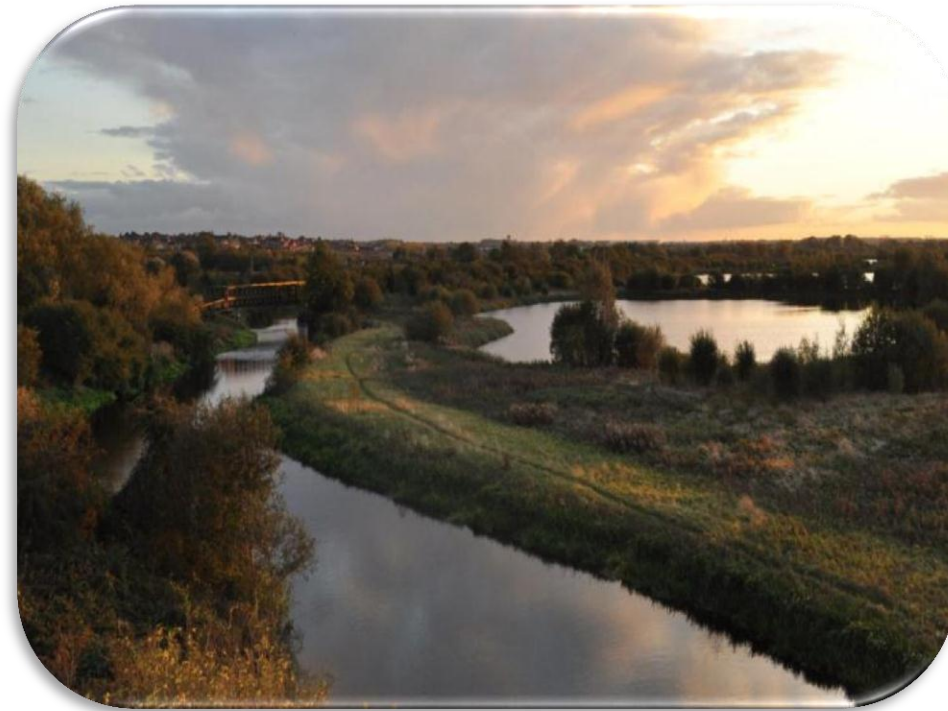


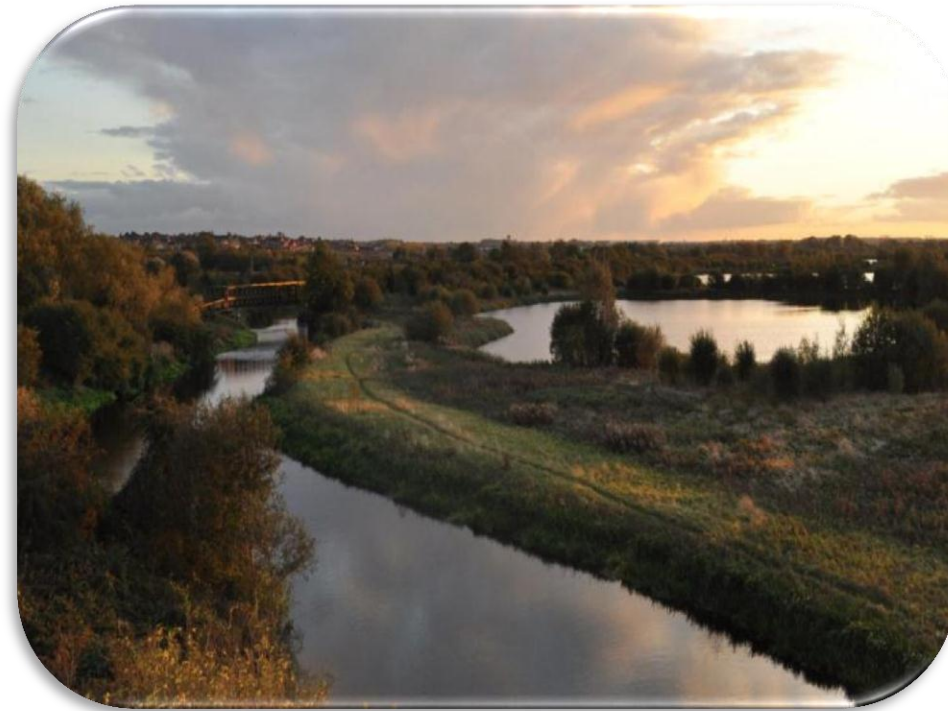
Assessing Ecosystem Services & Biodiversity in the Nene Valley



Jim Rouquette

Stella Watts, Kat Harrold, Heather Ball, Duncan McCollin and Jeff Ollerton

Ecosystem services assessment as a tool for biodiversity conservation



Jim Rouquette

Stella Watts, Kat Harrold, Heather Ball, Duncan McCollin and Jeff Ollerton

Outline

- Ecosystem services assessments for site-based conservation
- Landscape scale conservation: the Nene Valley Nature Improvement Area
- Mapping ecosystem services & biodiversity
- Applying the results for biodiversity conservation

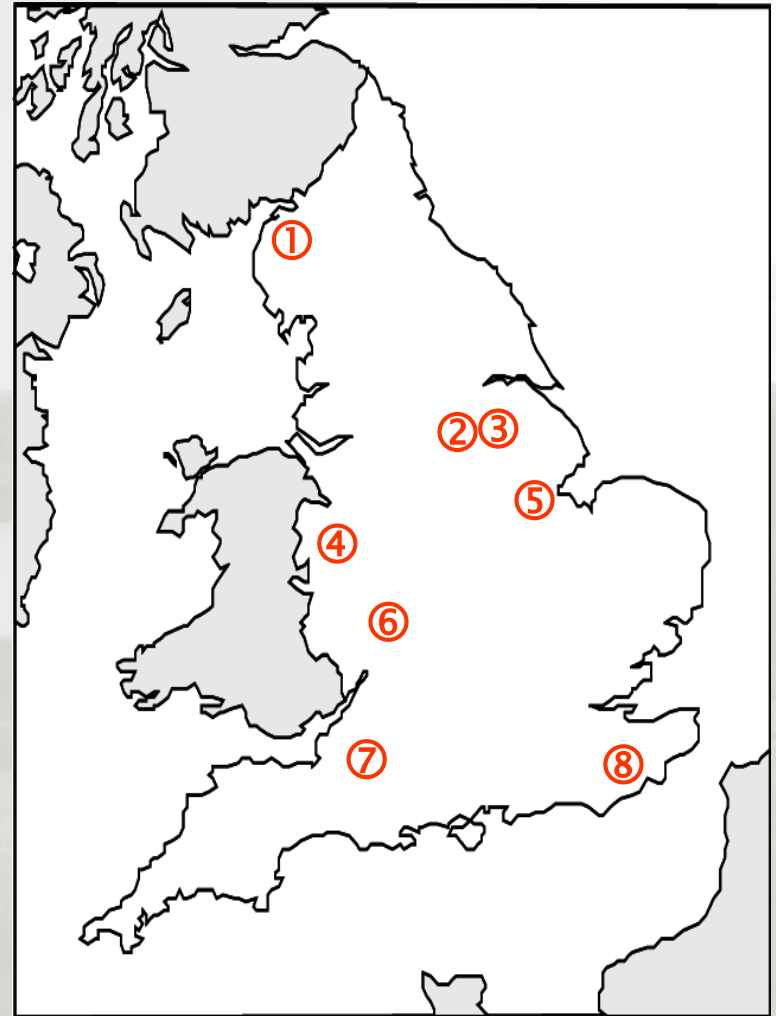




**(Re)creation of floodplain meadows:
an ecosystem services evaluation**

Approach

- 8 case study sites in England
- Predominantly agricultural floodplains
- Previously subject to land drainage improvement schemes
- Farmer survey
- Hydrological survey
- Ecological survey



Collaborators:

Helena Posthumus, David Gowing,
Tim Hess and Joe Morris



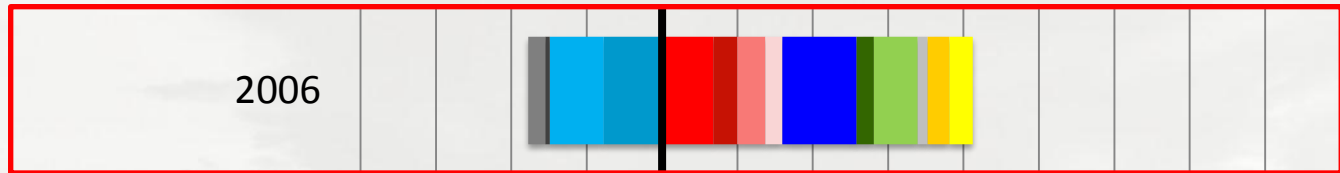
Scenario modelling

5 single-objective scenarios were developed for each site:

- 1: Maximizing agricultural production
- 2: Enhancing biodiversity within an agricultural system
- 3: Enhancing biodiversity outside of an agricultural system
- 4: Maximizing flood storage
- 5: Maximizing farm income

The impact on ecosystem services was then modelled





- Agricultural production [P]
- Financial return [P]
- Employment [P]
- Soil quality [P]
- Floodwater storage [R]
- Water quality [R]
- Greenhouse gas balance [R]
- Habitat provision [H]
- Species [H]
- Transport [C]
- Settlement [C]
- Space for Water [C]
- Recreation [I]
- Landscape [I]

Production

Biodiversity

Floodwater storage

Agri-environment

Income

-4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9

Cumulative indicator score



**Landscape-scale conservation:
The Nene Valley Nature Improvement Area**





Upper Nene Valley Gravel Pits SPA



> 5,000 golden plover
11 significant winter species
21 breeding species

Meadows



Threat or opportunity?





