



Bedfordshire LNRS Blue Lens: intervention opportunities prioritisation workshop

Dr Alison Holt and Natalie Johnson Natural Capital Solutions

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Agenda

10.00 **Introduction** - The Blue Lens project, incorporating the water environment into the Beds LNRS.

10.15 **Needs** - Outline of the needs for the water environment followed by a brief discussion.

10.30 **Opportunities** - Presentation of the Beds Blue Lens opportunity maps. How the data can be used by neighbouring LNRSs and discussion.

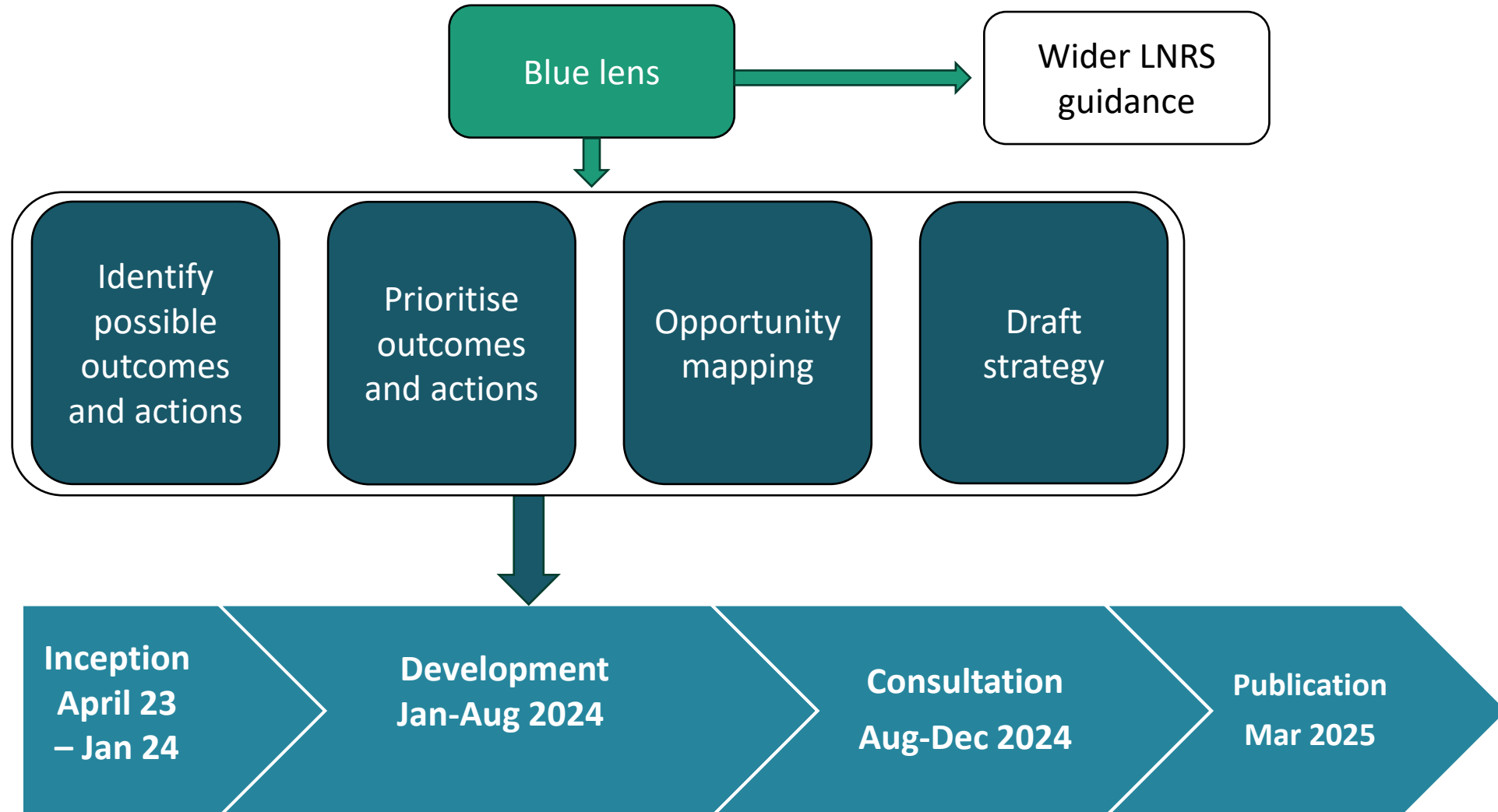
11.15-11.30 Break

11.30 **Prioritisation of opportunities** - Break out groups.

12.00 **Report back** - Break out groups report back and whole group discussion about findings.

12.15-12.30 **Main messages from the workshop** - Wrap up and close

Bedfordshire LNRS - Indicative timeline

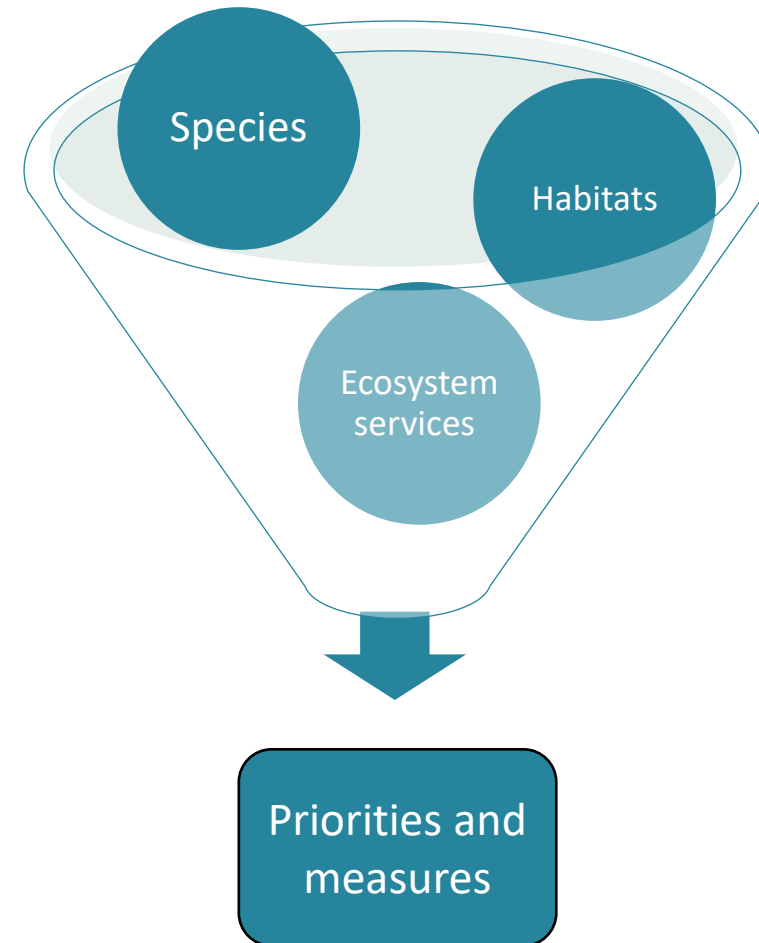


Identifying our outcomes and actions



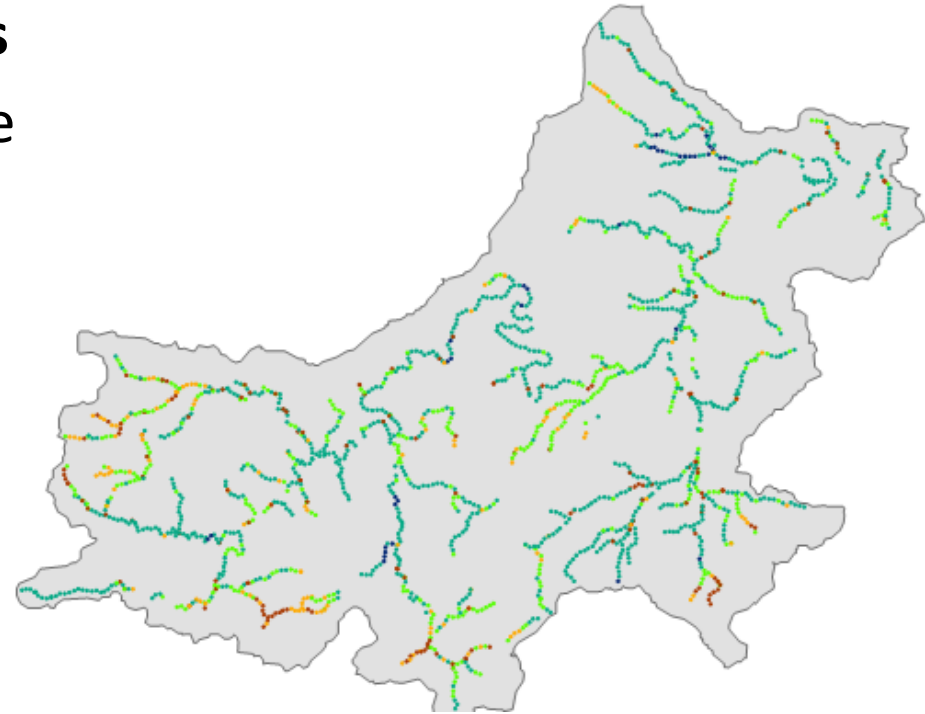
Outcomes: the end results that the strategy is seeking to achieve.

