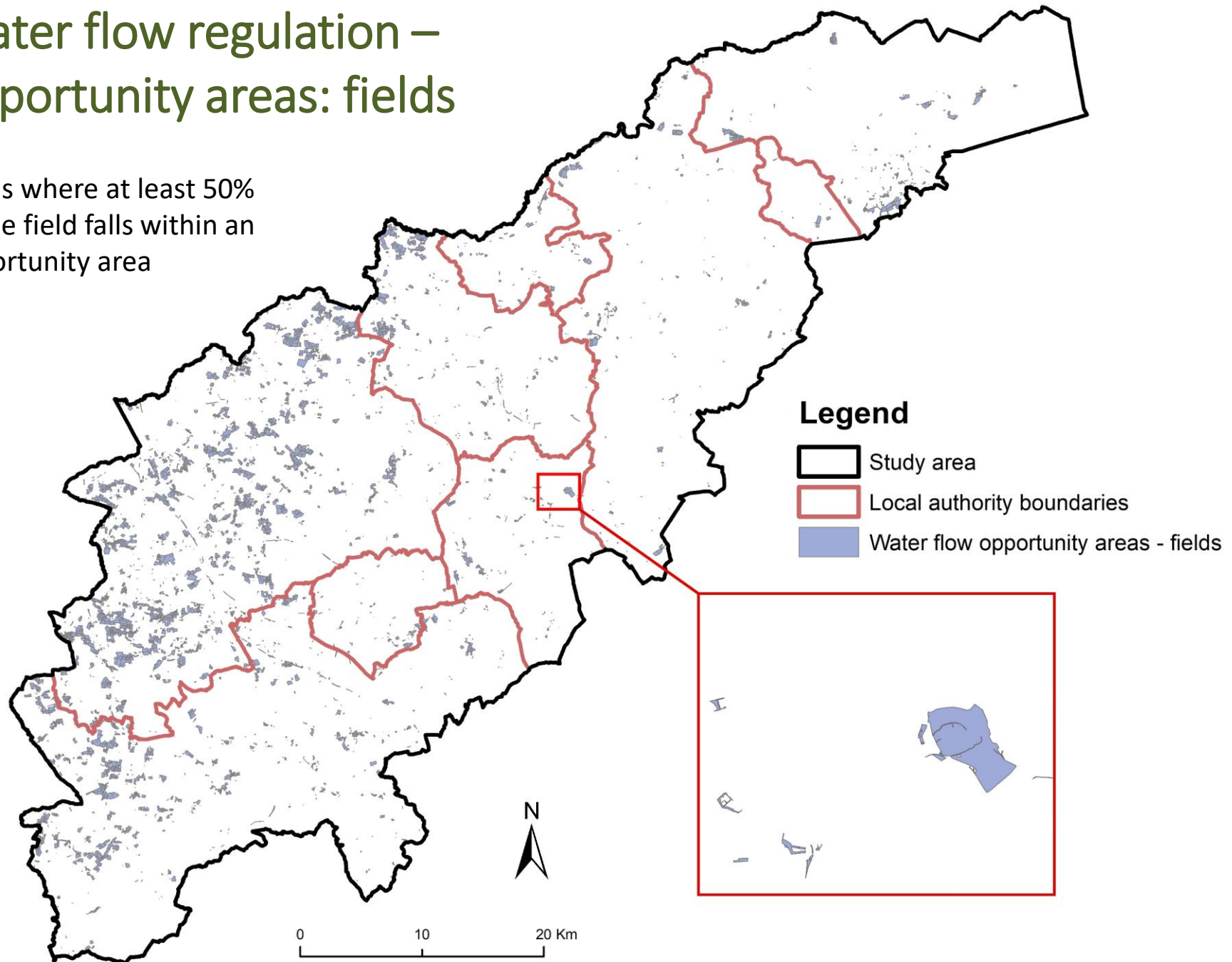
Water flow regulation – opportunity areas

Top 10% of areas with the
greatest opportunity to
reduce water flow



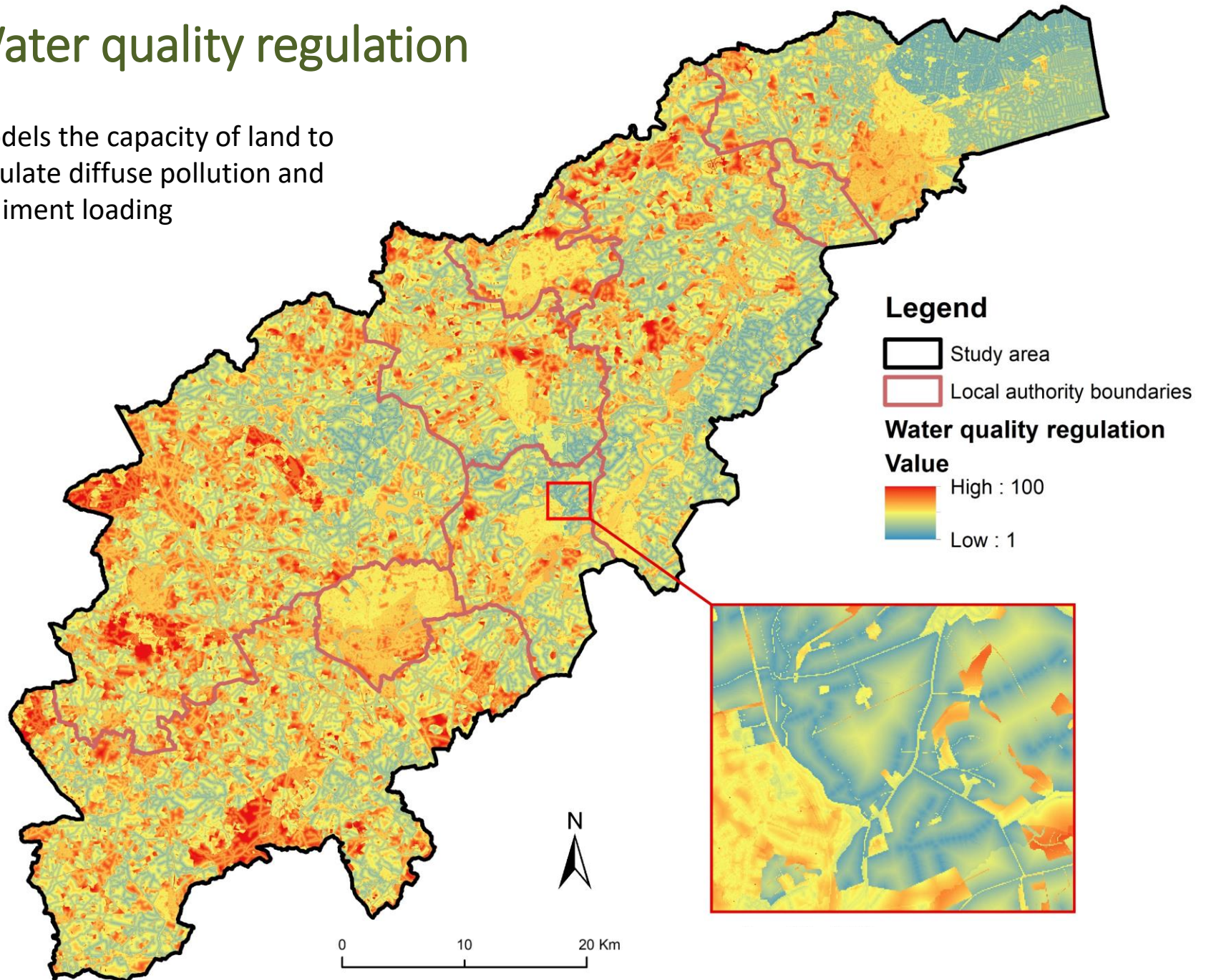
Water flow regulation – opportunity areas: fields