Nature Improvement Areas (NIAs)

**Making Space for Nature:
A review of England's Wildlife Sites and Ecological
Network**

Chaired by Professor Sir John Lawton CBE FRS

HM Government

The Natural Choice:
securing the value
of nature



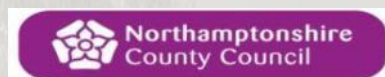
The idea for NIAs proposed in Lawton Report as Ecological Restoration Zones

The Natural Environment White Paper:
“We will enable partnerships to establish new Nature Improvement Areas (NIAs), based on a local assessment of opportunities for restoring and connecting nature on a significant scale.”

12 NIAs selected for share of £7.5M
Funded for 3 years from 2012-15

Nene Valley NIA objectives

1. Growth and development that supports the natural environment
2. Enhance public awareness and sustainable access
3. Improve ecological status of the river
4. Strengthen ecological network through farmer engagement
5. Investigate ecosystem services





Mapping ecosystem services

Which services?

Main mapping tool is EcoServ – being developed by the Wildlife Trusts

1. Carbon storage
2. Local climate regulation
3. **Pollination**
4. Noise regulation
5. Water purification
6. **Accessible nature experience**
7. Education opportunities
8. Wildlife watching
9. Food
10. Timber

EcoServ-GIS Version 2:

A Wildlife Trust toolkit for mapping multiple ecosystem services



User Guide

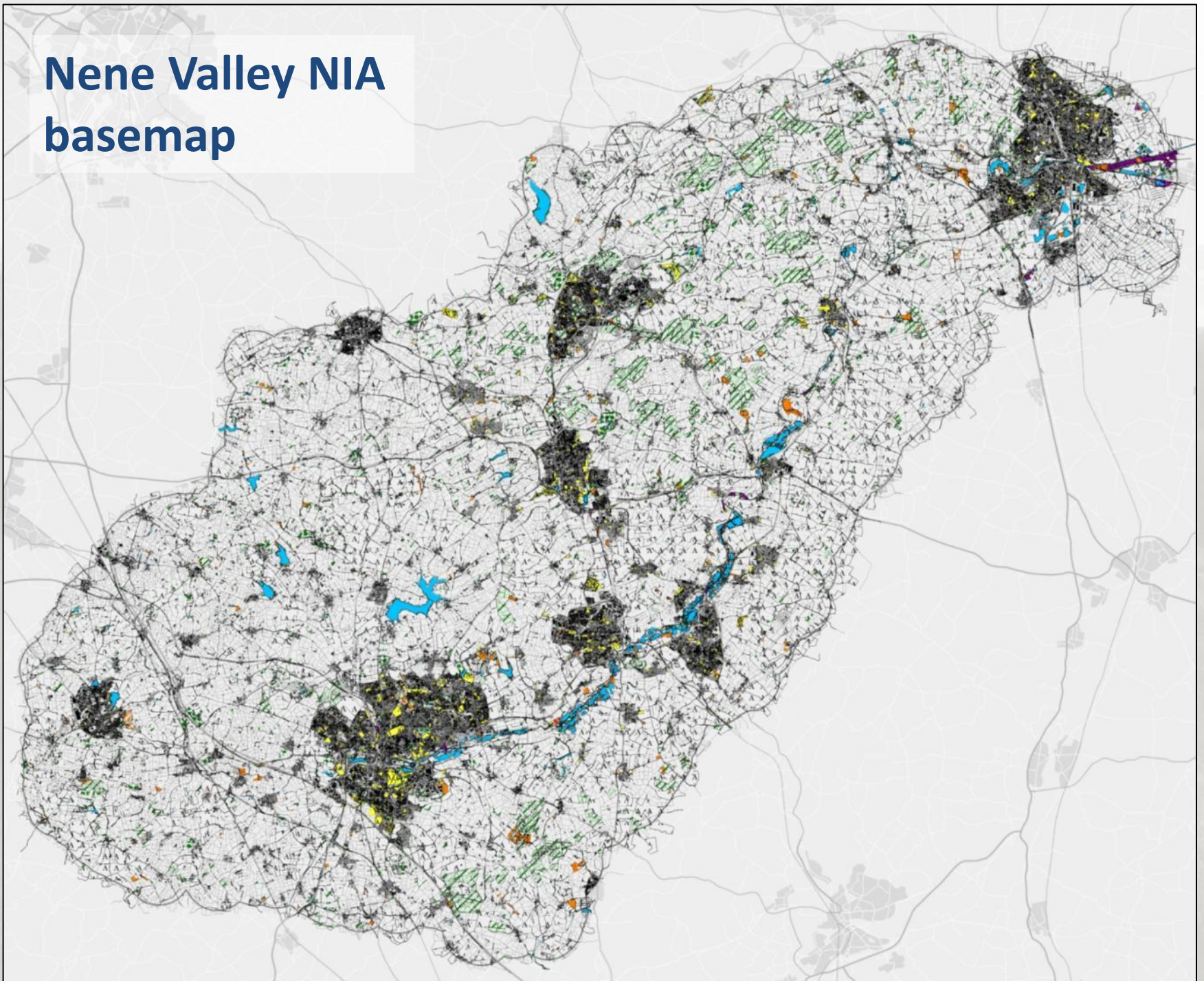
(Document Version 2.1)