Actions: specific practical actions to achieve priorities

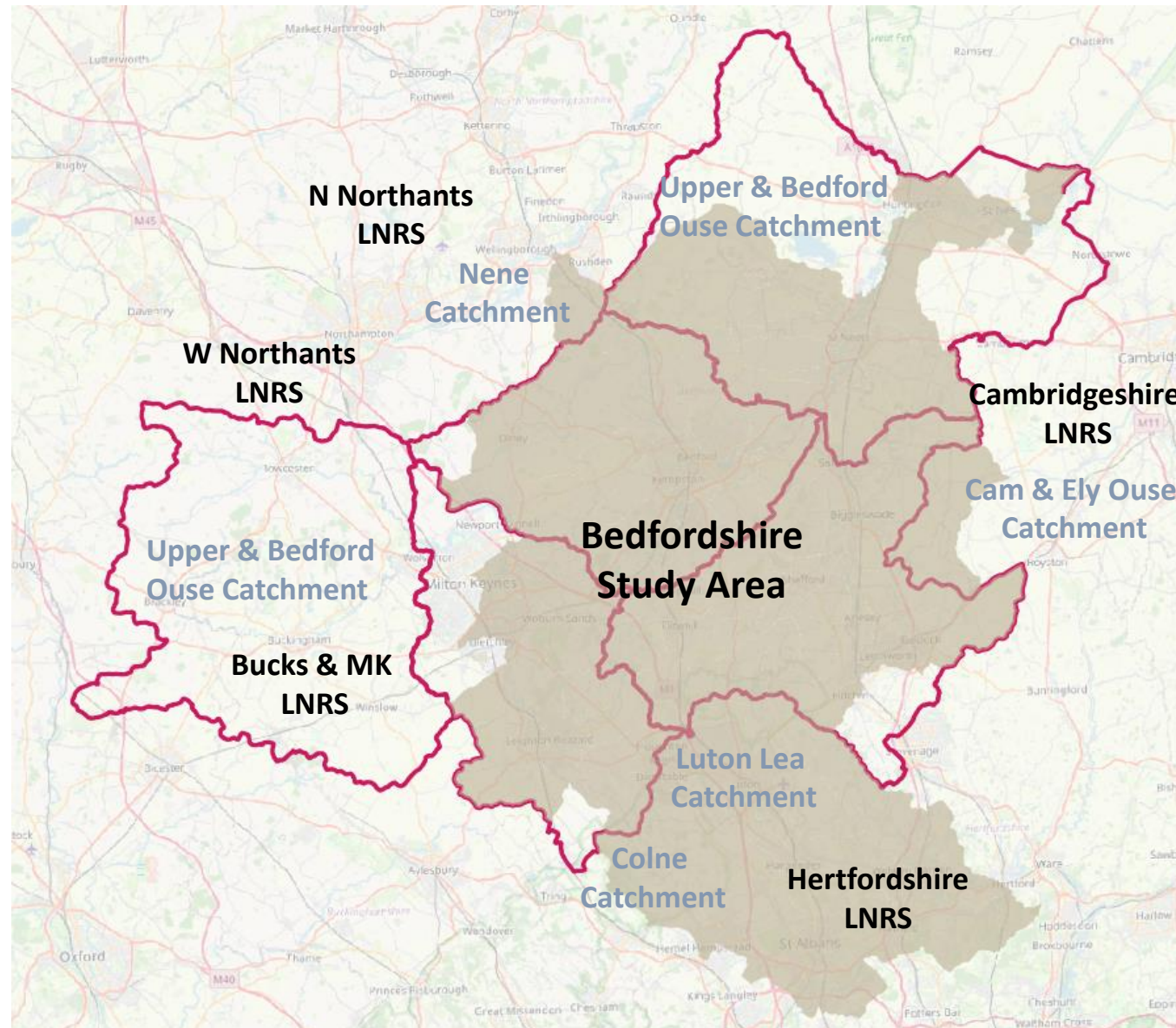


Why have a 'Blue Lens'?

- Make **best use** of **water-related datasets**
- Identify opportunities for **recovery** of the **water environment**
- Support **LNRS Priority-setting** and proposed **Measures**
- Inform **mapping** of Measures
- Support **cross-boundary** working
- All feeding into Beds LNRS in '**real time**'
- Demonstrate '**added value**' of approach (not replacing key stakeholder input)



Geographies





Prioritised needs and interventions

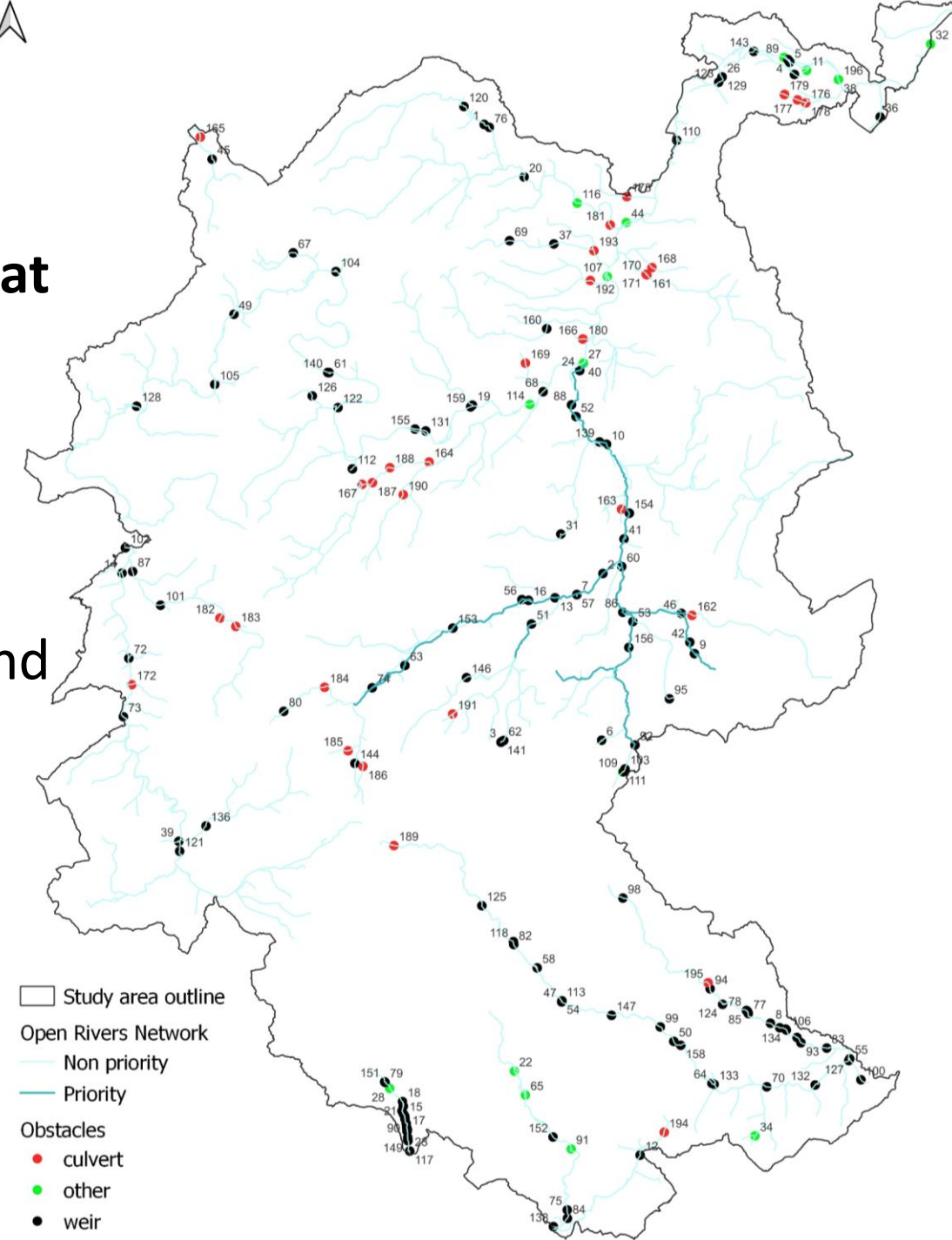
Prioritised needs

1. Improved geomorphology, in channel habitat and connectivity
2. Reducing nutrient pollution
3. Flow regulation (high and low flows)
4. Reversing wetland and peat degradation and loss