Fields where at least 50%
of the field falls within an
opportunity area



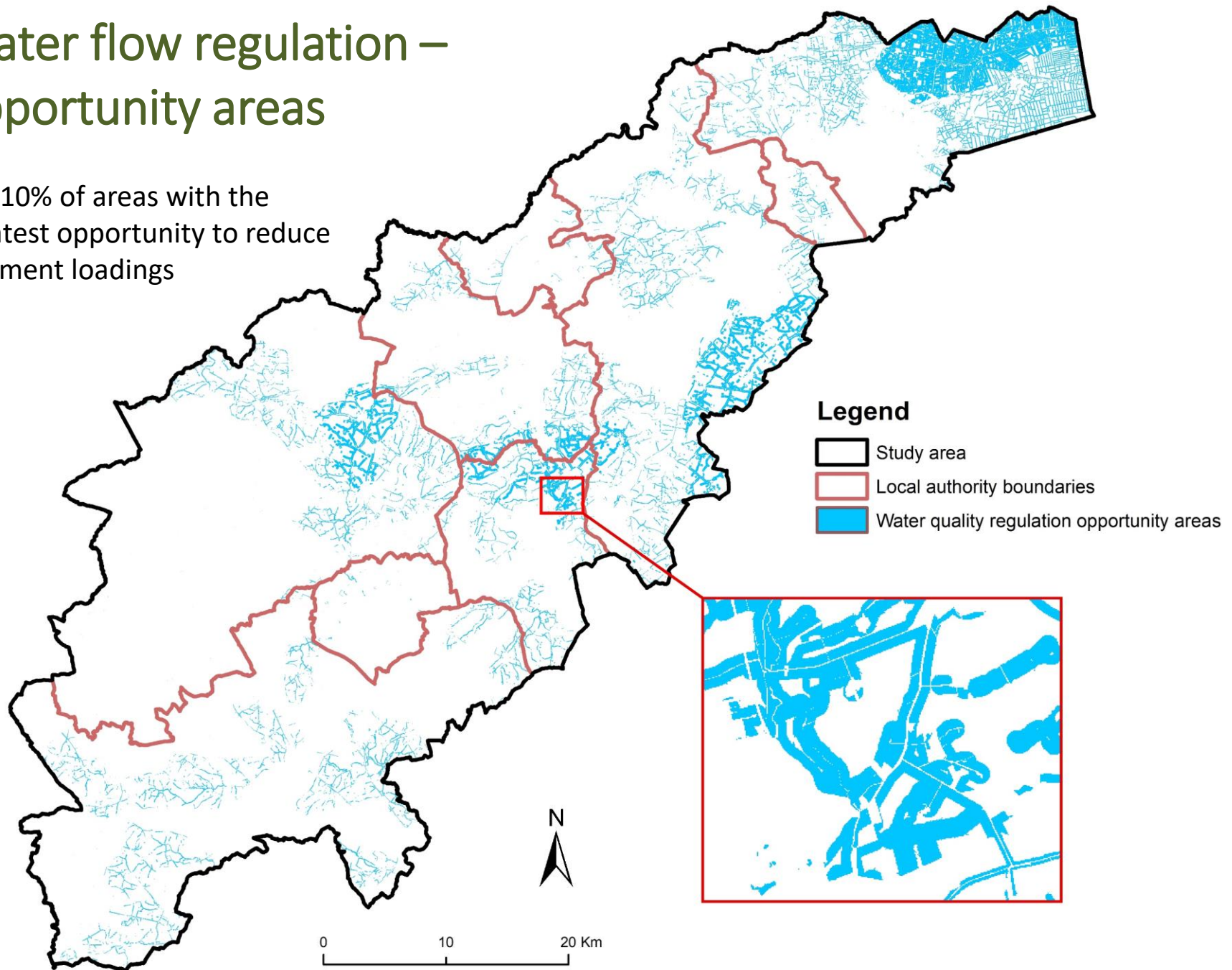
Water quality regulation

Models the capacity of land to regulate diffuse pollution and sediment loading



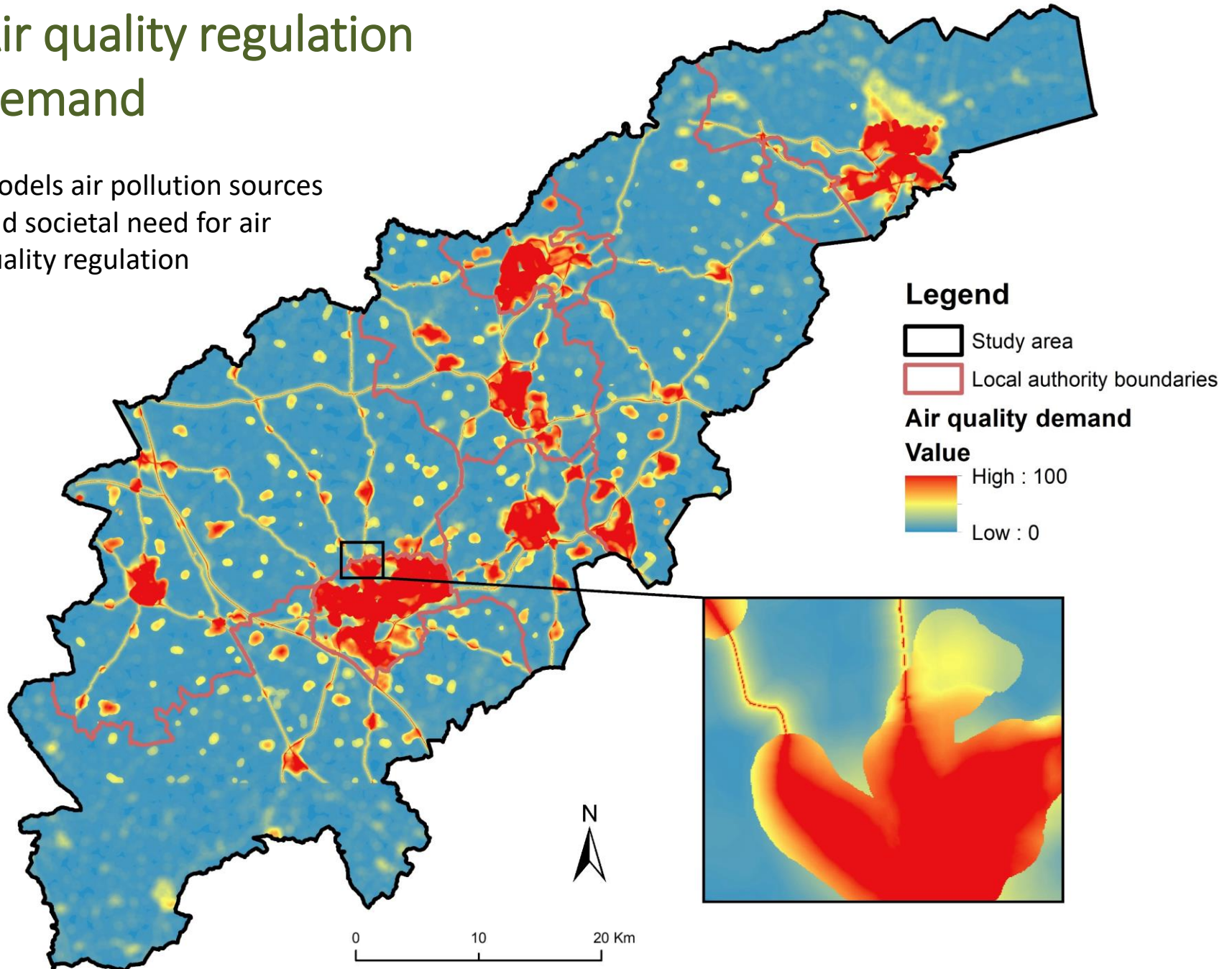
Water flow regulation – opportunity areas

Top 10% of areas with the
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sediment loadings