Durham Wildlife Trust

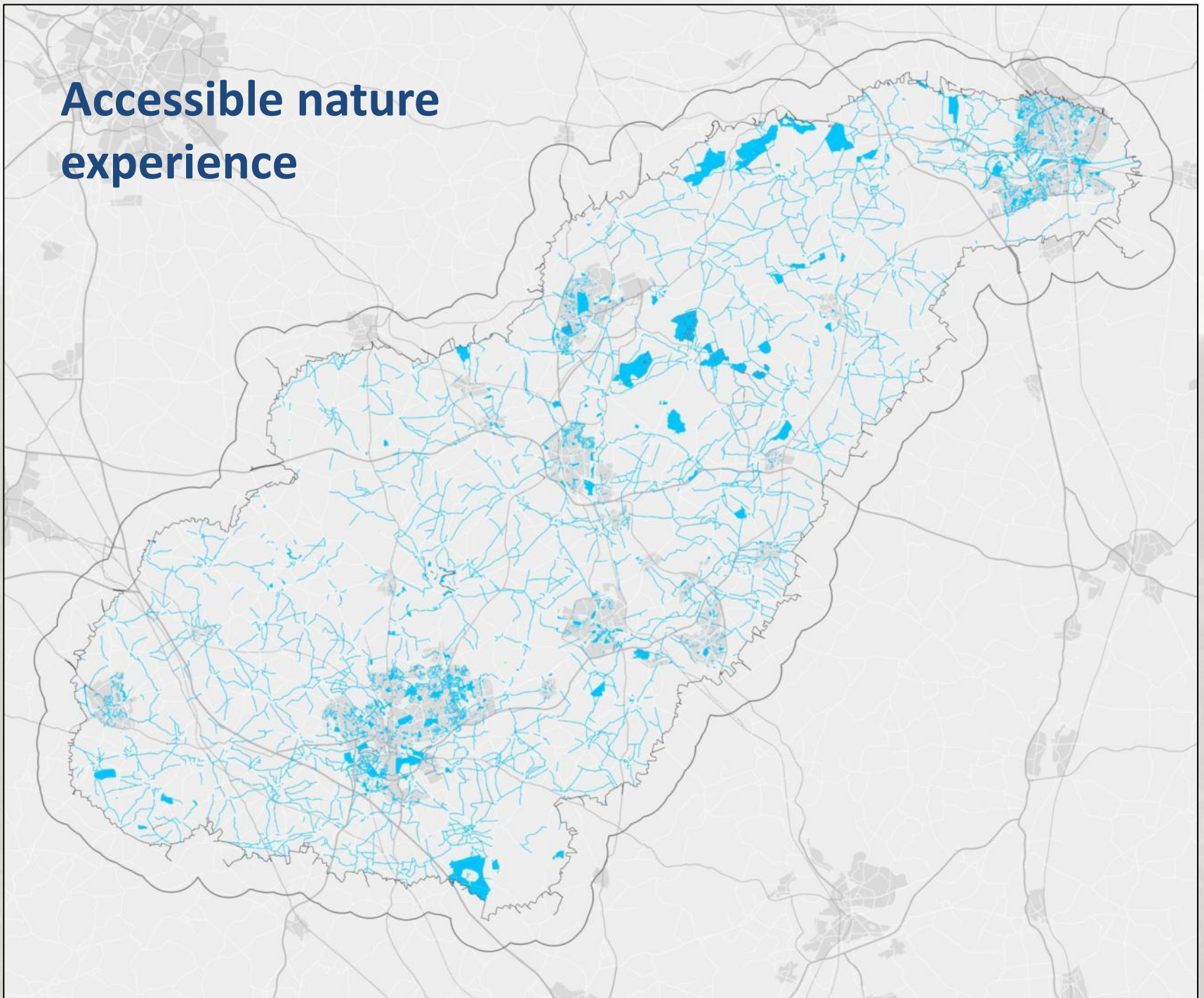
April 2014



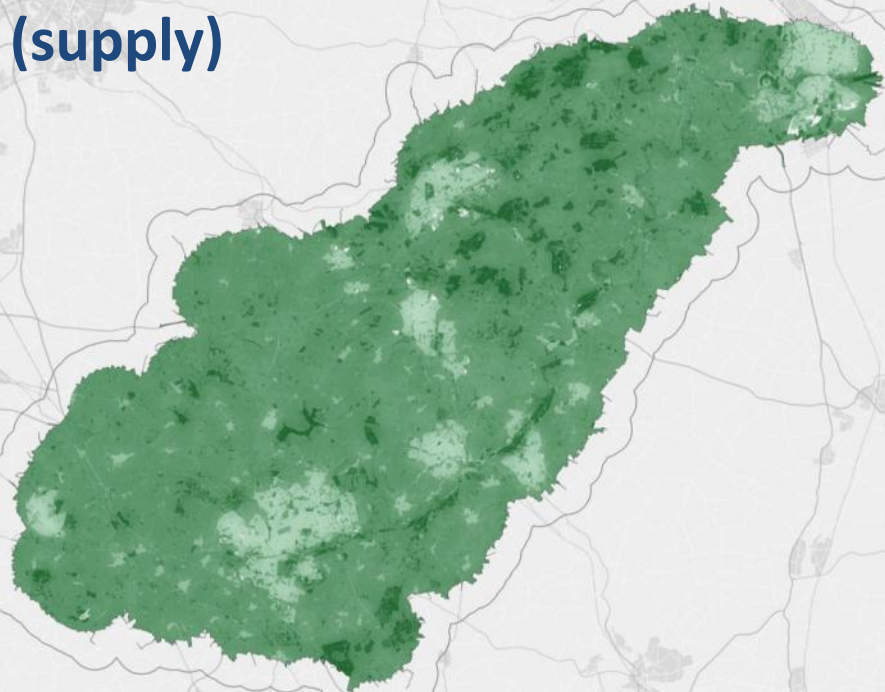
Nene Valley NIA basemap



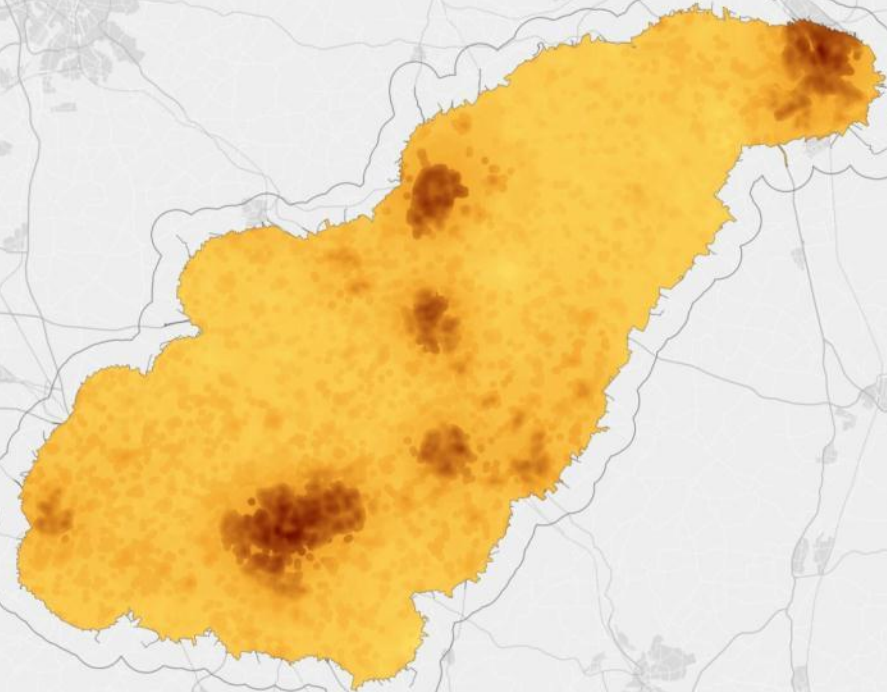
Accessible nature experience



Capacity (supply)



Demand



Accessible Nature Capacity

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Legend
Study Area
Study Area Buffer
Accessible Nature Capacity
High : 100
Low : 0



0 16.5 Kilometers

Accessible Nature Demand

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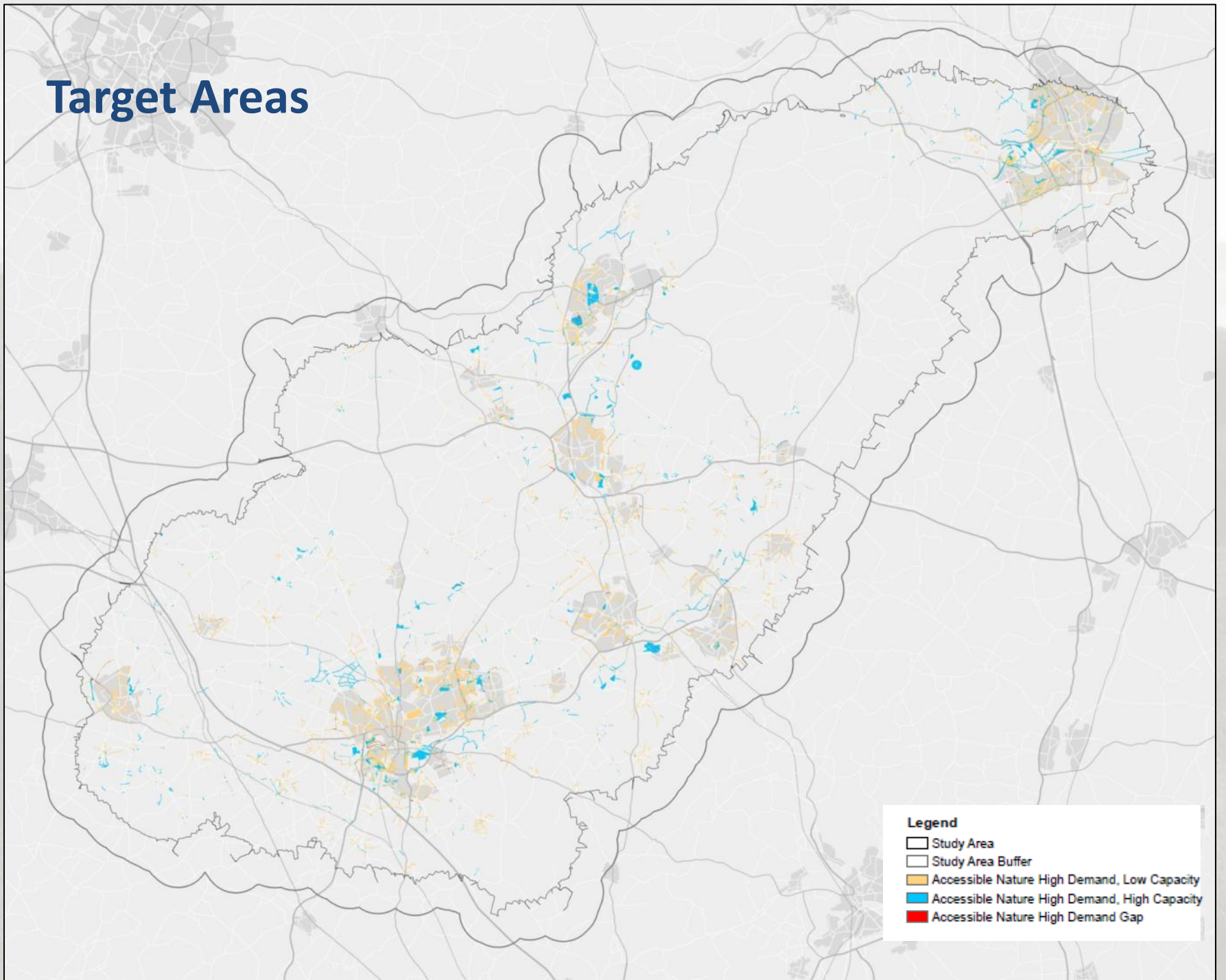