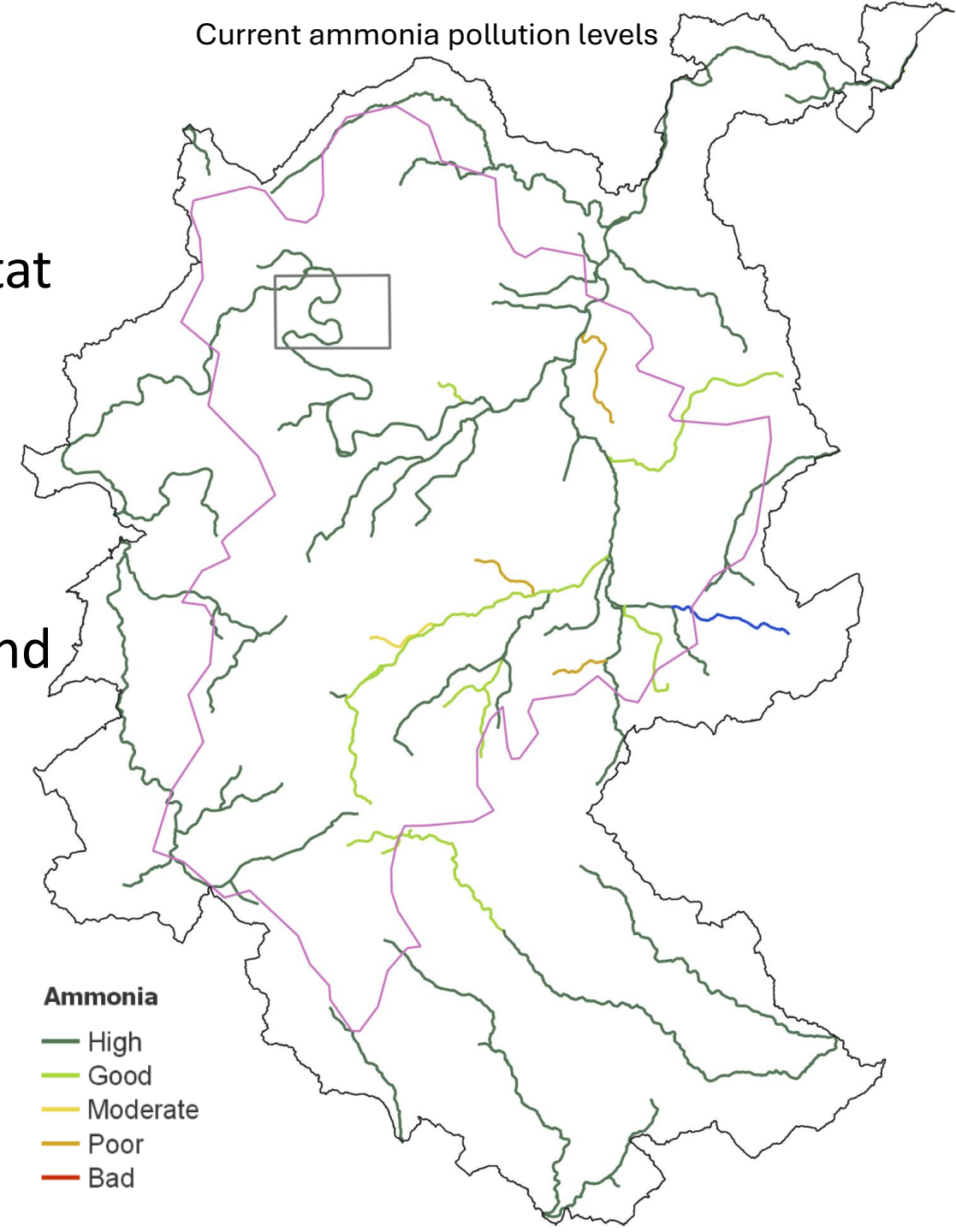
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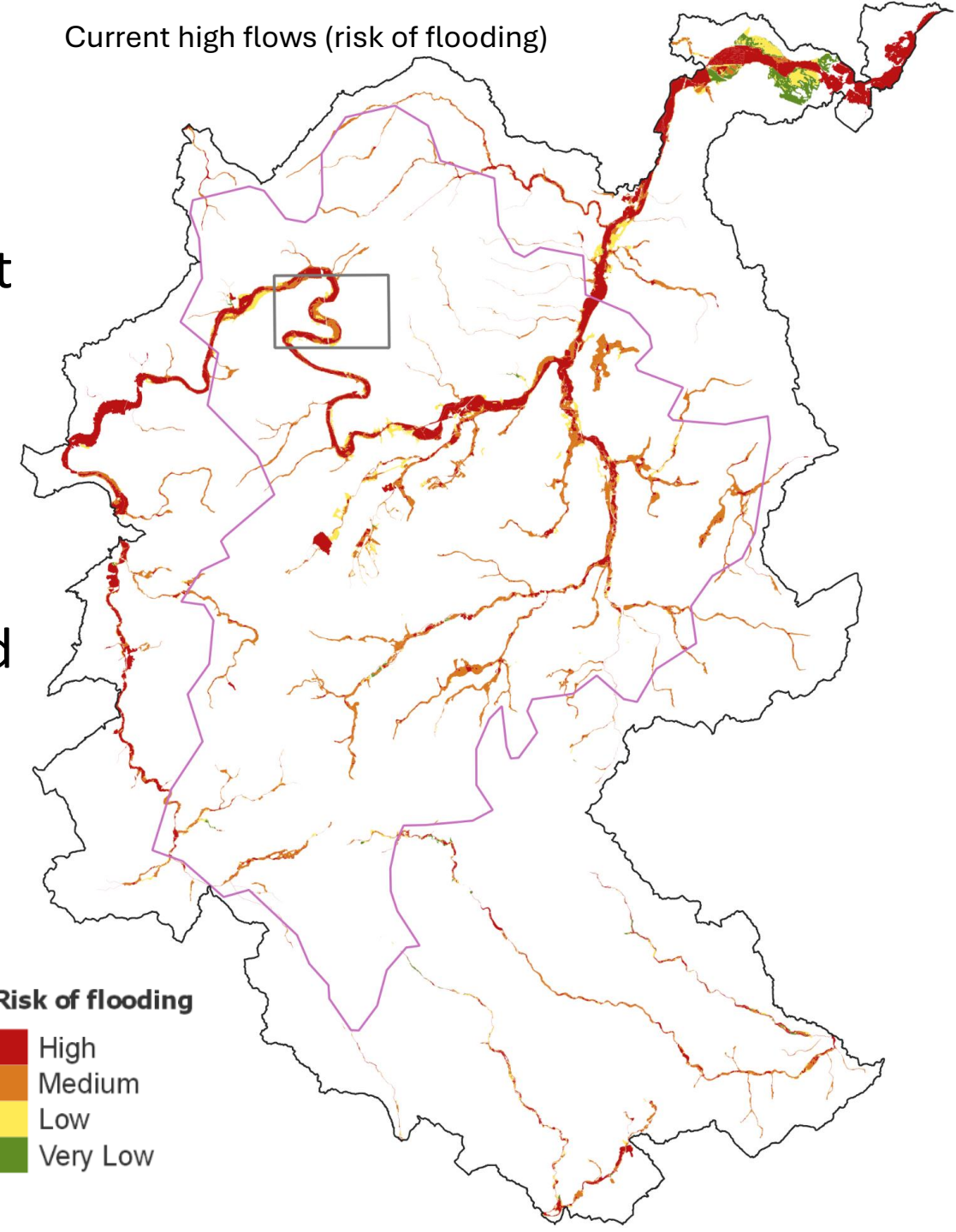
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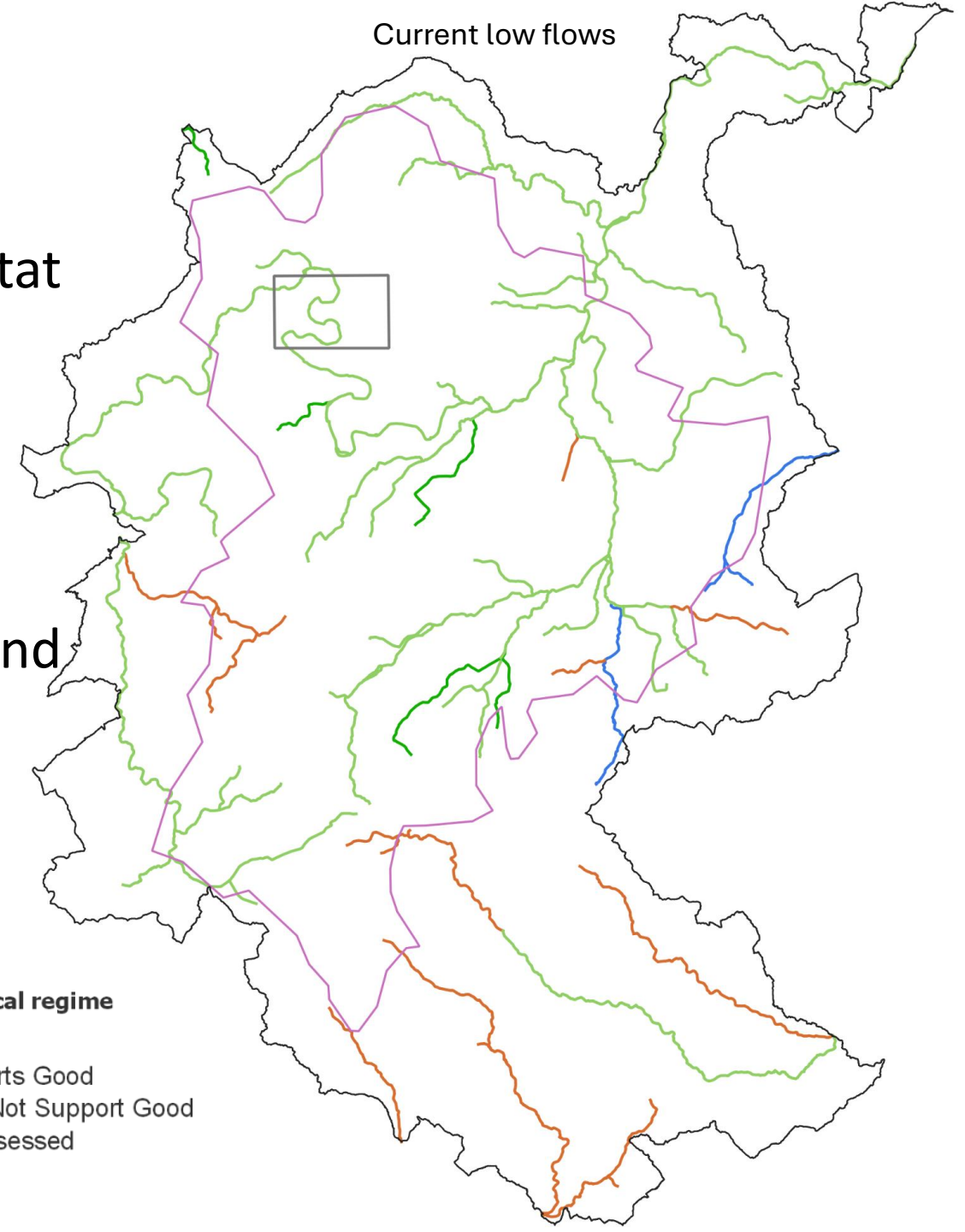
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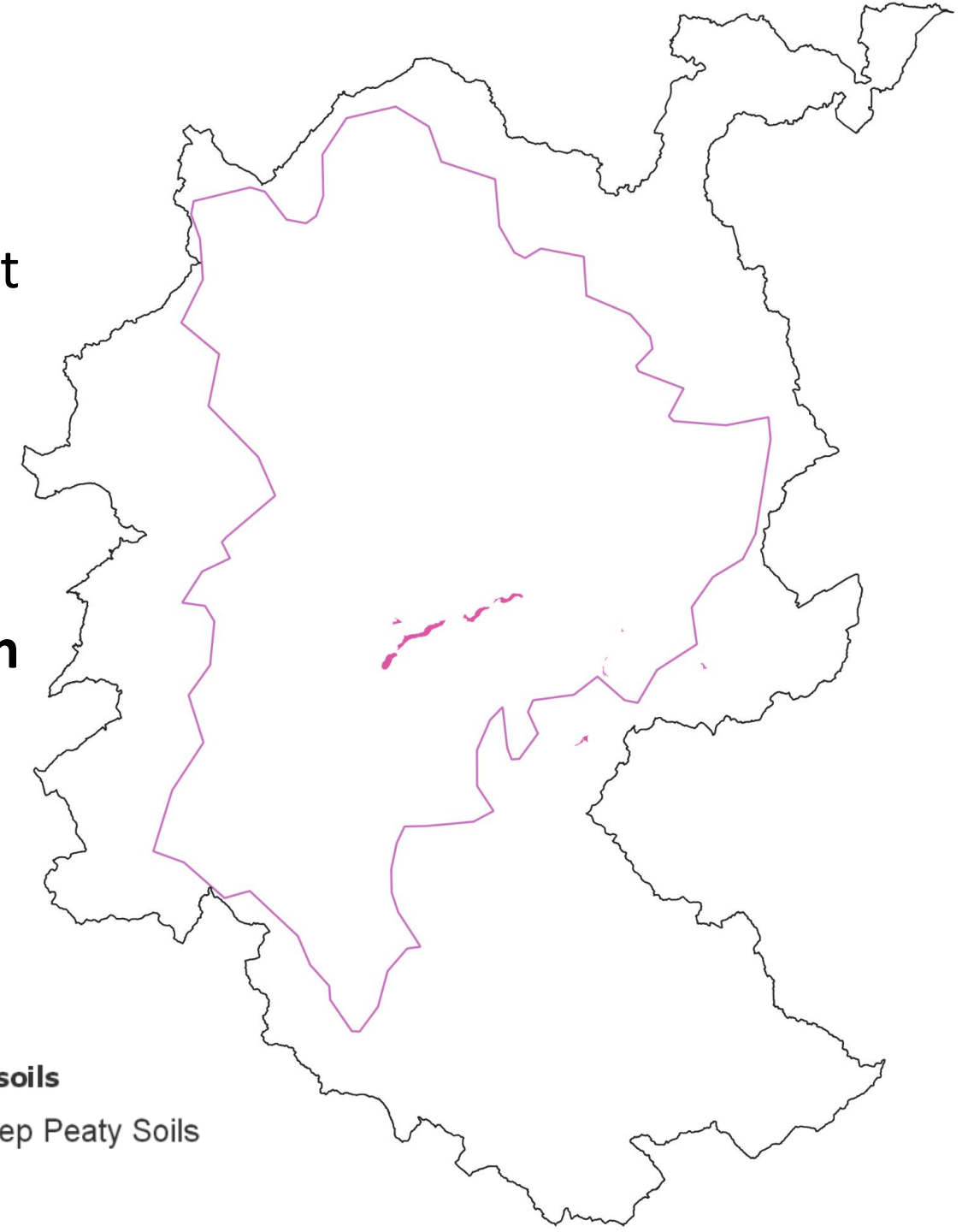
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Prioritised needs