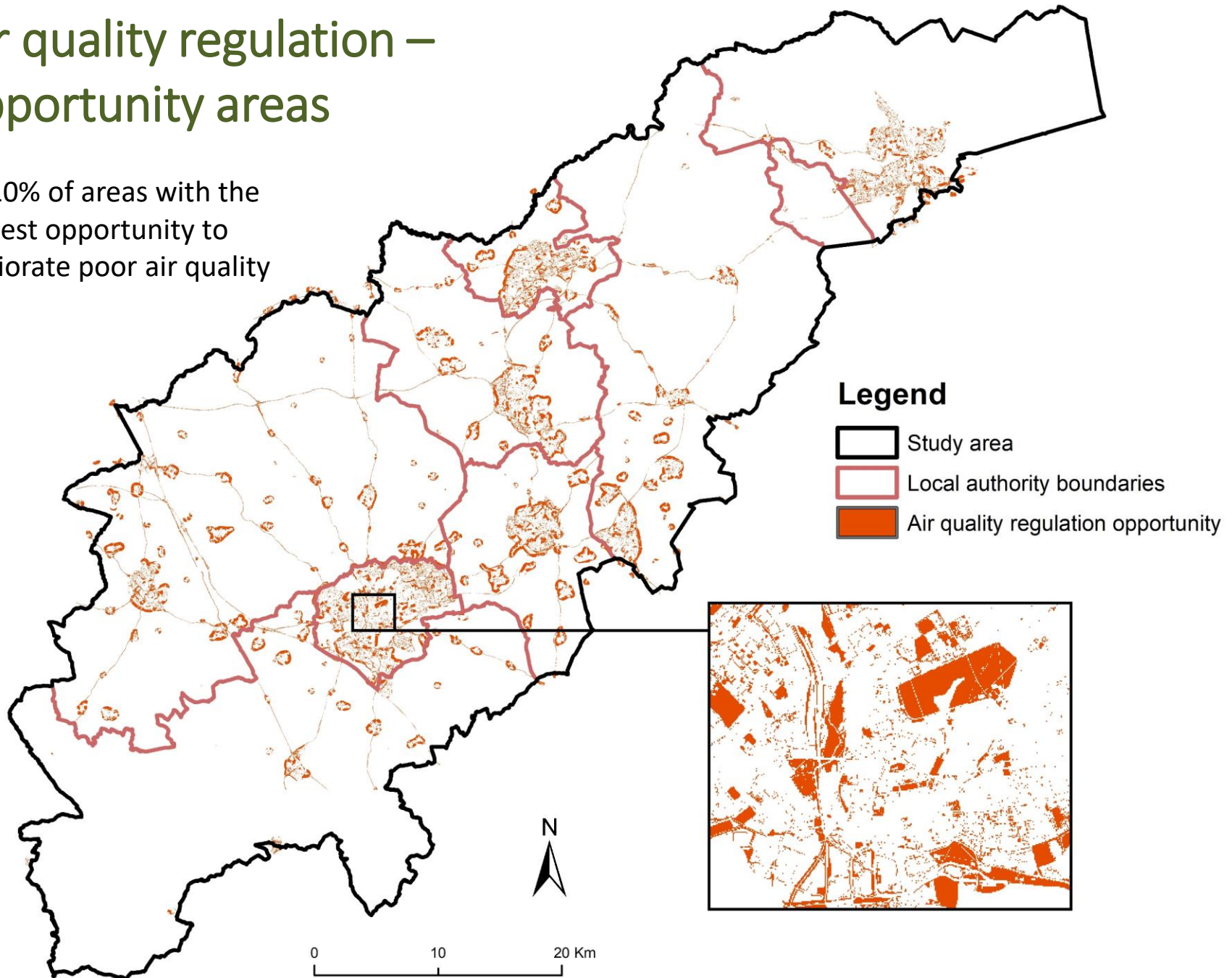
Air quality regulation demand

Models air pollution sources and societal need for air quality regulation



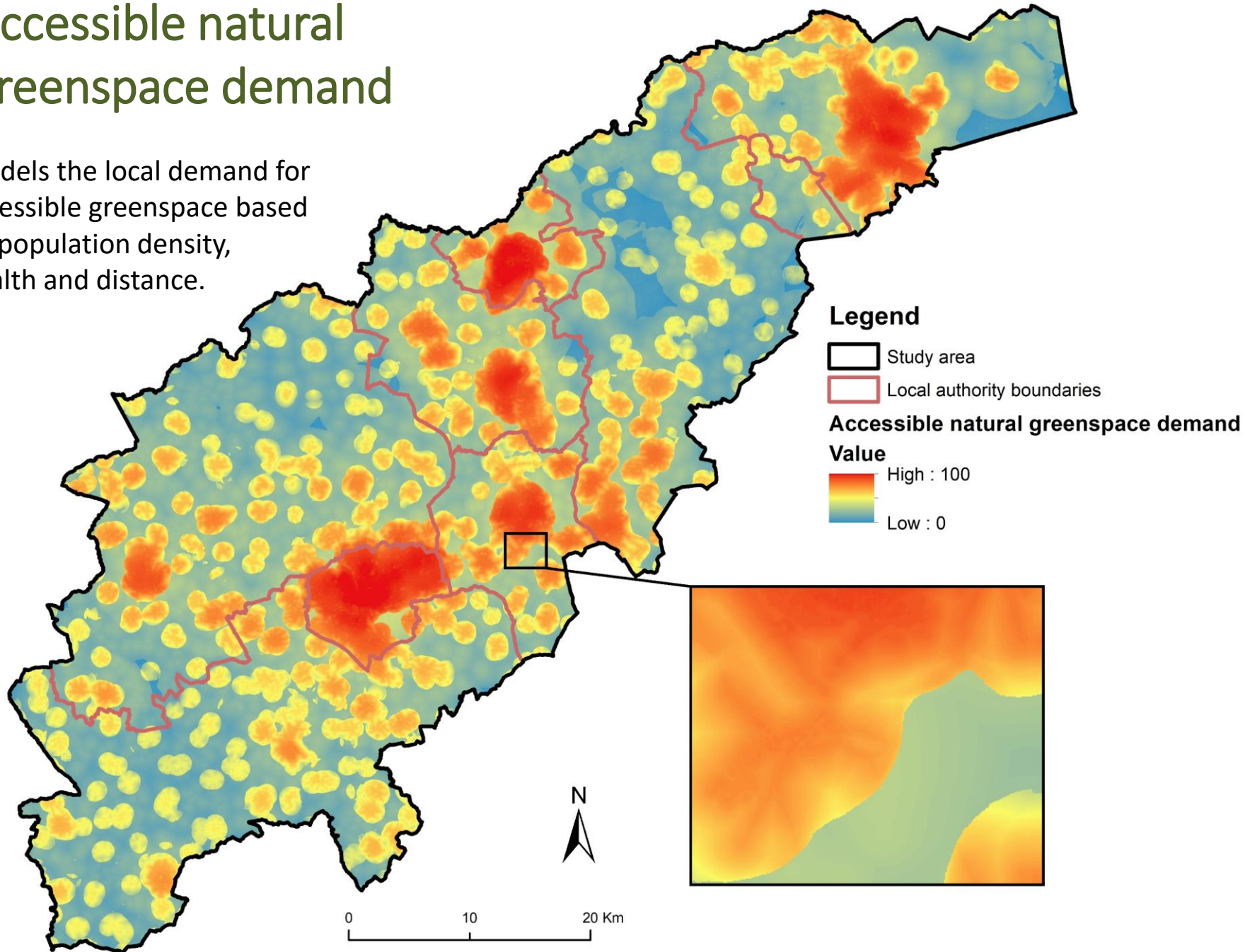
Air quality regulation – opportunity areas

Top 10% of areas with the
greatest opportunity to
ameliorate poor air quality



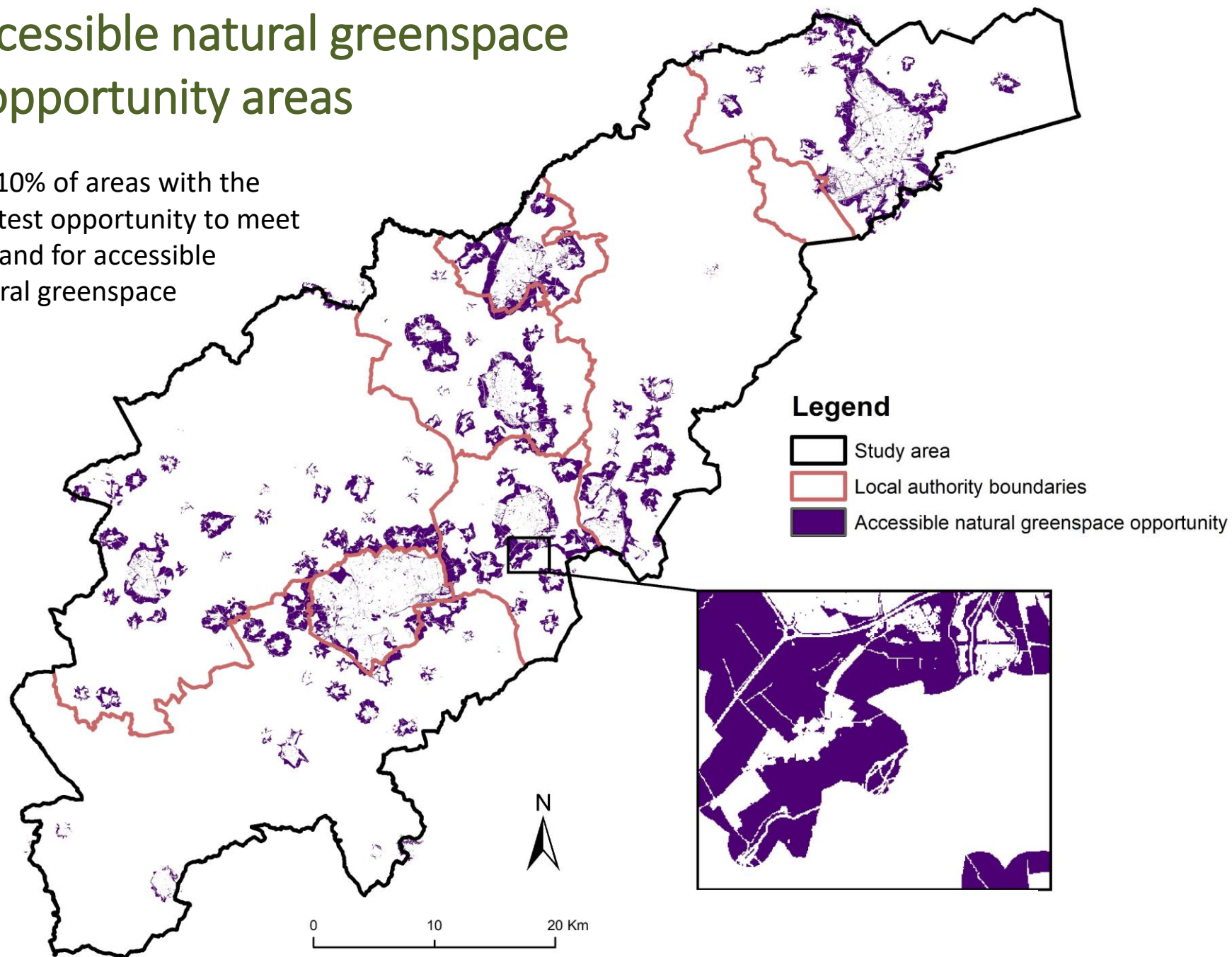
Accessible natural greenspace demand

Models the local demand for accessible greenspace based on population density, health and distance.