Legend
Study Area
Study Area Buffer
Accessible Nature Demand
High : 100
Low : 0

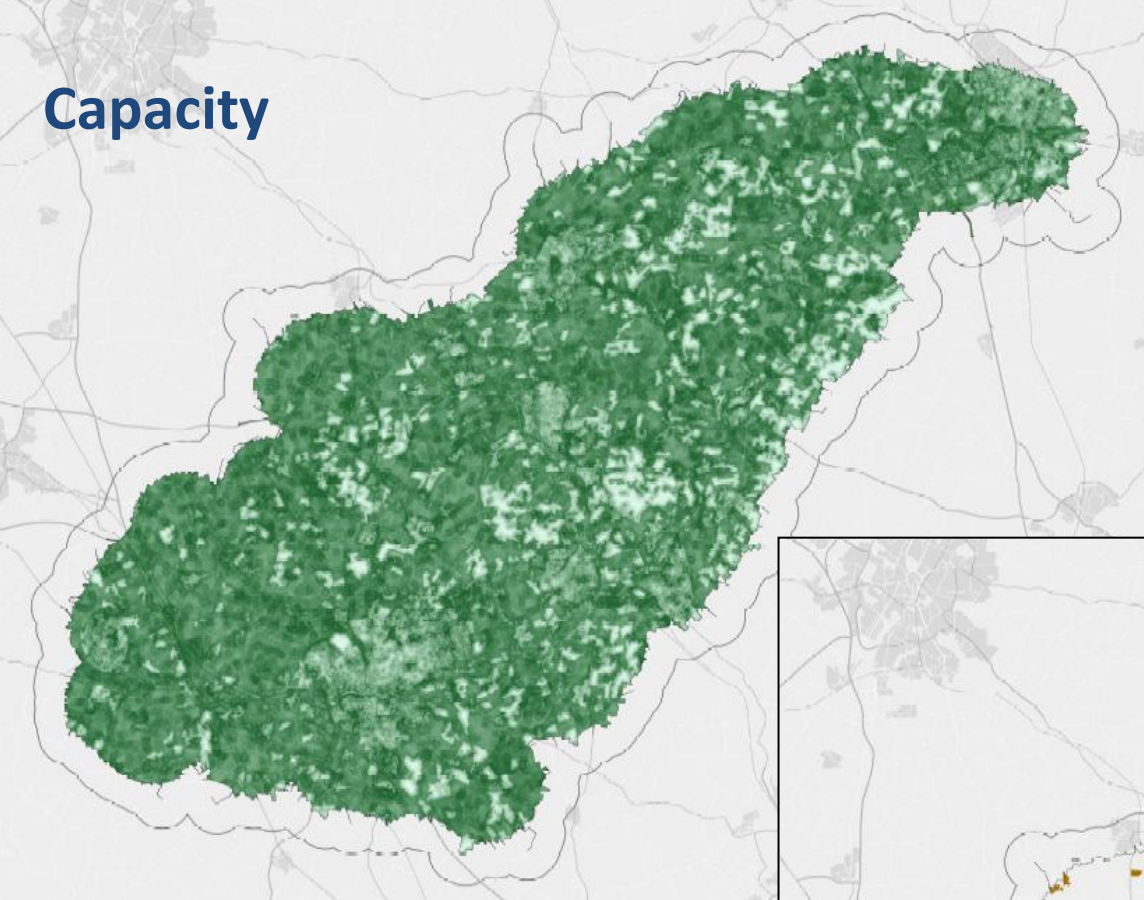


0 16.5 Kilometers

Target Areas



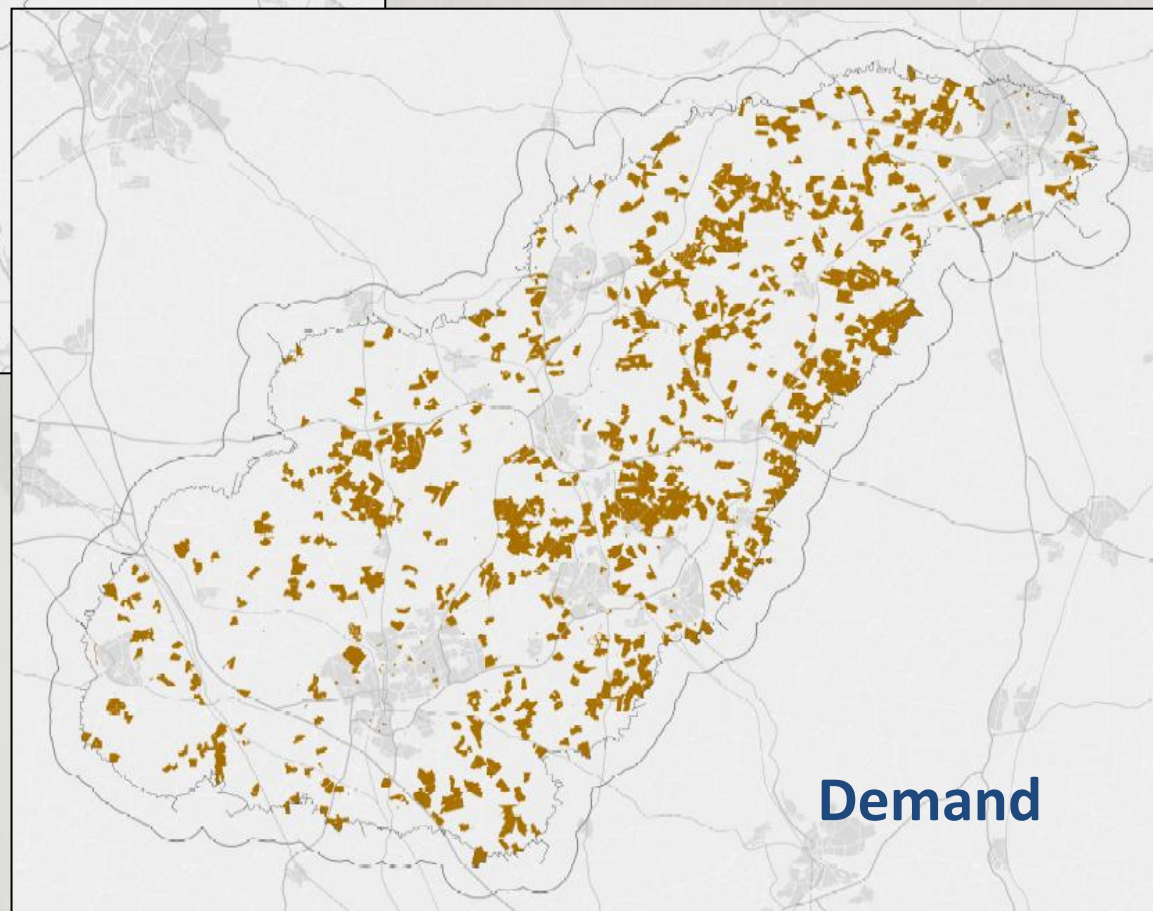
Capacity



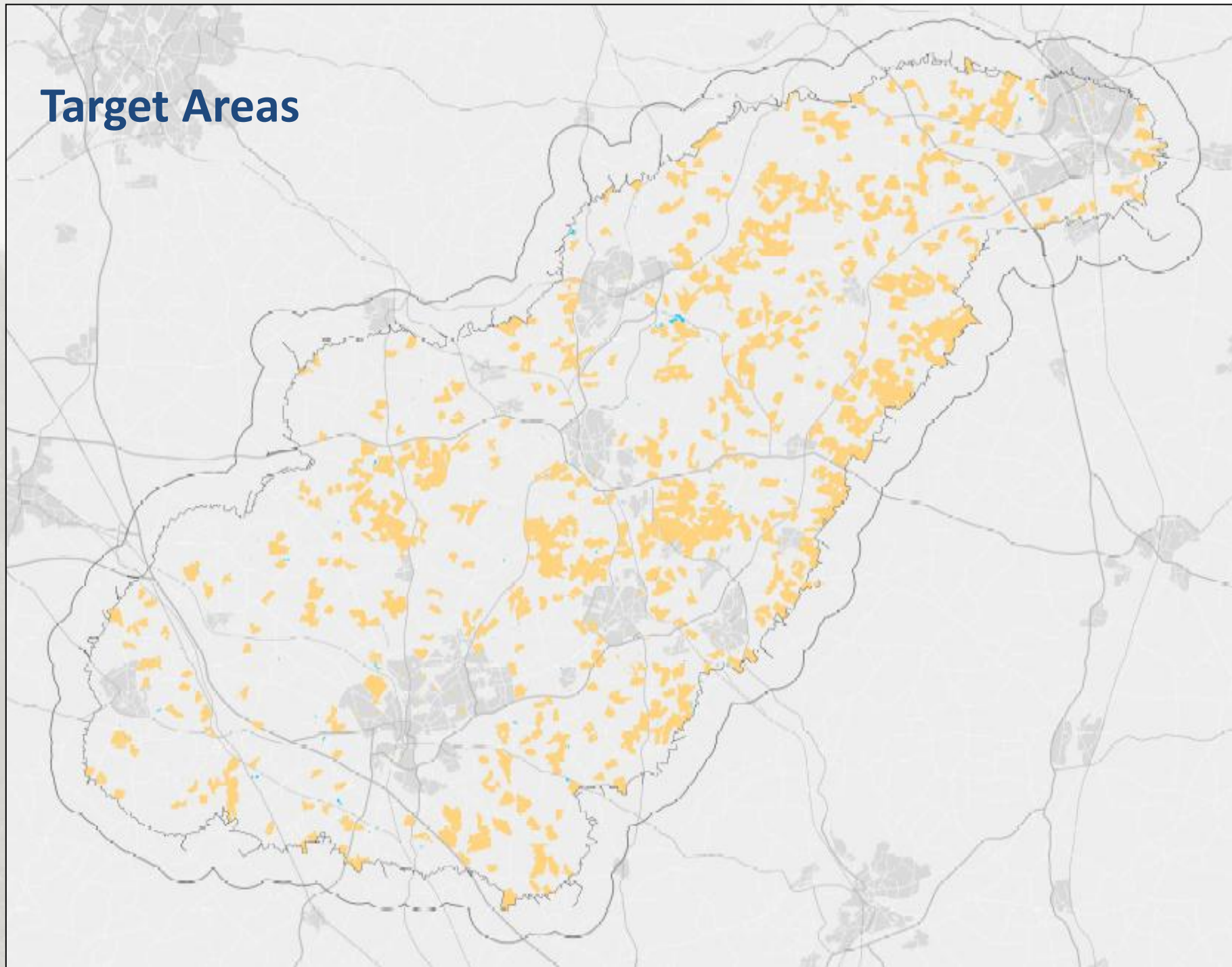
Pollination



Demand

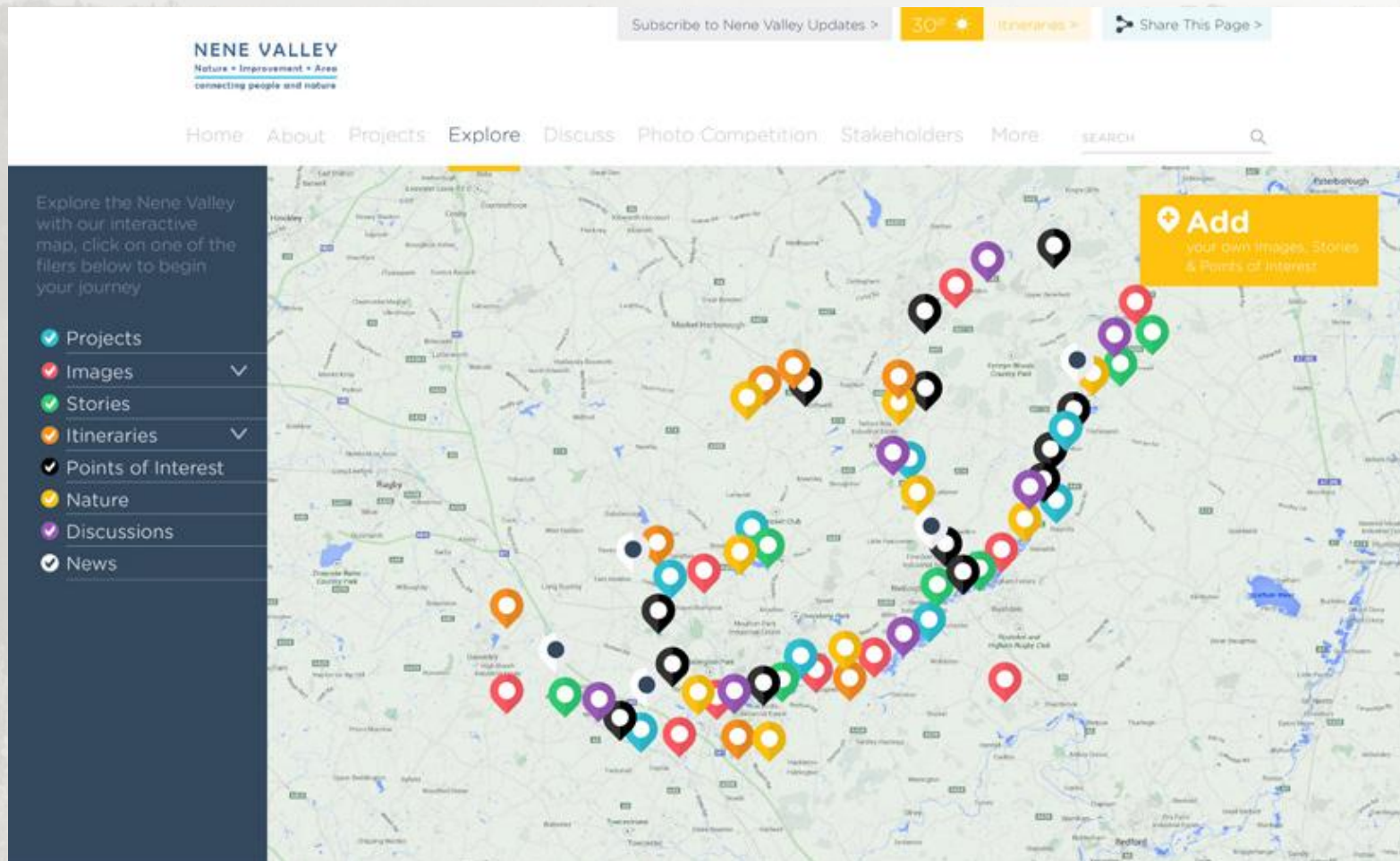


Target Areas



Public participatory mapping

- Website being built to encourage members of the public to map the parts of the Nene Valley that they value – the cultural ecosystem services
- Opportunity to add photos, comments and will collect contextual info about the person