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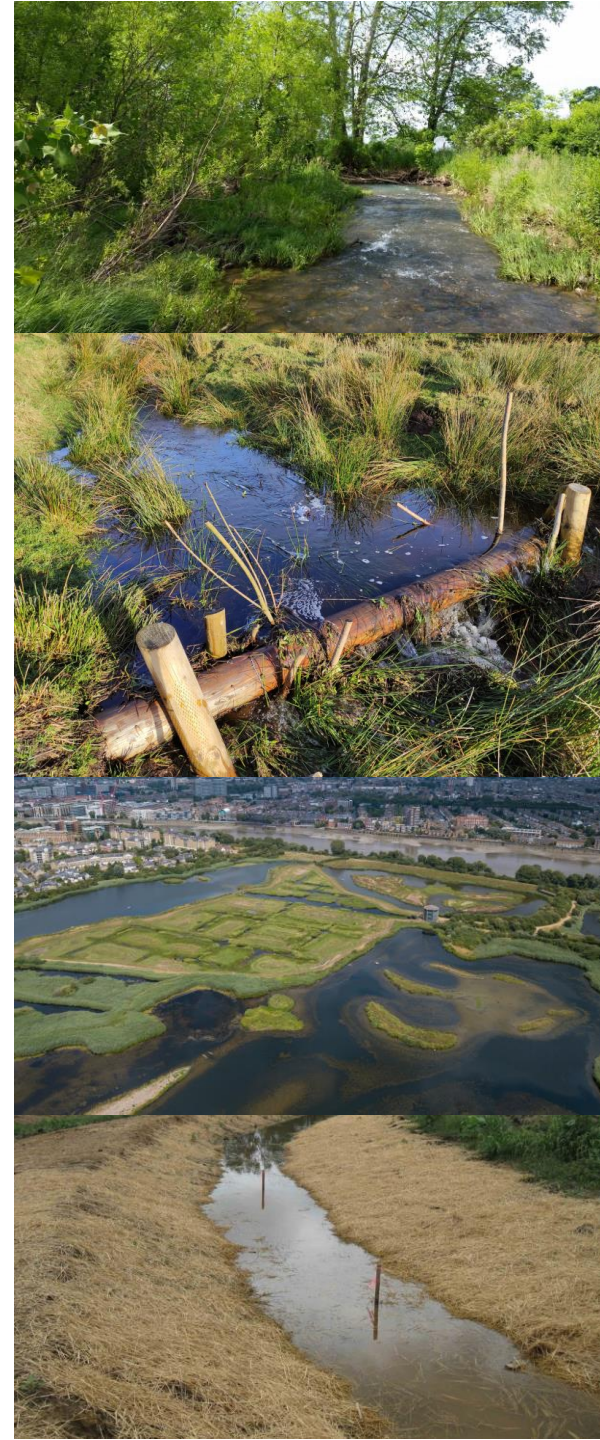


Peaty soils

Deep Peaty Soils

Measures and interventions

- Lowland peat/wetland/floodplain restoration
- Riparian and floodplain woodland
- Floodplain reconnection
- River restoration
- Buffer Strips
- Contour swales
- Leaky barriers





Opportunities

Mapping opportunities - methods

- Hydromorphological and pressure condition mapping
- Connectivity mapping
- HydroloGIS
- Leaky dams analysis
- Habitat opportunity mapping

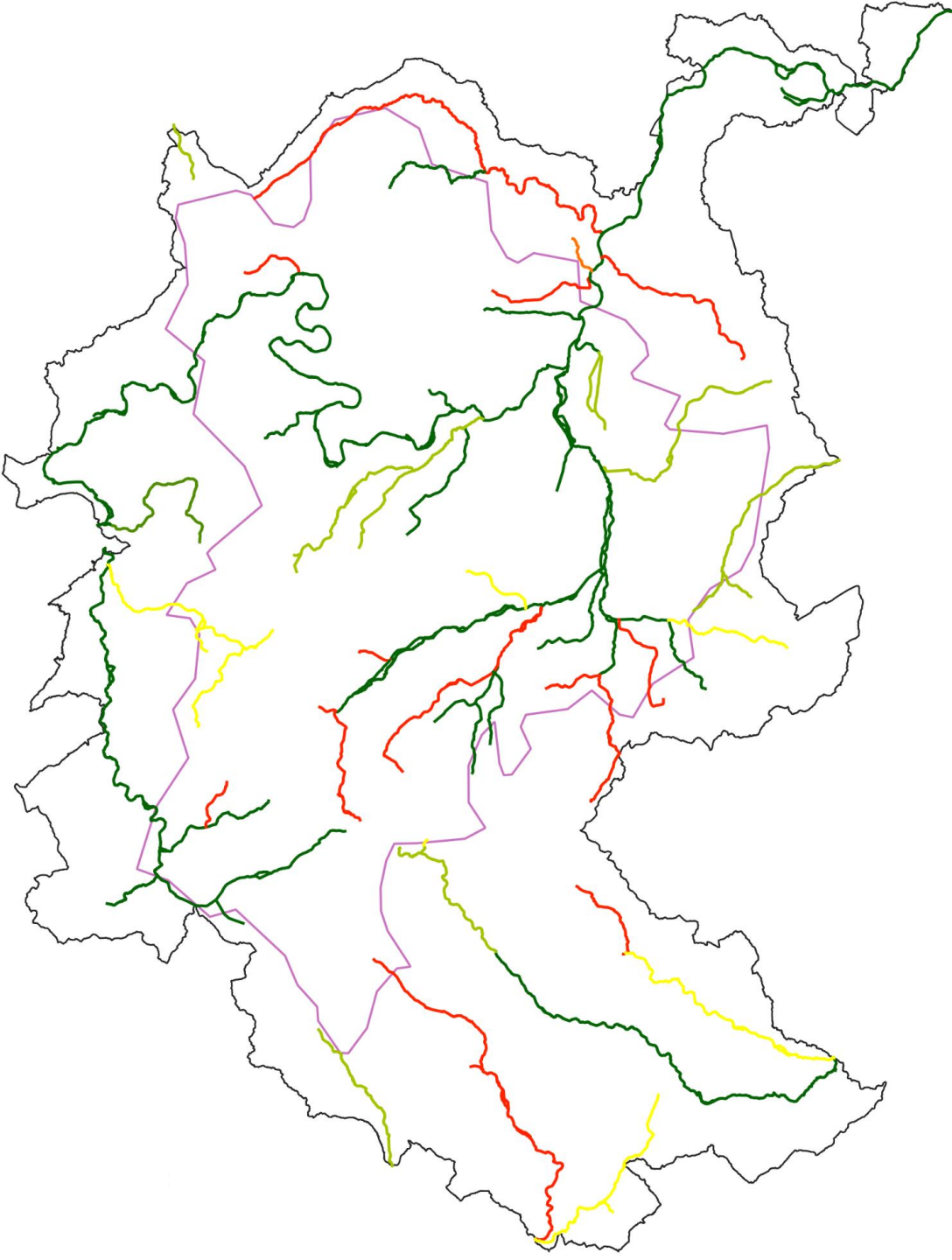


Hydromorphological and pressure condition mapping

- Prioritise the Bedfordshire rivers by their need for restoration
- The Hydromorphological Pressure and Condition (HPC) index:
 - level of river modification
 - flow regime
 - erosion and deposition features, riffles and pools
 - habitat quality channel substrate
 - channel vegetation structure
 - number of occurrences of bank and channel modification

Meets need 1. Improved geomorphology, in channel habitat and connectivity

Prioritised river restoration



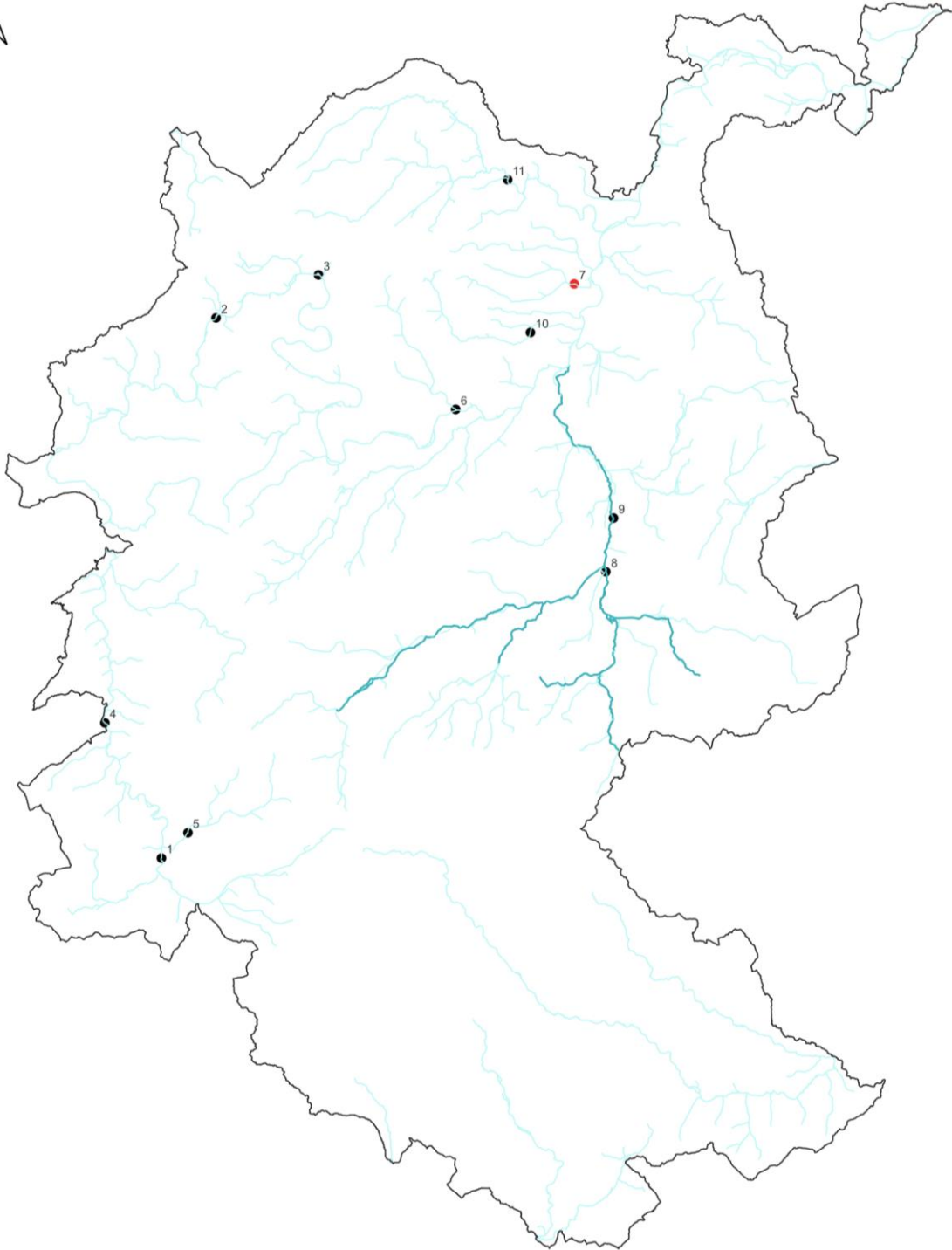
Priority for river restoration

- 1
- 2
- 3
- 4
- 5
- 6
- 7

River obstacles mapping

- Prioritise obstacle removal by which opens up the largest additional river stretch
- Calculated the length of the two river stretches on either side of the obstacle and the combined length of the two river stretches minus the longest stretch was the additional length of river opened up by its removal
- The analysis was run for all river stretches in the study area, and where brown trout are present in Bedfordshire