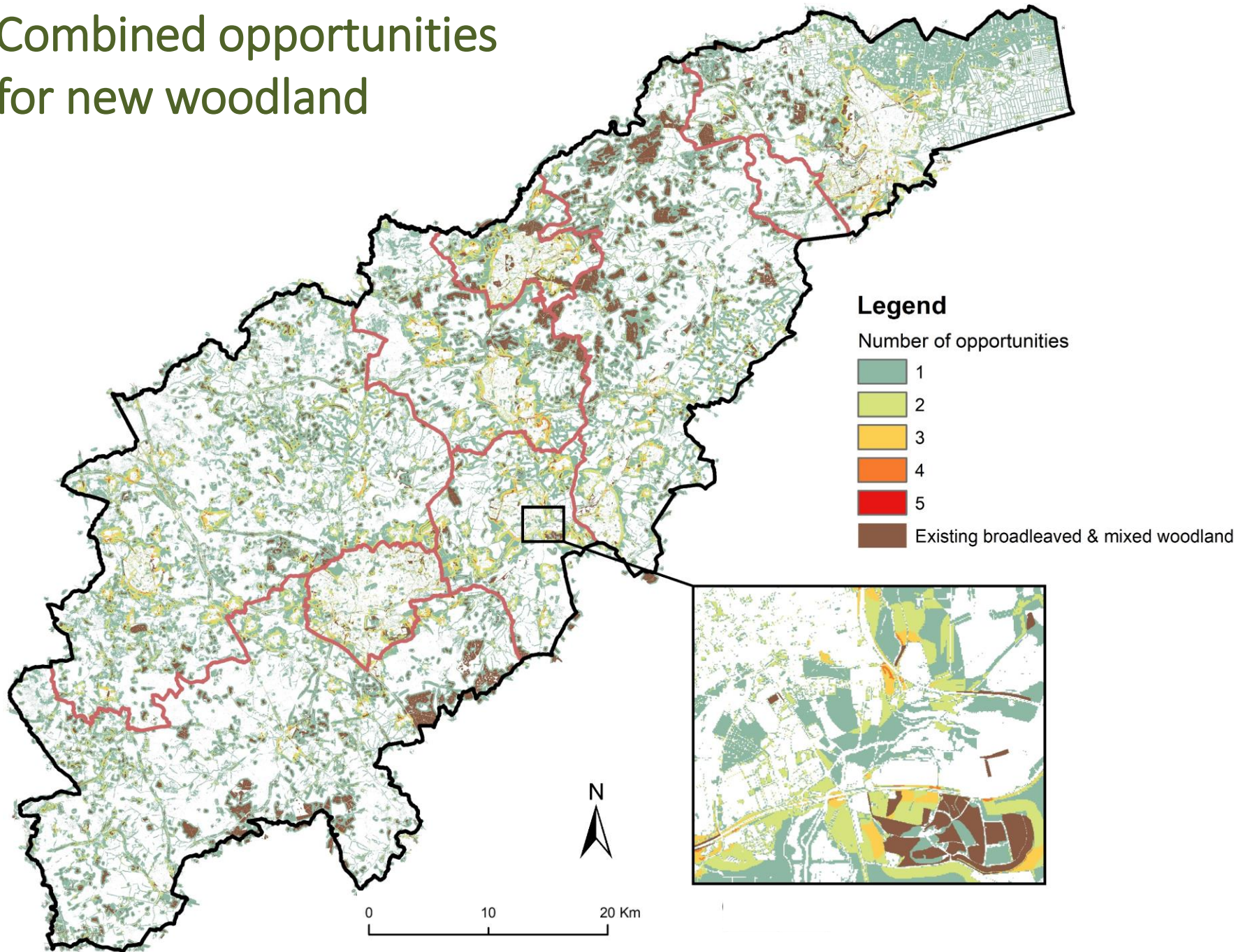


Accessible natural greenspace – opportunity areas

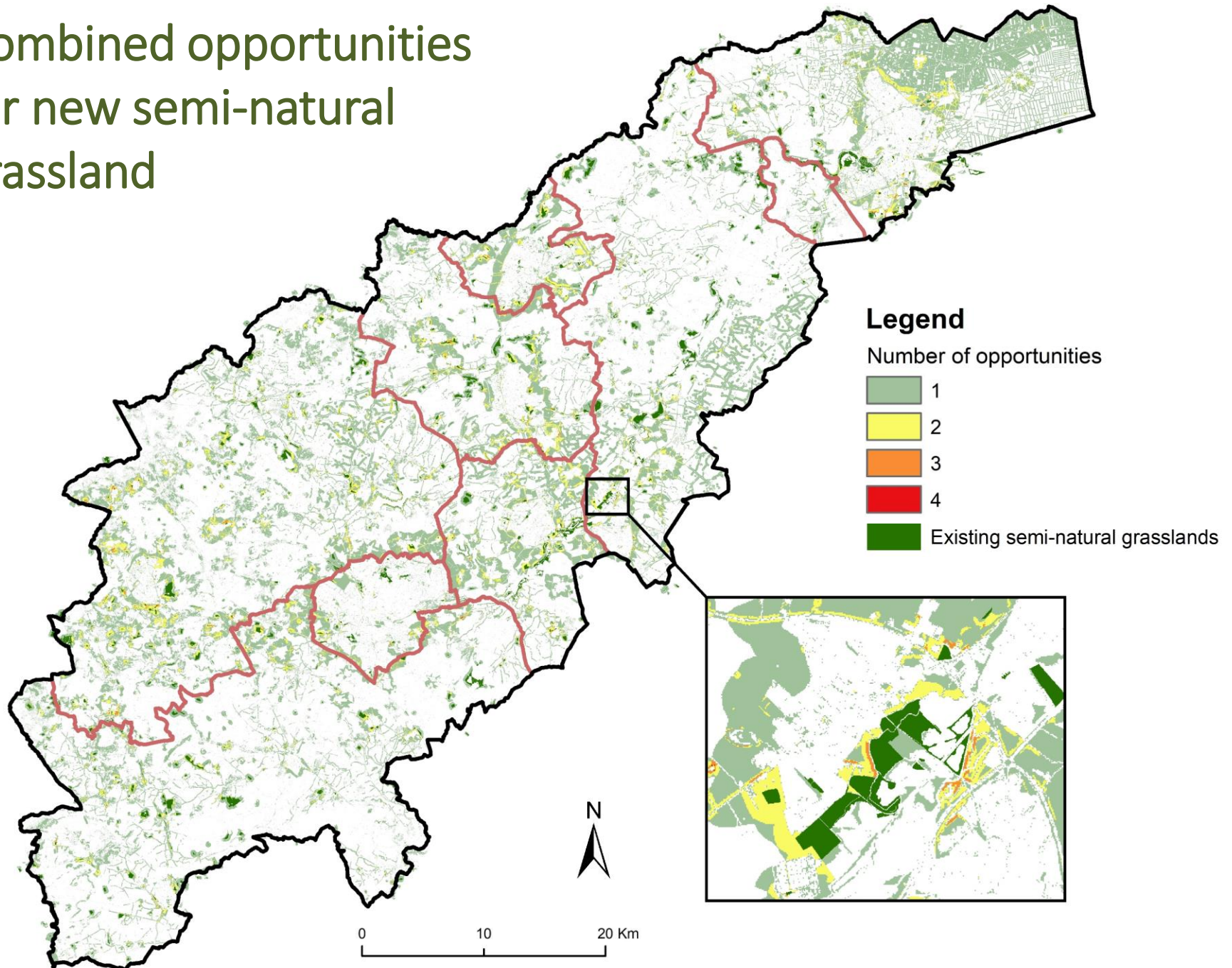
Top 10% of areas with the
greatest opportunity to meet
demand for accessible
natural greenspace