Mapping biodiversity

Biodiversity records

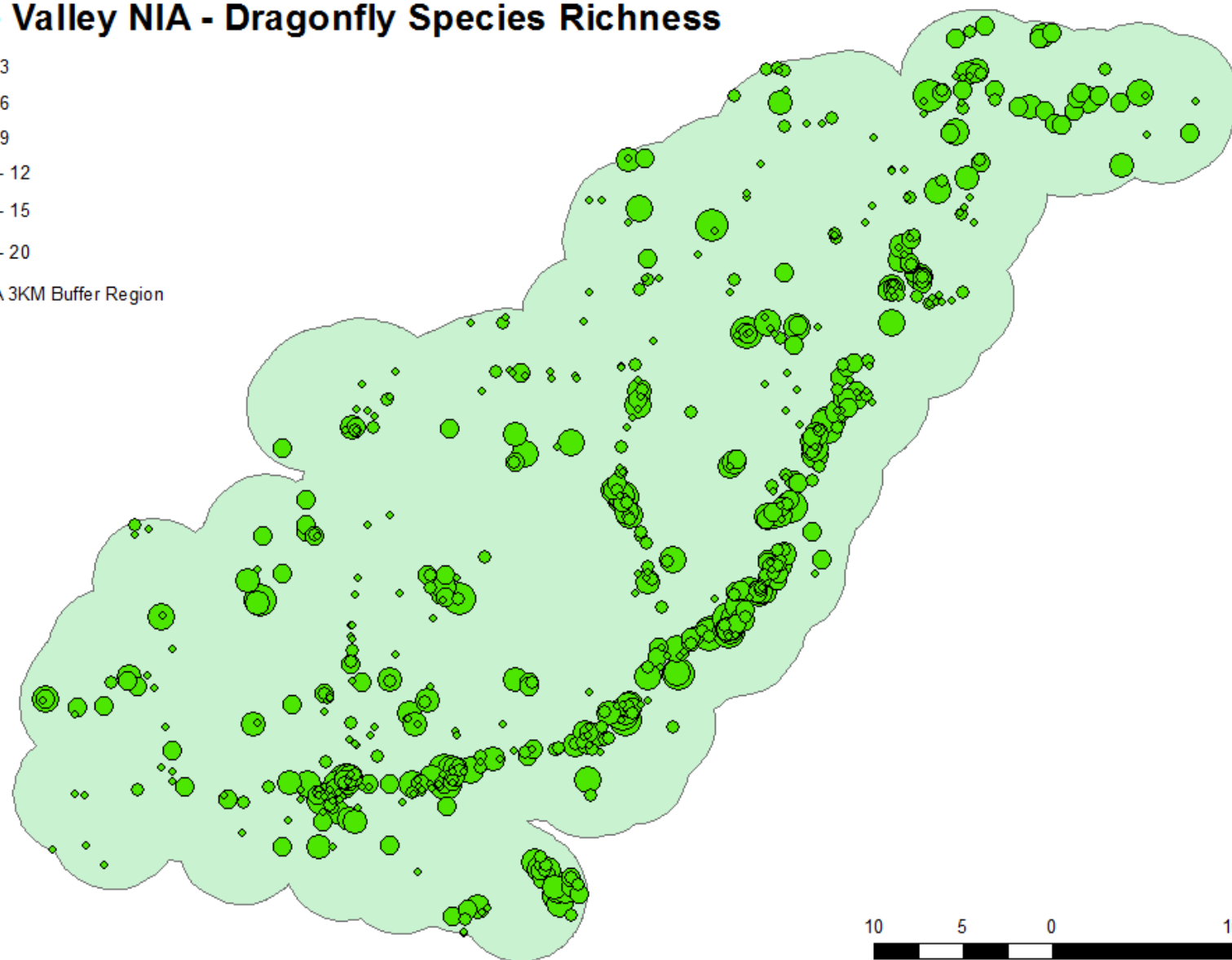
Taxa	Number of records
Plants	43,753
Fish	36,823
Butterflies	75,950
Moths	120,291
Dragonflies	16,444
Bees & wasps	1,615
Syrphidae	4,679
Birds	Pending
Bats	No access
GRAND TOTAL	299,555



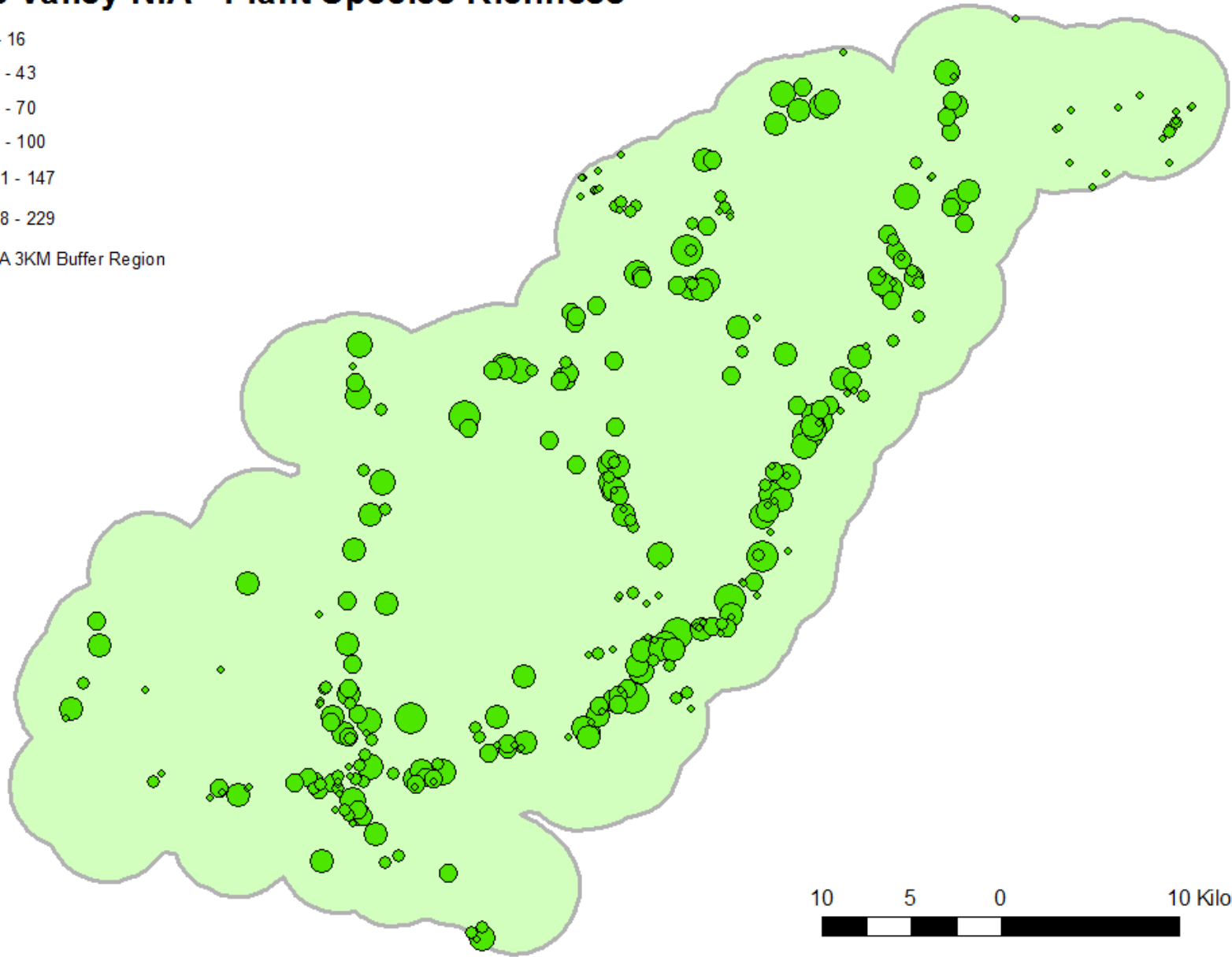
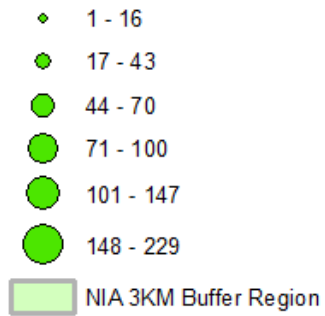
Nene Valley NIA - Dragonfly Species Richness