Meets need 1. Improved geomorphology, in channel habitat and connectivity



Connectivity analysis: study area

Obstacle number	Total length of stretch (km)	Brown trout	Obstacle type	Length added (km)
1	66.82	No	weir	32.9
2	86.19	No	weir	19.18
3	37.18	No	weir	18.01
4	49.88	No	weir	16.99
5	49.6	No	weir	16.7
6	45.81	No	weir	16.34
7	43.52	No	culvert	15.71
8	30.36	Yes	weir	13.05
9	64.1	Yes	weir	13.05
10	51.07	No	weir	12.85
11	52.71	No	weir	12.84

Open Rivers Network

Non priority

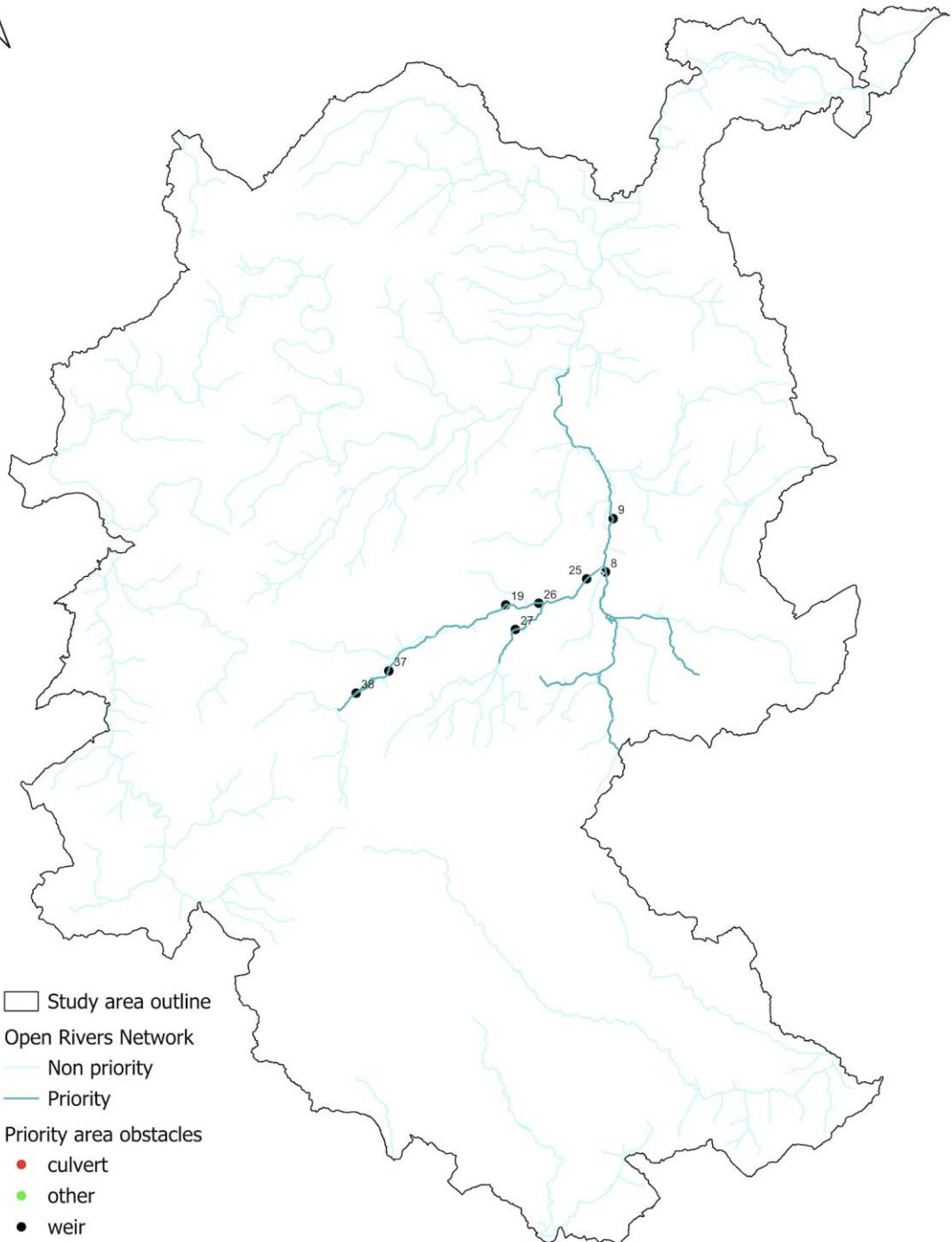
Priority

Obstacles

culvert

other

weir



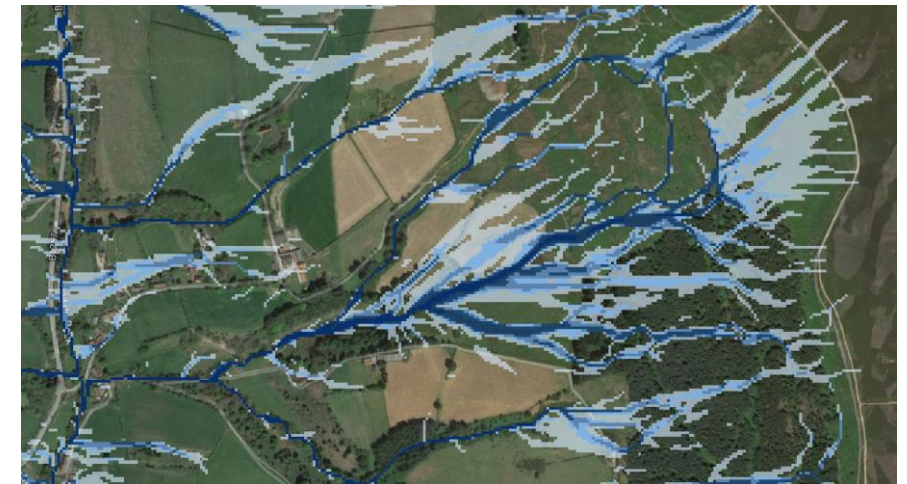
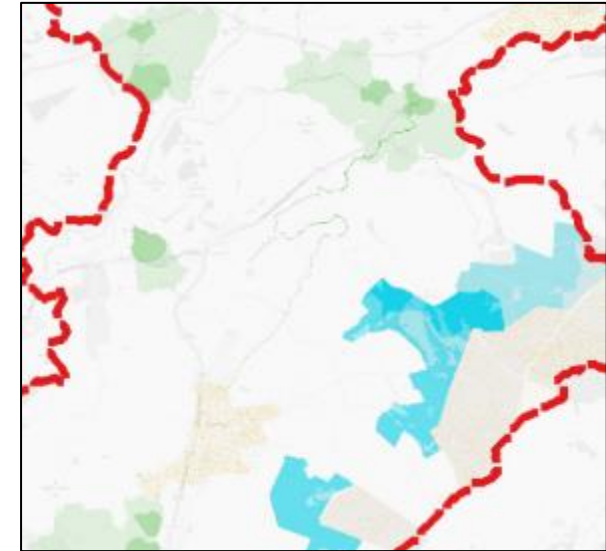
Connectivity analysis: brown trout areas

Obstacle number	Total stretch length (km)	Obstacle type	Length added (km)
8	30.36	weir	13.05
9	64.1	weir	13.05
19	33.18	weir	7.61
25	20.38	weir	7.33
26	14.94	weir	7.33
27	37.72	weir	7.33
37	30.73	weir	5.16
38	16.65	weir	5.16

HydroloGIS

Hydrological modelling prioritising NbS for dealing with flooding, erosion/siltation and diffuse pollution. 10m resolution. Ranked for impact on local problems.

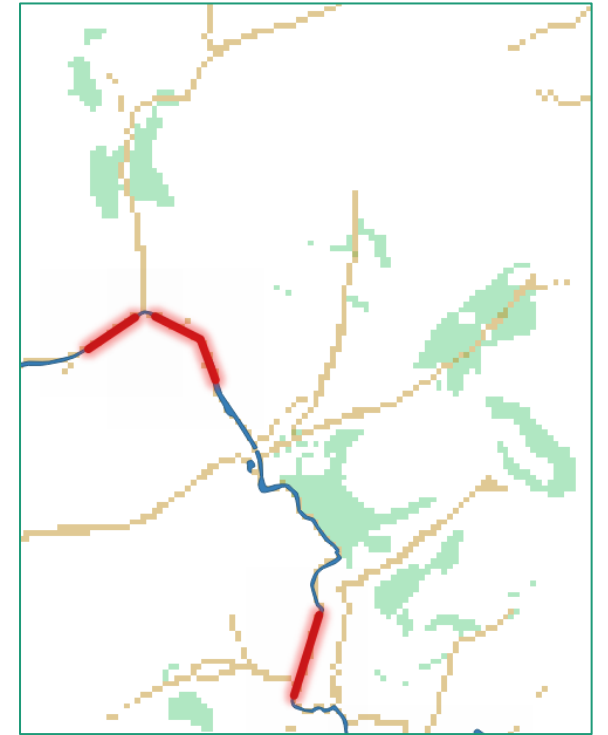
- **Current landscape function**
- **Prioritised catchment solutions**
woodland, semi-natural grassland water retention
- **Overland flows and depressions**
- **Prioritised NbS**
Specific interventions e.g. riparian and floodplain woodland, wetland scrapes and ponds, buffer strips, bunds and swales



Meets needs 2. Reducing nutrient pollution, 3. Flow regulation (high and low flows), & 4. Reversing wetland and peat degradation and loss

Leaky dams analysis

- Best locations for leaky dam placement: priority solutions for flooding on or close to a watercourse and where major flows enter the watercourses from more distant priority areas
- Leaky dams were only suggested in relatively straight stretches, rivers < 5m wide and in locations likely to store high volumes of water
- Dams also placed at least three in a row, with the distance between each dam being at least seven times the width of the watercourse
- Local knowledge and consultation will be essential prior to deciding which locations will have dams installed.