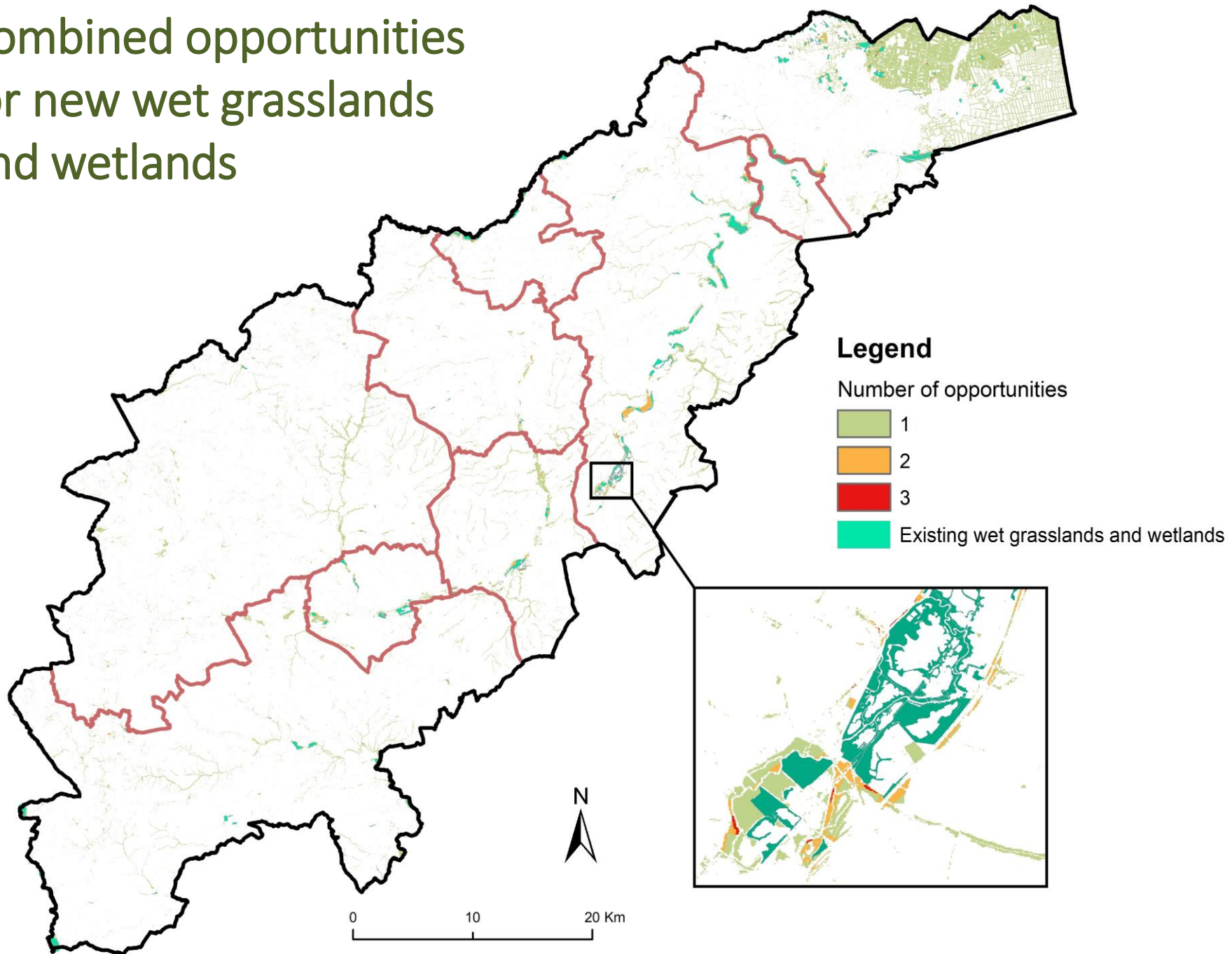
Combined opportunities for new woodland



Combined opportunities for new semi-natural grassland



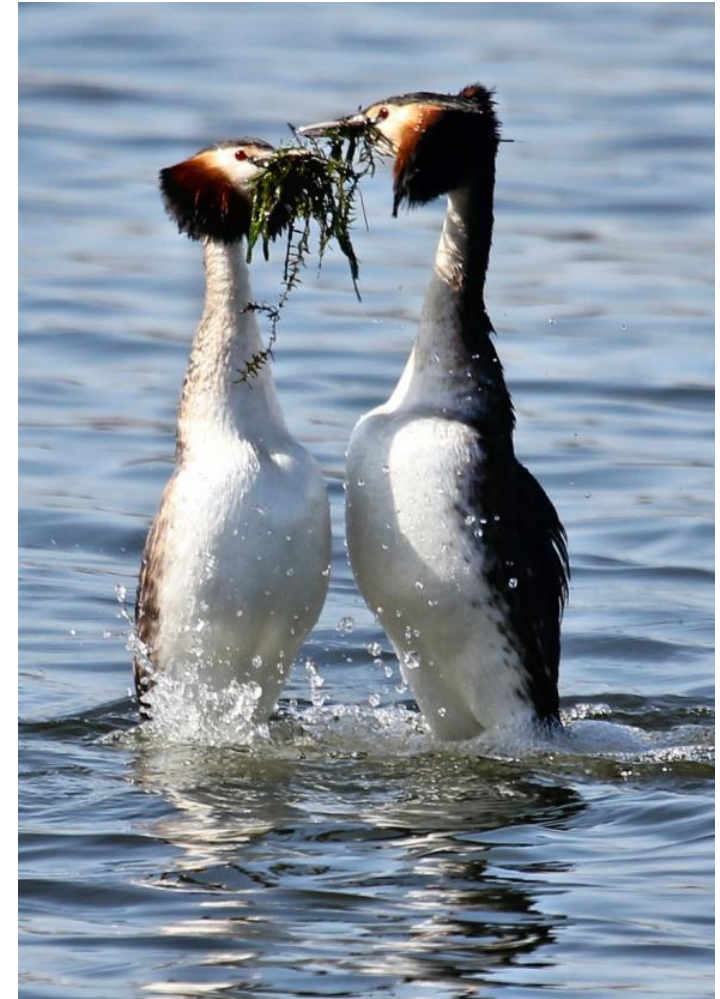
Combined opportunities for new wet grasslands and wetlands



Potential applications

Some applications of the opportunity maps:

- Evidence for Local Plans and green infrastructure strategies
- Locating the best places for biodiversity offsetting and natural capital net gain initiatives
- Agri-environment scheme targeting
- Natural flood risk management and catchment sensitive farming schemes
- Health and wellbeing initiatives
- UK Woodland Carbon Code projects
- Key step in producing a natural capital investment plan or strategy



Tresham Garden Village: A natural capital impact assessment



Tresham Garden Village

- Proposed new garden village development near Corby in East Northamptonshire.
- Plans includes 1500 houses, schools, employment zones, and associated infrastructure. Also green space and large areas of new woodland.
- What will be the impact of the development on natural capital and ecosystem services?
- Can the masterplan be improved to deliver more?
- What lessons can be learned to guide uptake of the approach?



Assessing natural capital and ecosystem services at Tresham

1. Map natural capital assets prior to development
2. Model and map ecosystem service flows prior to development
3. Model and map natural capital assets and ecosystem service flows after development
4. Run stakeholder workshop to determine priorities and enhance design
5. Re-run ecosystem services models to determine if new designs have improved outcomes



Key habitats - baseline

Legend

-  Tresham boundary
-  Arable
-  Improved grassland
-  Semi-natural grassland
-  Marshy grassland
-  Woodland and scrub
-  Water
-  Road or track
-  Built up areas

0 300 600 Metres



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Key habitats - masterplan

Legend

-  Tresham boundary
-  Arable
-  Improved grassland
-  Mixed use grassland
-  Semi-natural grassland
-  Marshy grassland
-  Allotments
-  Parkland
-  Orchard
-  Woodland and scrub
-  Water
-  Homes (new)
-  School
-  Employment
-  Road or track
-  Built up areas

0 300 600 Metres



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Mapping ecosystem services

The following ecosystem services were mapped and assessed:

1. Carbon storage
2. Carbon sequestration
3. Air quality regulation
4. Noise regulation
5. Water flow
6. Water quality
7. Pollination
8. Agricultural production
9. Timber production
10. Accessible nature
11. Biodiversity

Maps show current capacity (supply), and (where possible) demand for ES

**EcoServ-GIS**

Version 3.3
A toolkit for mapping ecosystem services in England,
Scotland and Wales (GB)