- 0 - 3
- 4 - 6
- 7 - 9
- 10 - 12
- 13 - 15
- 16 - 20

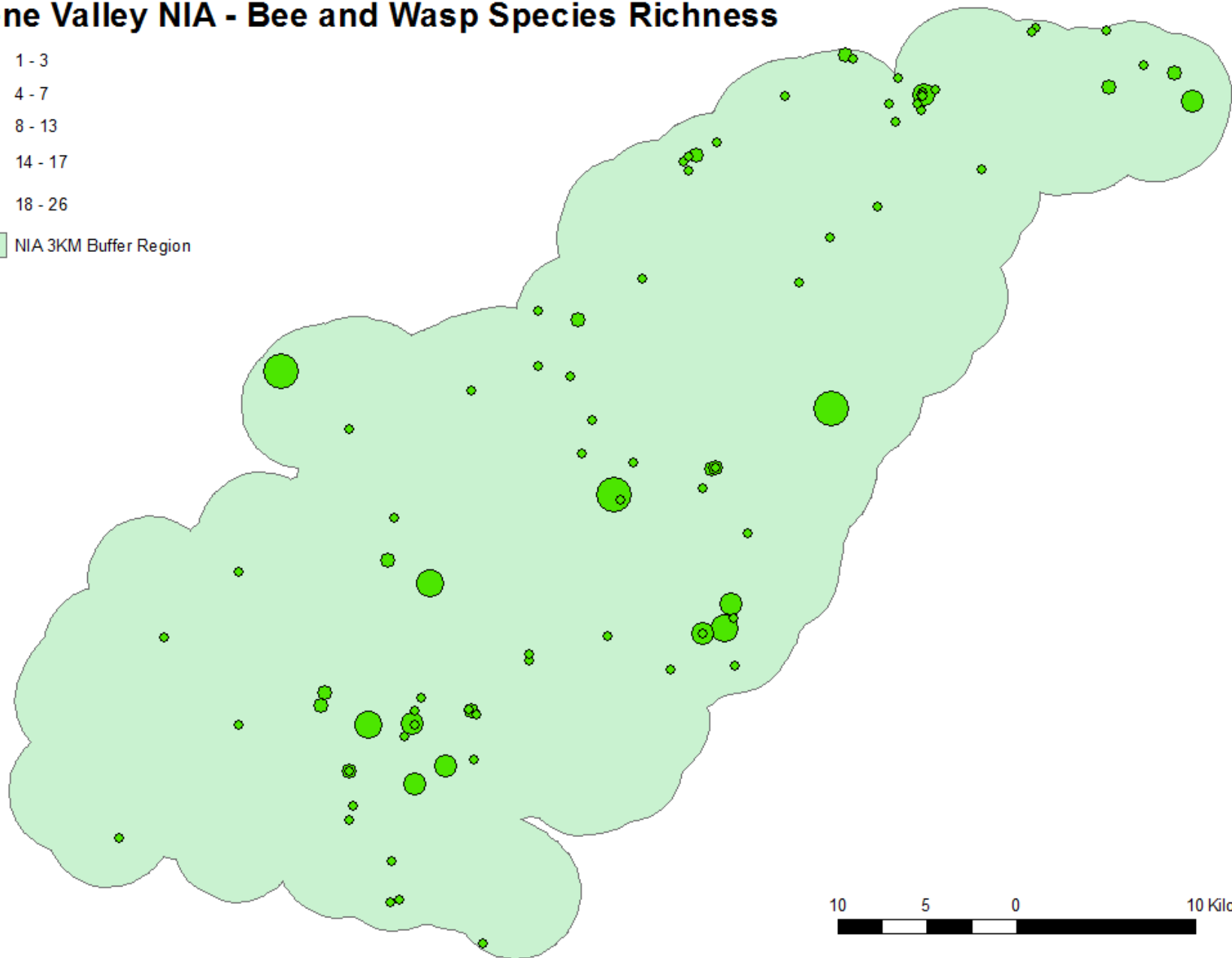
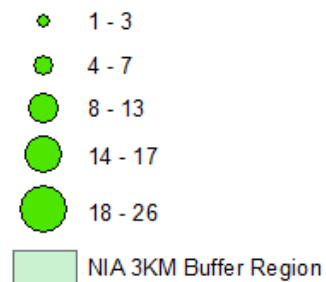
NIA 3KM Buffer Region



Nene Valley NIA - Plant Species Richness



Nene Valley NIA - Bee and Wasp Species Richness

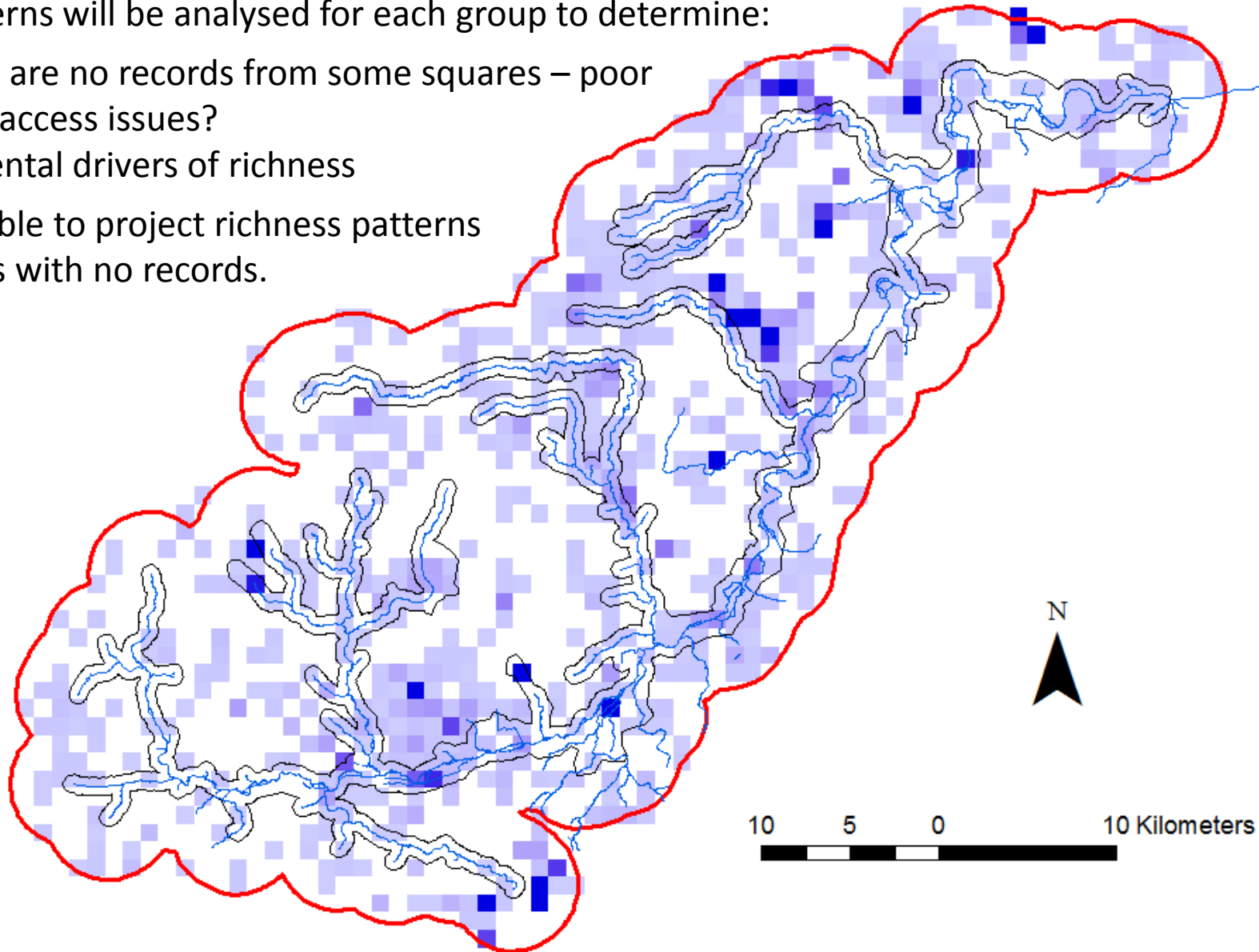


Nene Valley NIA – Butterfly records in 1 km squares

Richness patterns will be analysed for each group to determine:

1. Why there are no records from some squares – poor habitat or access issues?
2. Environmental drivers of richness

Will then be able to project richness patterns across squares with no records.