Meets need 3. Flow regulation - high flows

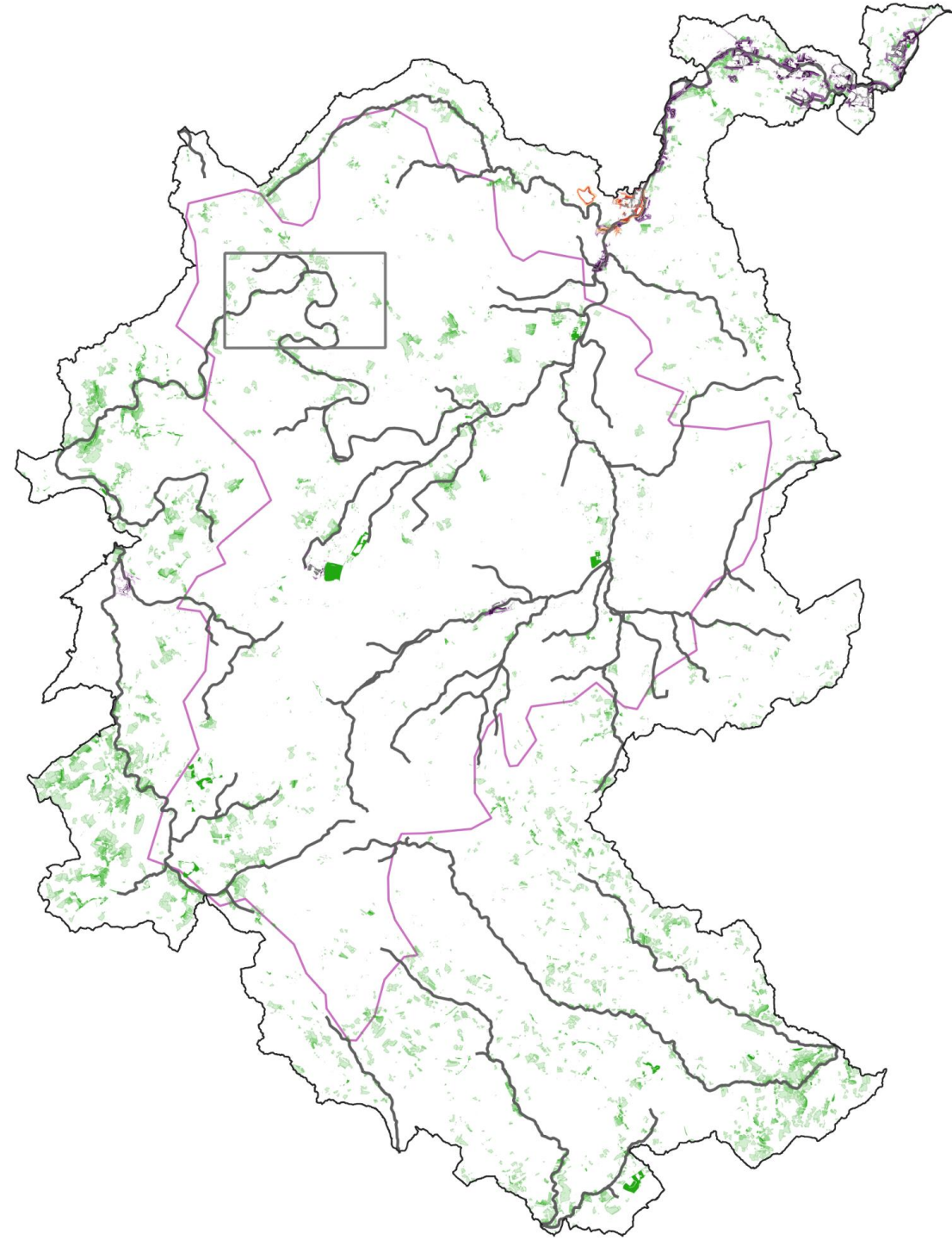
Habitat opportunity mapping

- Identifying areas where riparian woodland and wetland can be created
- Accounting for constraints (urban infrastructure, historic sites, overhead power cables and good quality habitats)
- Opportunities mapped to three different priority levels

Meets needs 2. Reducing nutrient pollution, 3. Flow regulation (high and low flows), & 4. Reversing wetland and peat degradation and loss



Reducing ammonia pollution – prioritised catchment opportunities



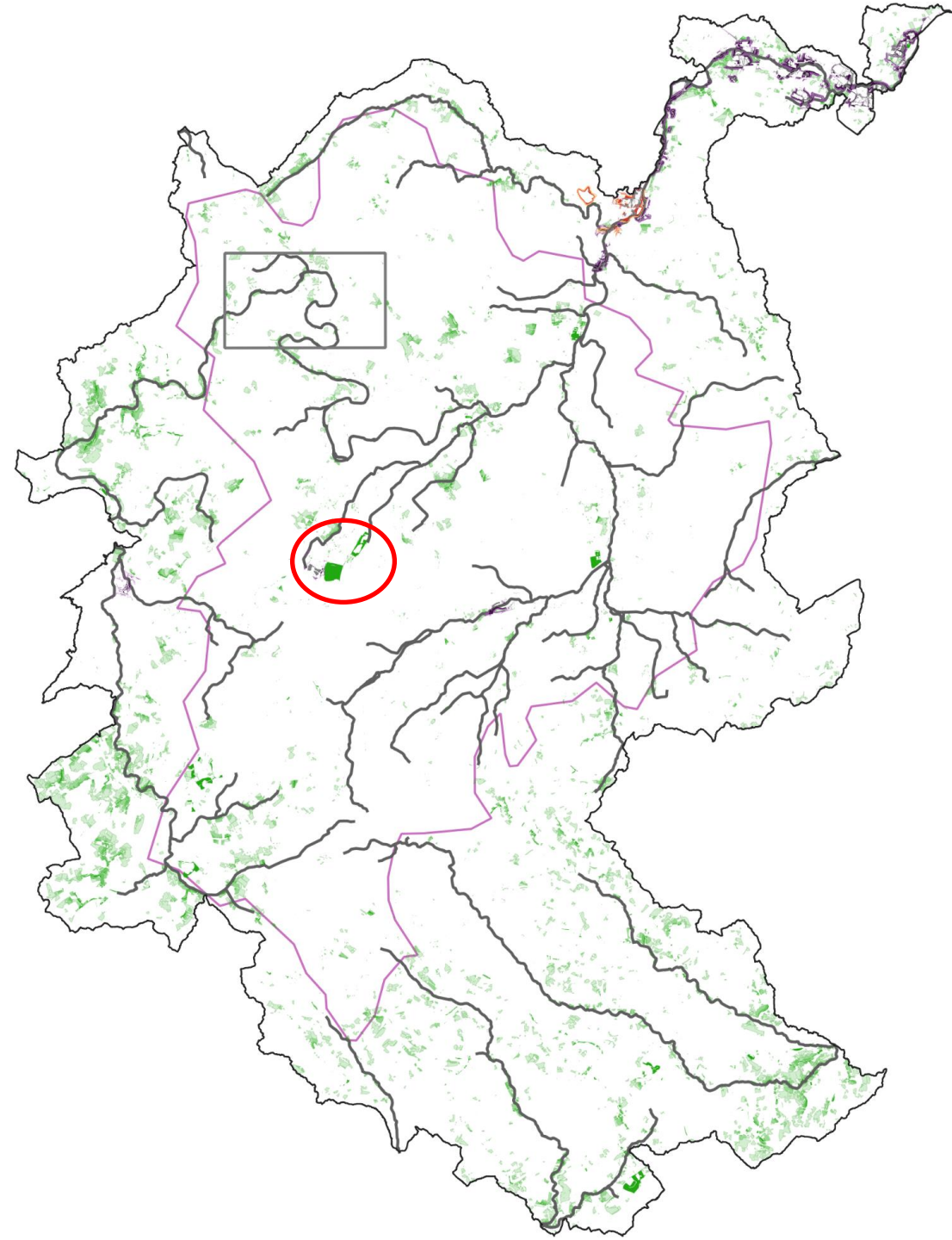
Ammonia prioritized interventions

- Afforestation < 2%
- Afforestation < 5%
- Afforestation < 10%
- Afforestation < 20%

Woodland opportunities

- Existing habitat
- Buffer opportunities - priority 1
- Stepping Stones - priority 1
- Buffer opportunities - priority 3
- Stepping Stones - priority 3