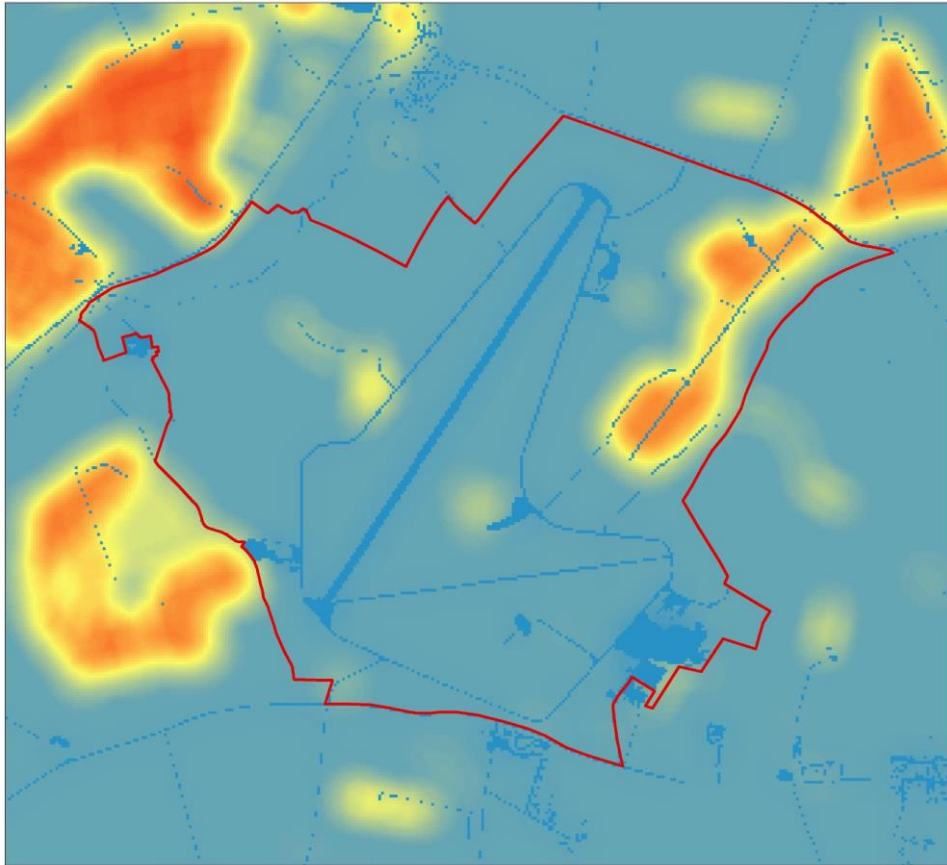


User Guide September 2015



Noise regulation capacity

Baseline

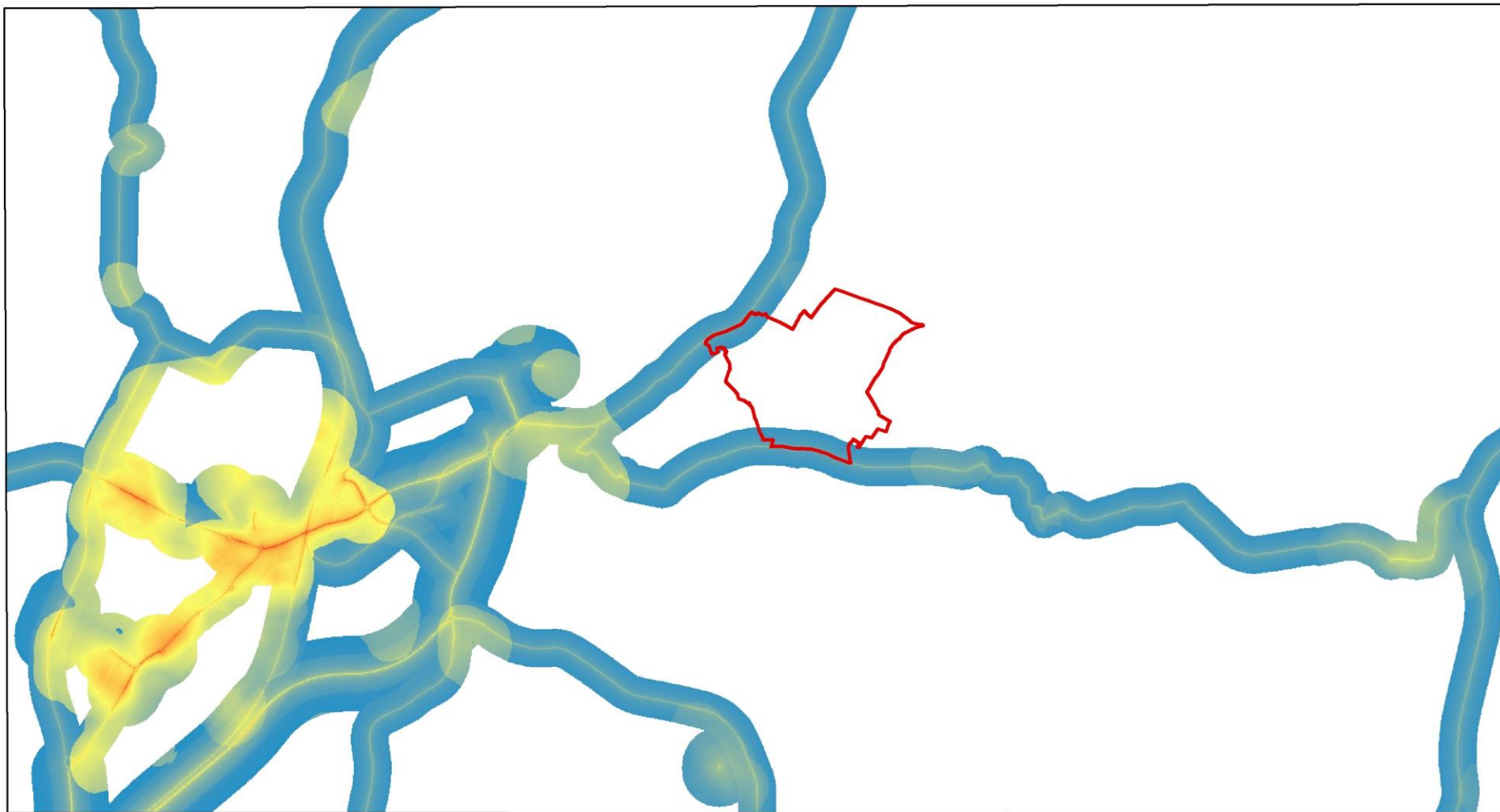


Masterplan



Estimates the relative ability of vegetation to diffuse and absorb noise pollution

Noise regulation demand - baseline



 Tresham boundary

Noise regulation demand

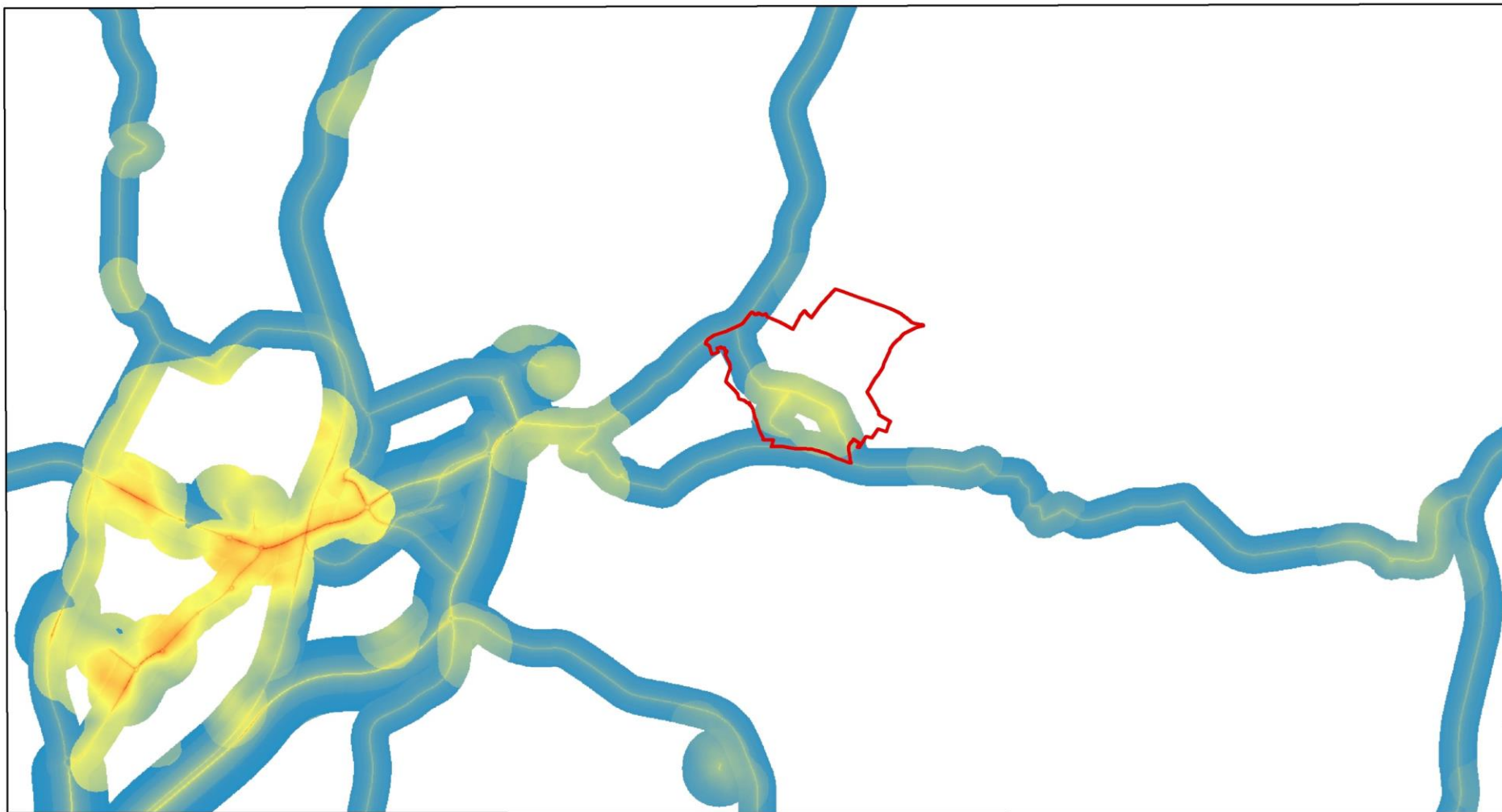
 High : 100
Low : 1

0 2 4 km



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Noise regulation demand - masterplan



 Tresham boundary

Noise regulation demand

 High : 100
Low : 1

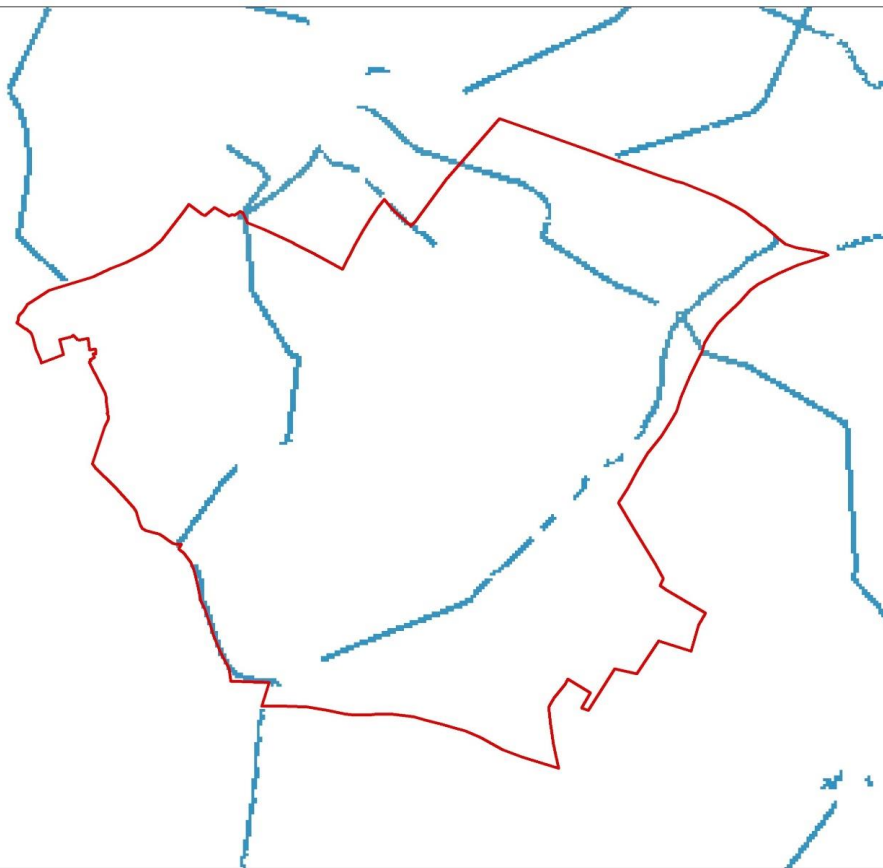
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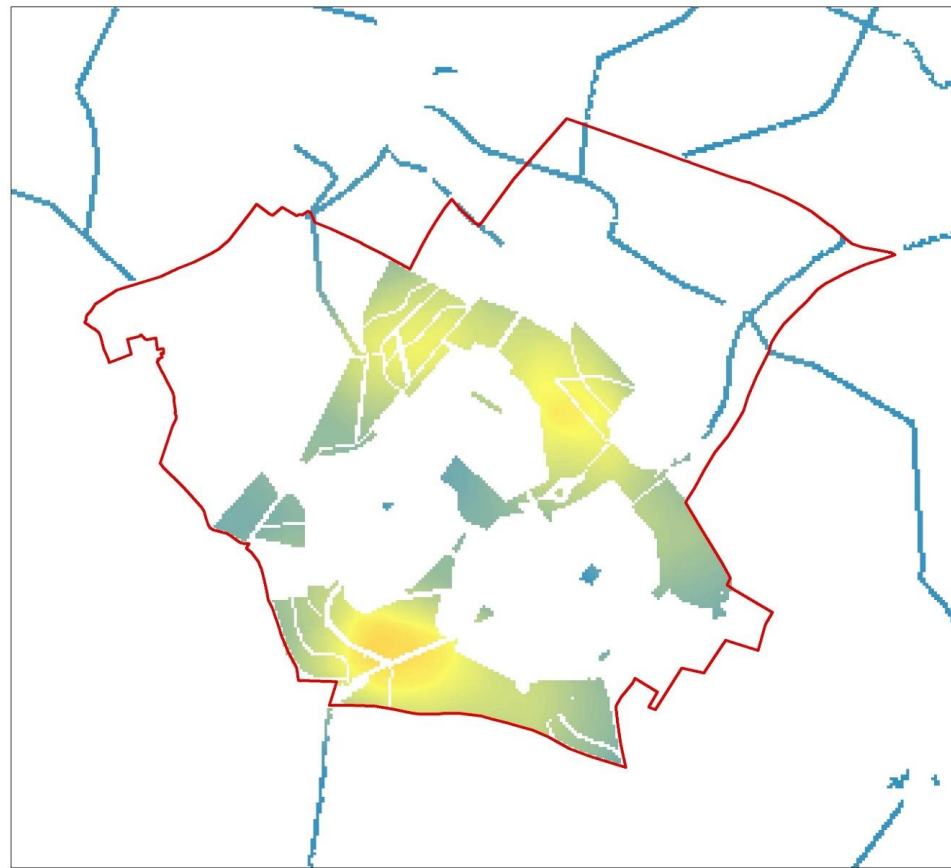
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Accessible nature capacity