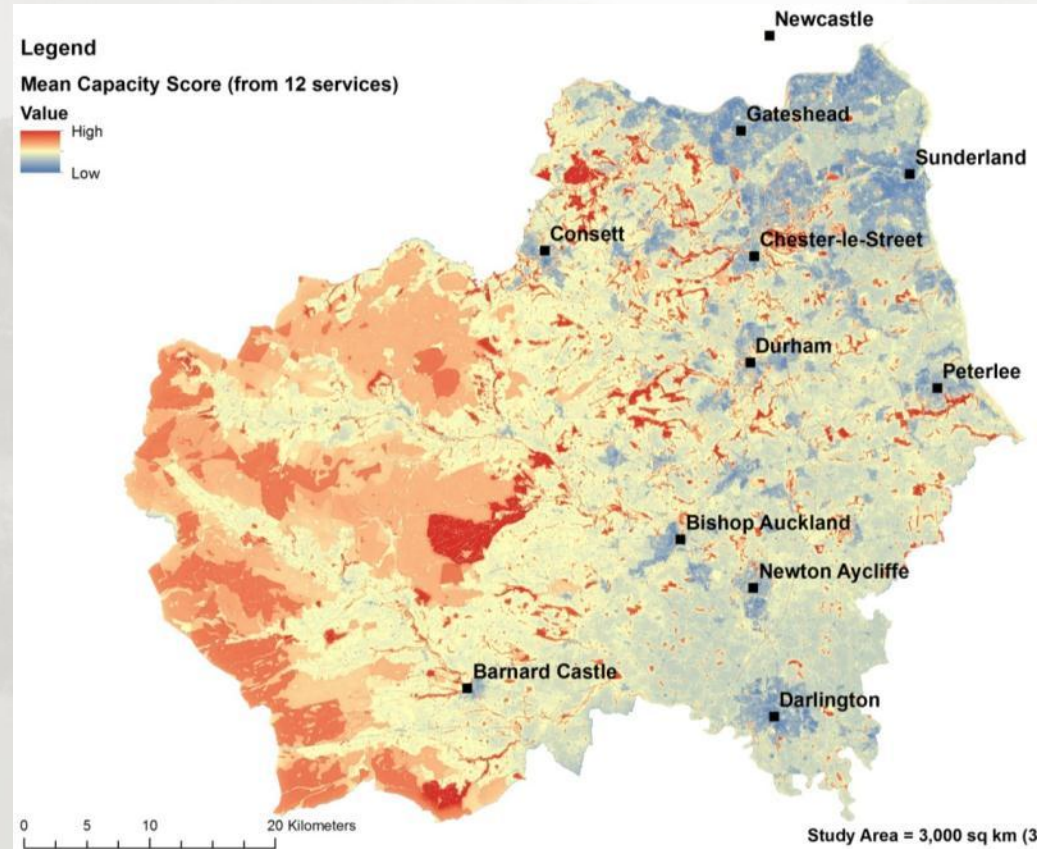


Applying the results for biodiversity conservation

What can we do with this biodiversity and ecosystem services information?

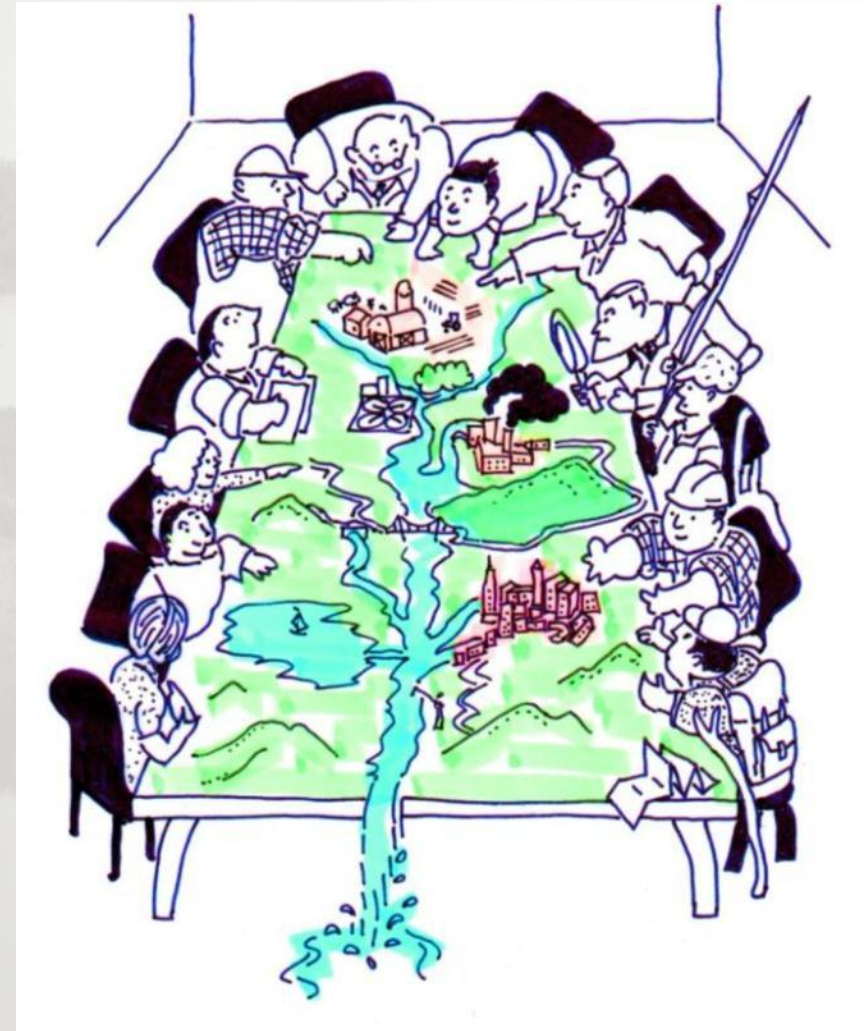
- Co-occurrence of multiple ES
- Links between biodiversity and ES
- Trade-off's and synergies

- Targeting
 - Areas to conserve / protect
 - Areas to manage better or restore
- Scenario modelling
- Ecosystem markets and PES



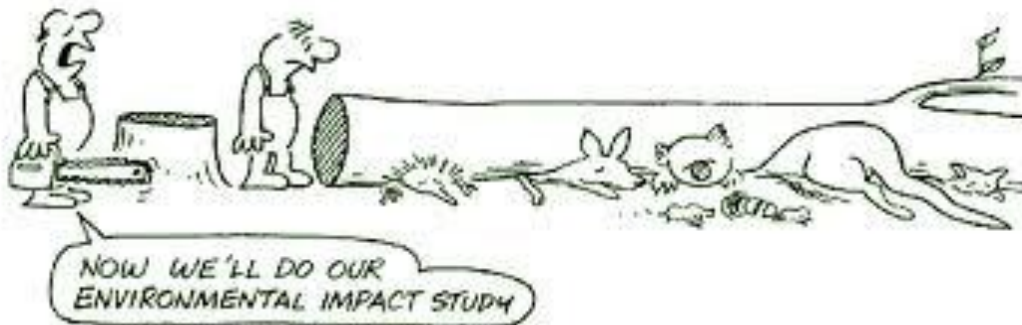
Some applications of ecosystem service mapping

1. Informing dialogue with stakeholders
 - Engage with stakeholders to produce locally relevant list of potential projects
 - Develop possible Payments for Ecosystem Services (PES) schemes



Some applications of ecosystem service mapping

1. Informing dialogue with stakeholders
2. Influencing planning policy and planning gain
 - ES design guide for planners and developers
 - Influence local plans and strategies
 - Section 106 agreements & Community Infrastructure Levy (CIL)



Some applications of ecosystem service mapping

1. Informing dialogue with stakeholders
2. Influencing planning policy and planning gain
3. Agri-environment scheme targeting
 - AE schemes are “PES-like”
 - New scheme will be targeted and at the landscape scale
 - May involve greater range of ES
 - Natural England and Defra developing ideas about how to target but biodiversity and ES maps could be highly informative

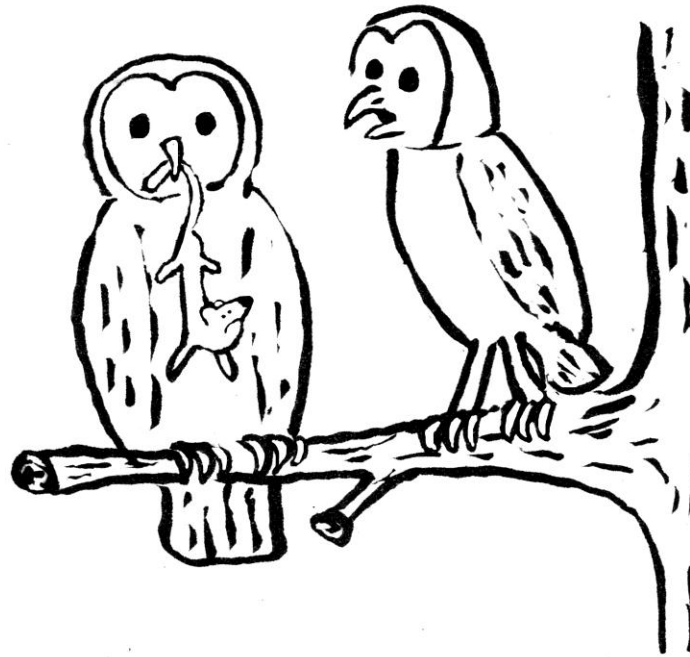


Some applications of ecosystem service mapping

1. Informing dialogue with stakeholders
2. Influencing planning policy and planning gain
3. Agri-environment scheme targeting
4. Biodiversity and carbon offsetting
 - Biodiversity and ES mapping can be used to determine the best locations for offsetting projects



"YOU CAN'T EAT HIM DAVE, HE'S
WORTH £4.37 TO THE LOCAL ECONOMY"



@CartoonRalph

Thank You!

Jim.Rouquette@northampton.ac.uk