Reducing ammonia pollution – prioritised catchment opportunities



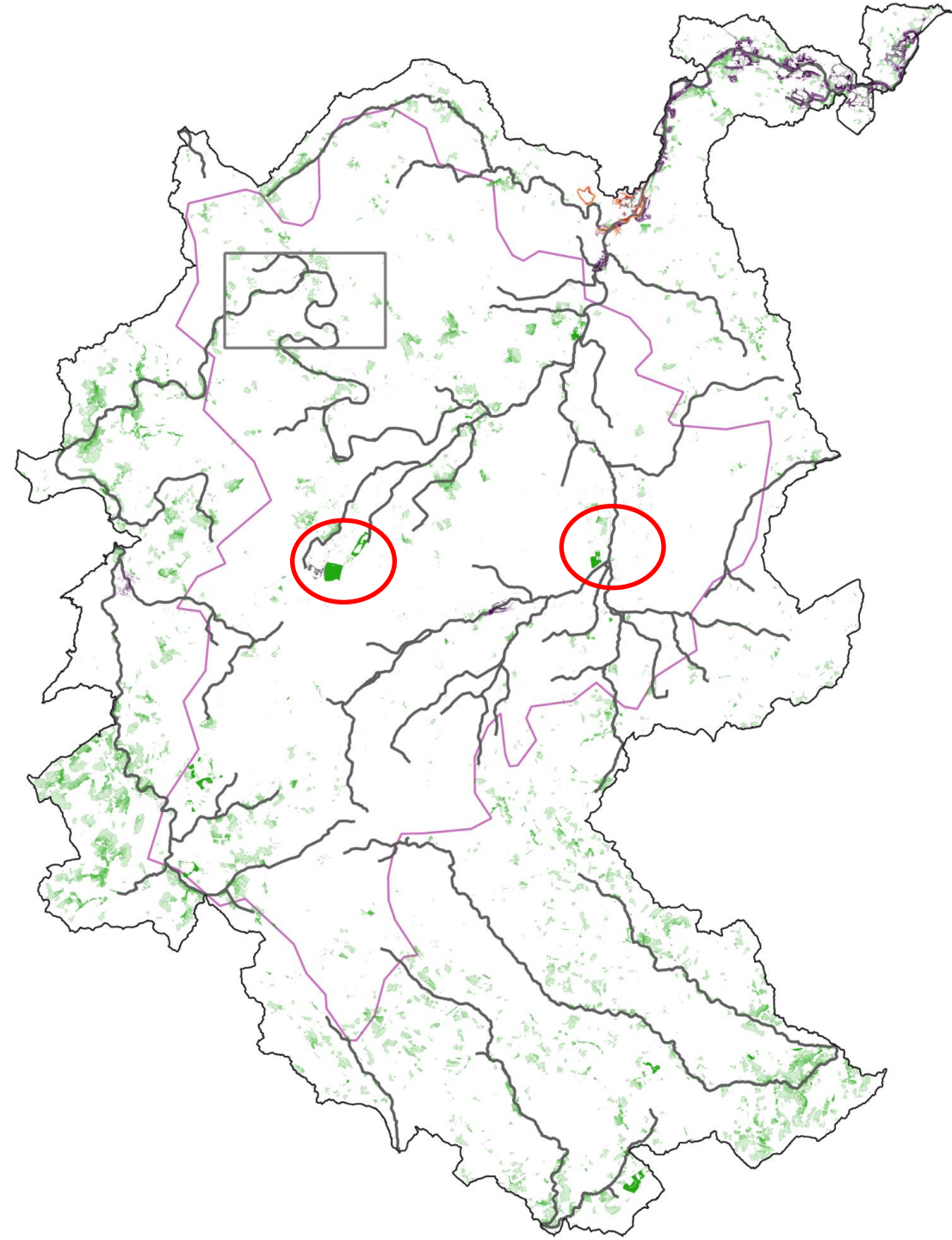
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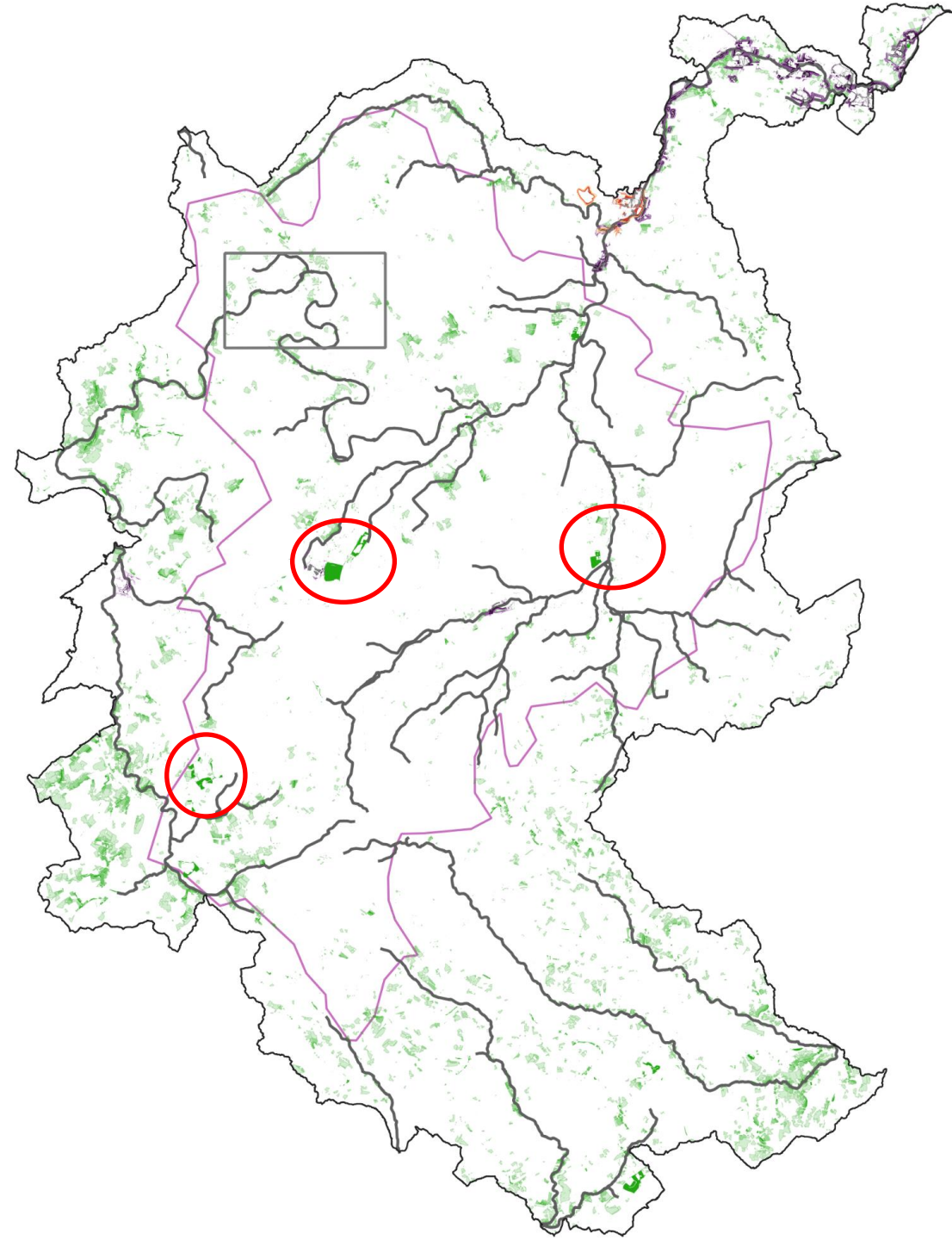
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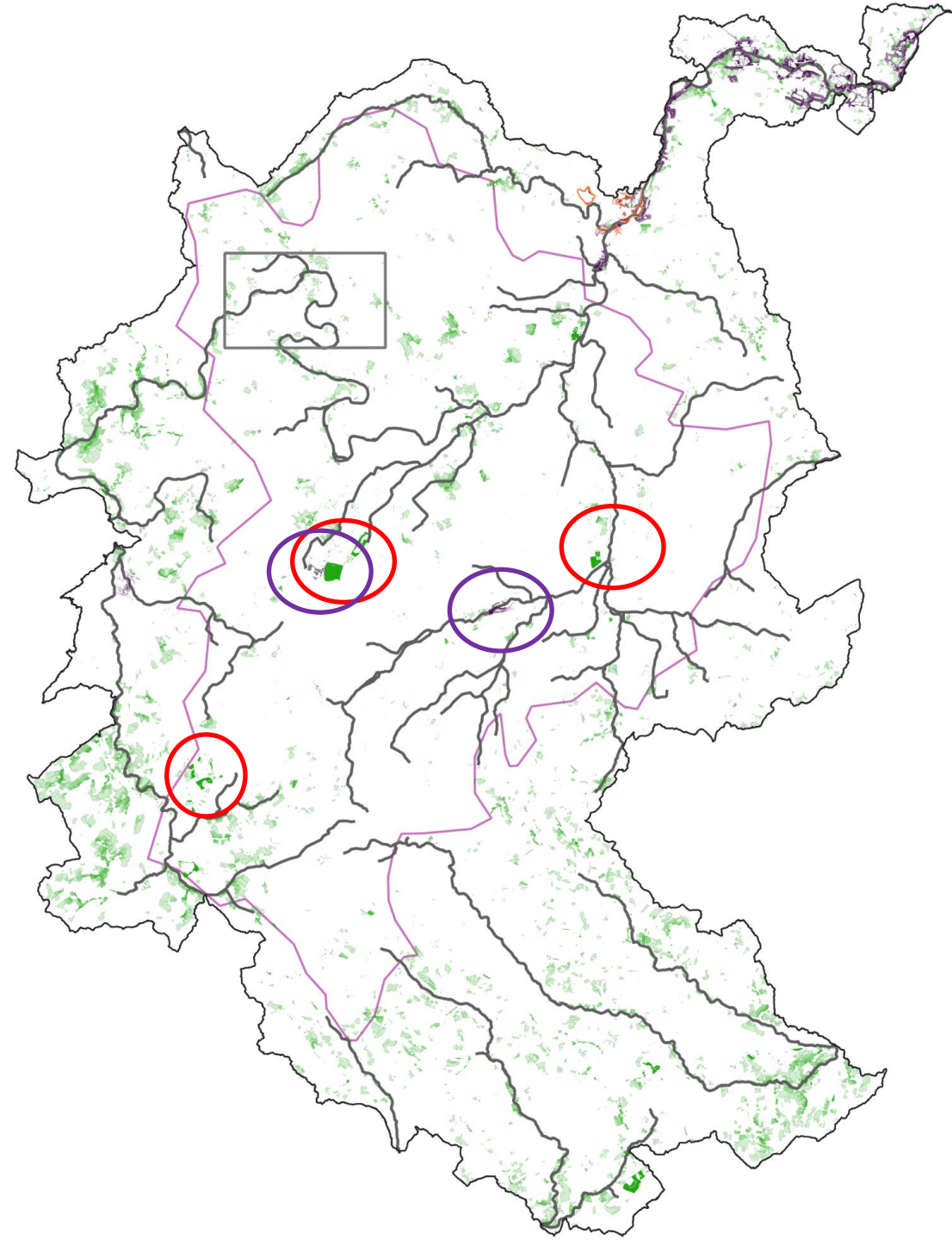
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Reducing ammonia pollution – prioritised catchment opportunities