Baseline

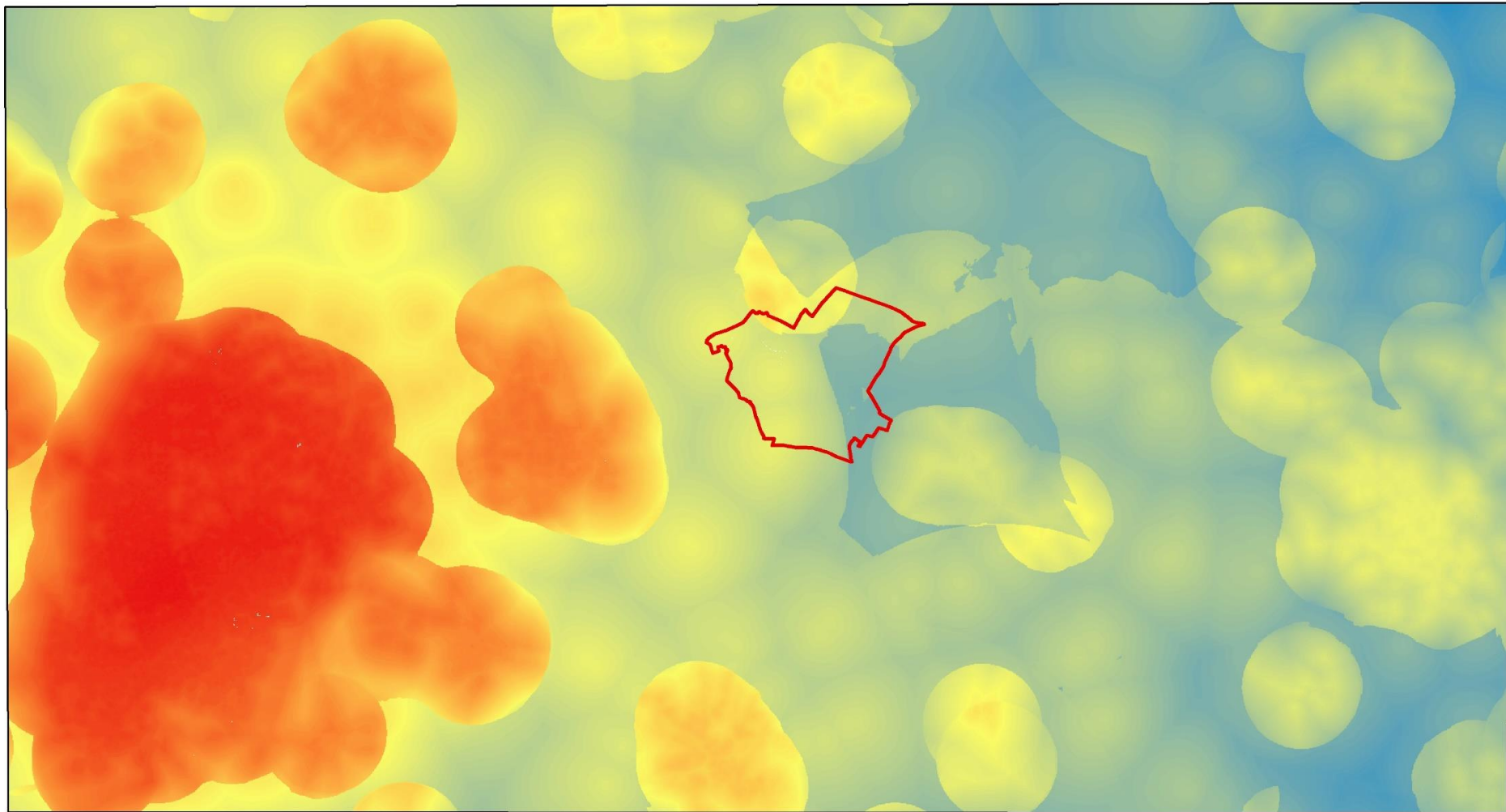


Masterplan



Models the perceived naturalness of the area and whether it is publicly accessible

Accessible nature demand – baseline



 Tresham boundary

Accessible nature demand

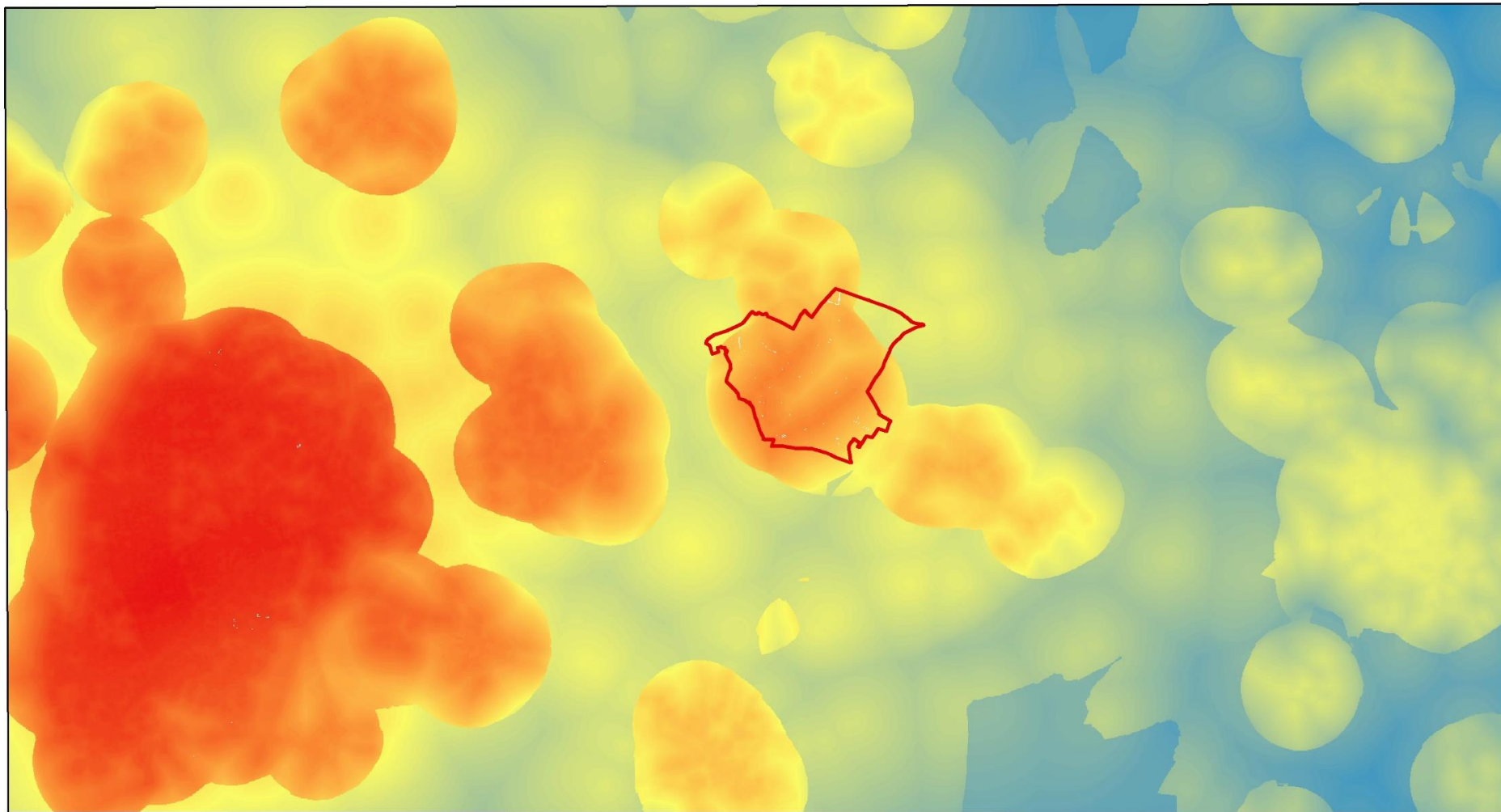
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Accessible nature demand - masterplan



 Tresham boundary

Accessible nature demand

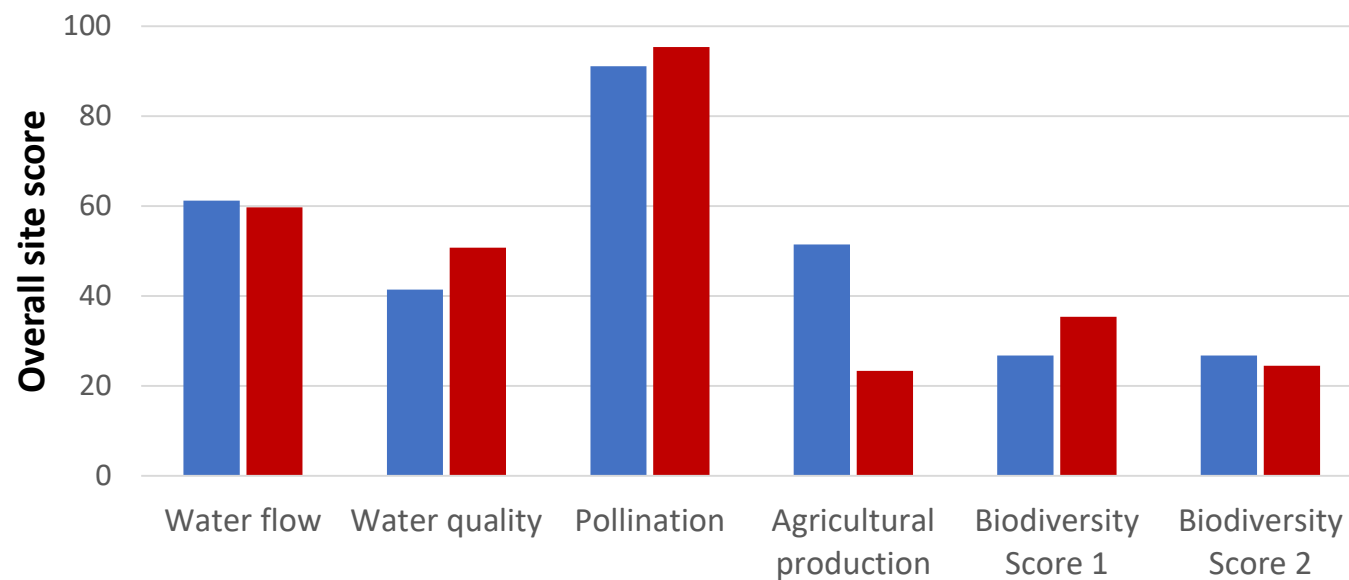
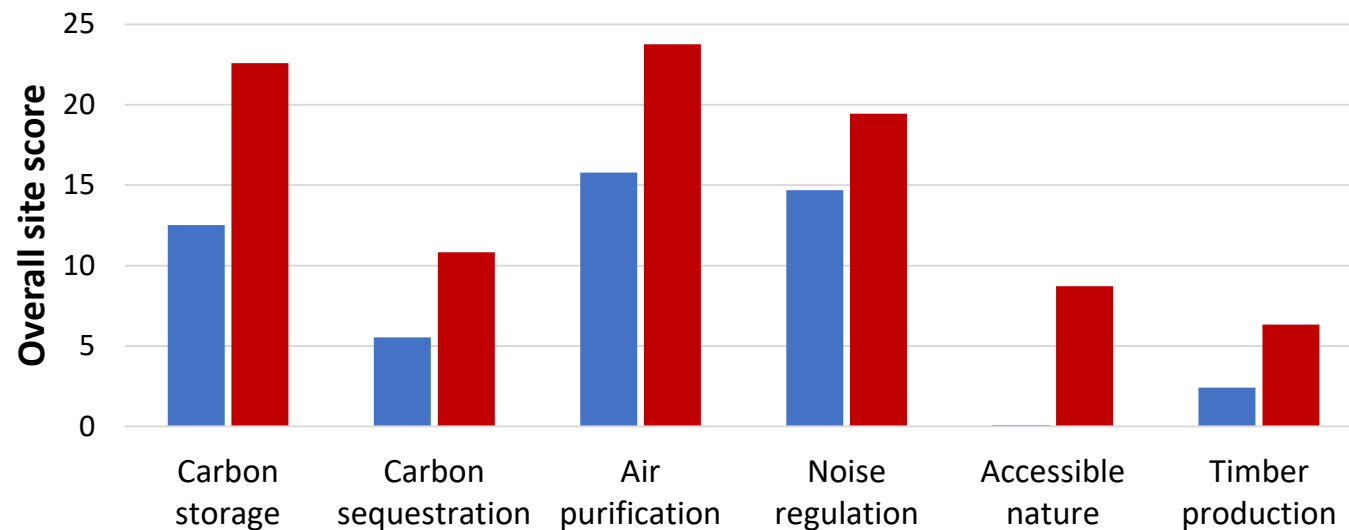
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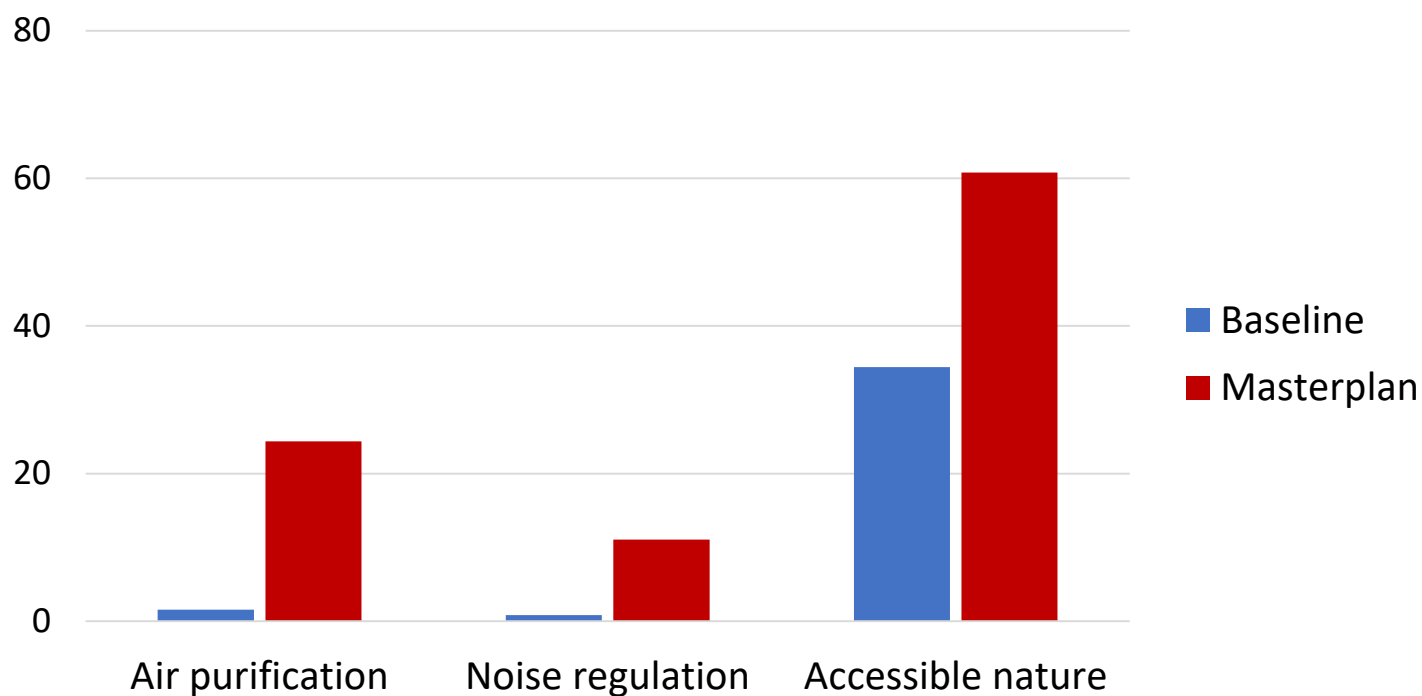


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Overall supply of ecosystem services



Overall demand for ecosystem services



Key points – Tresham case study

- The proposed development broadly increases both supply and demand for most ecosystem services
- New woodland planting surrounding core built zone is particularly beneficial
- Ecosystem service delivery could be increased further – highlighted through assessment and stakeholder workshop
- Can be used to evaluate environmental net gain
- The approach used is applicable elsewhere in the planning and development sector



The natural capital approach in planning and development

- A natural capital approach is embedded across multiple Government policies but little knowledge of how to do this in practice
- Likely to be a requirement for environmental net gain as part of all new developments
- Mapping can be used to highlight the spatial location and distribution of benefits (and demand) and opportunity areas to enhance natural capital
- Natural capital and ecosystem services can be assessed before and after proposed developments to determine net impact and enhance design
- Natural capital approaches (including valuation and accounting) are useful at highlighting the value of the natural environment, which may otherwise remain hidden.