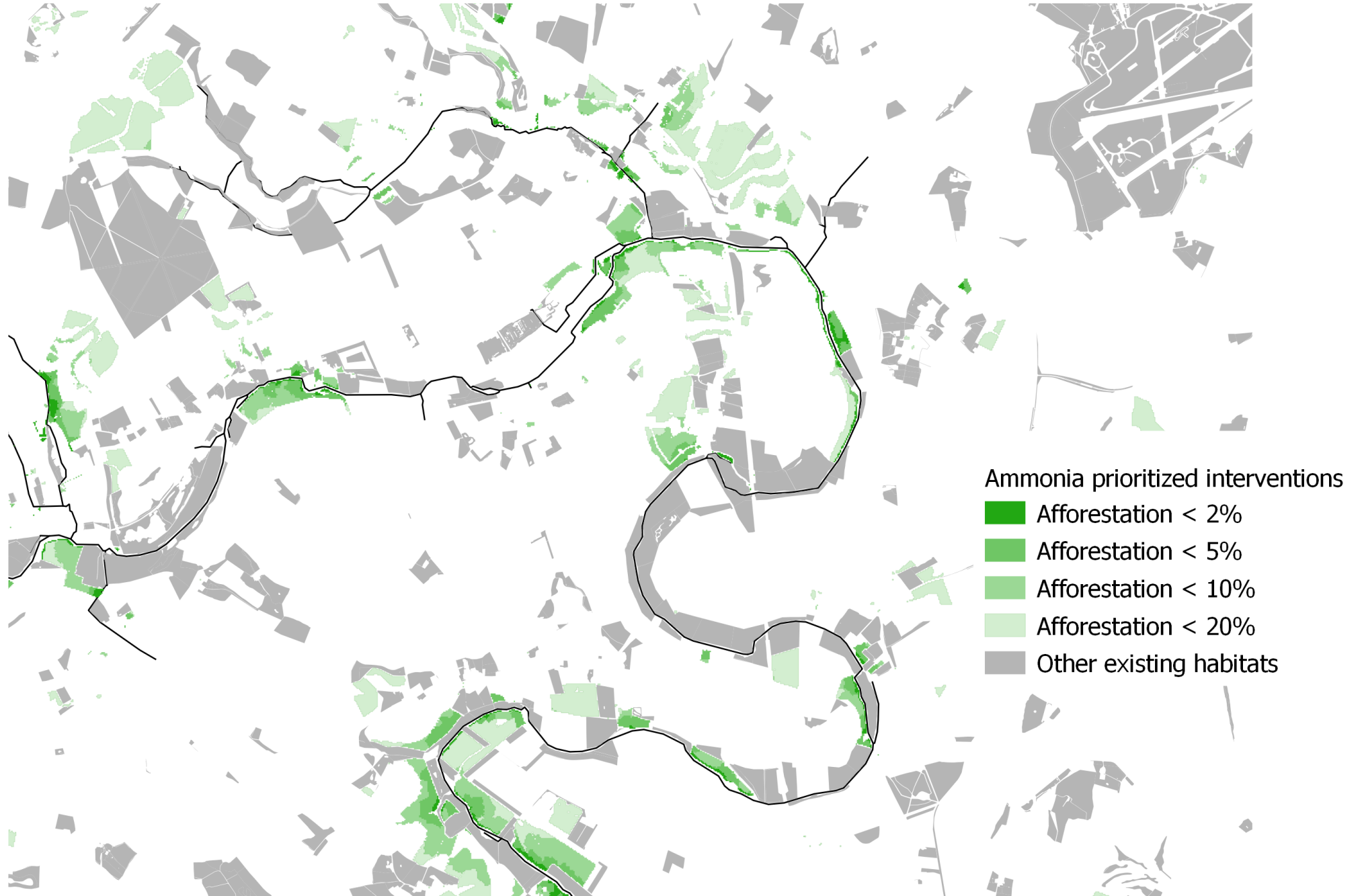
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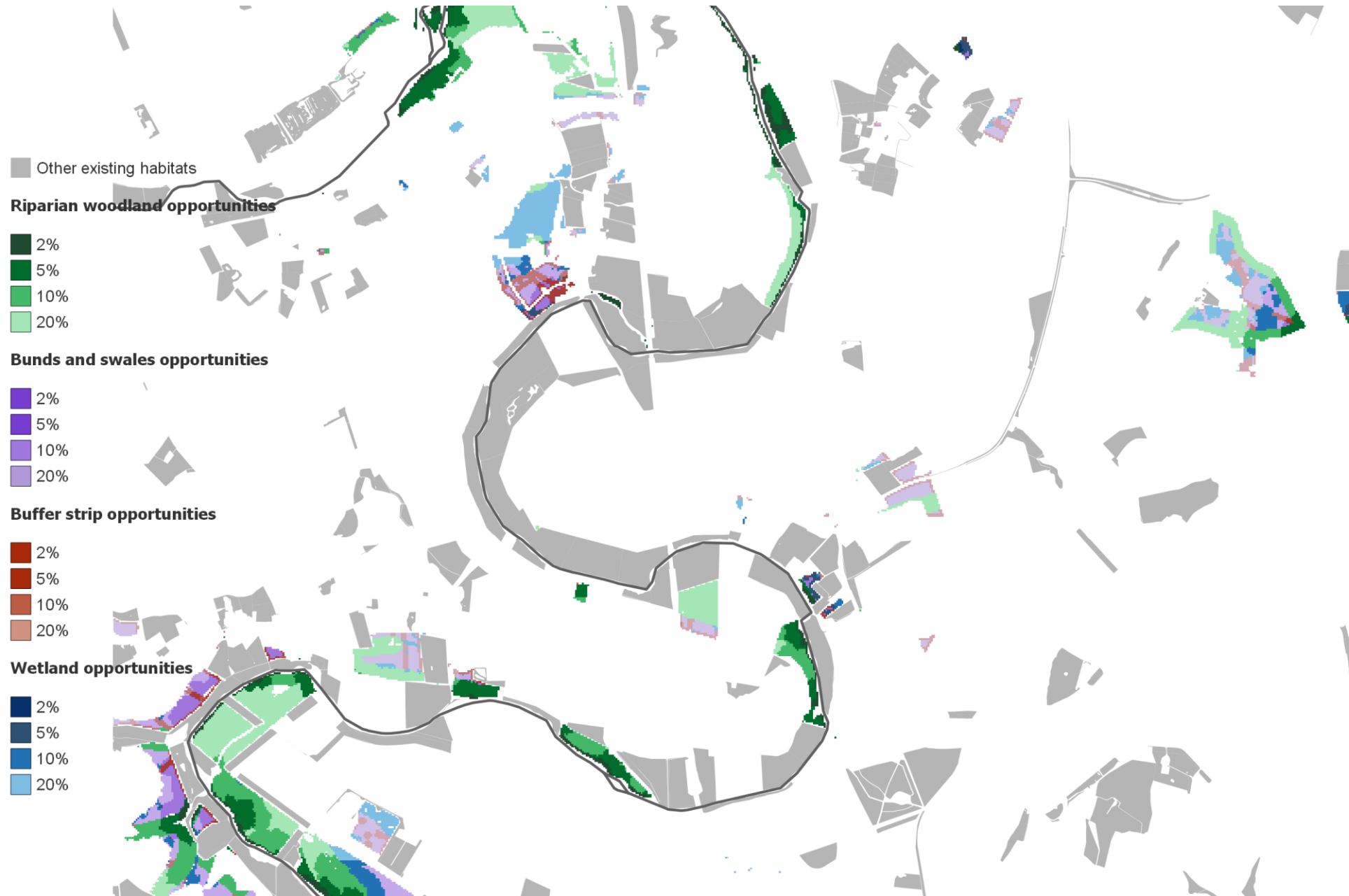
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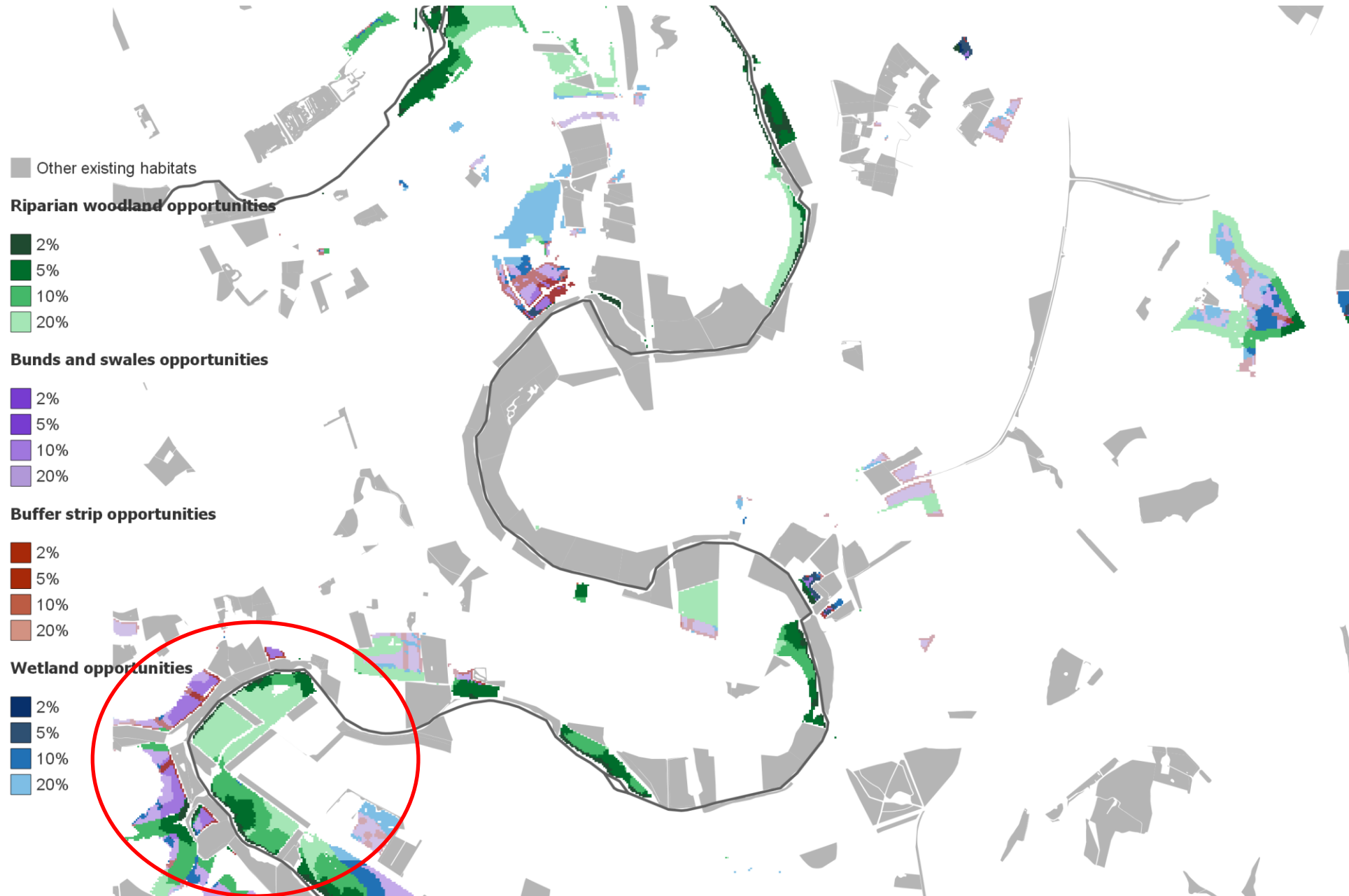
Reducing ammonia pollution opportunities



Reducing nutrient pollution – interventions



Reducing nutrient pollution – interventions

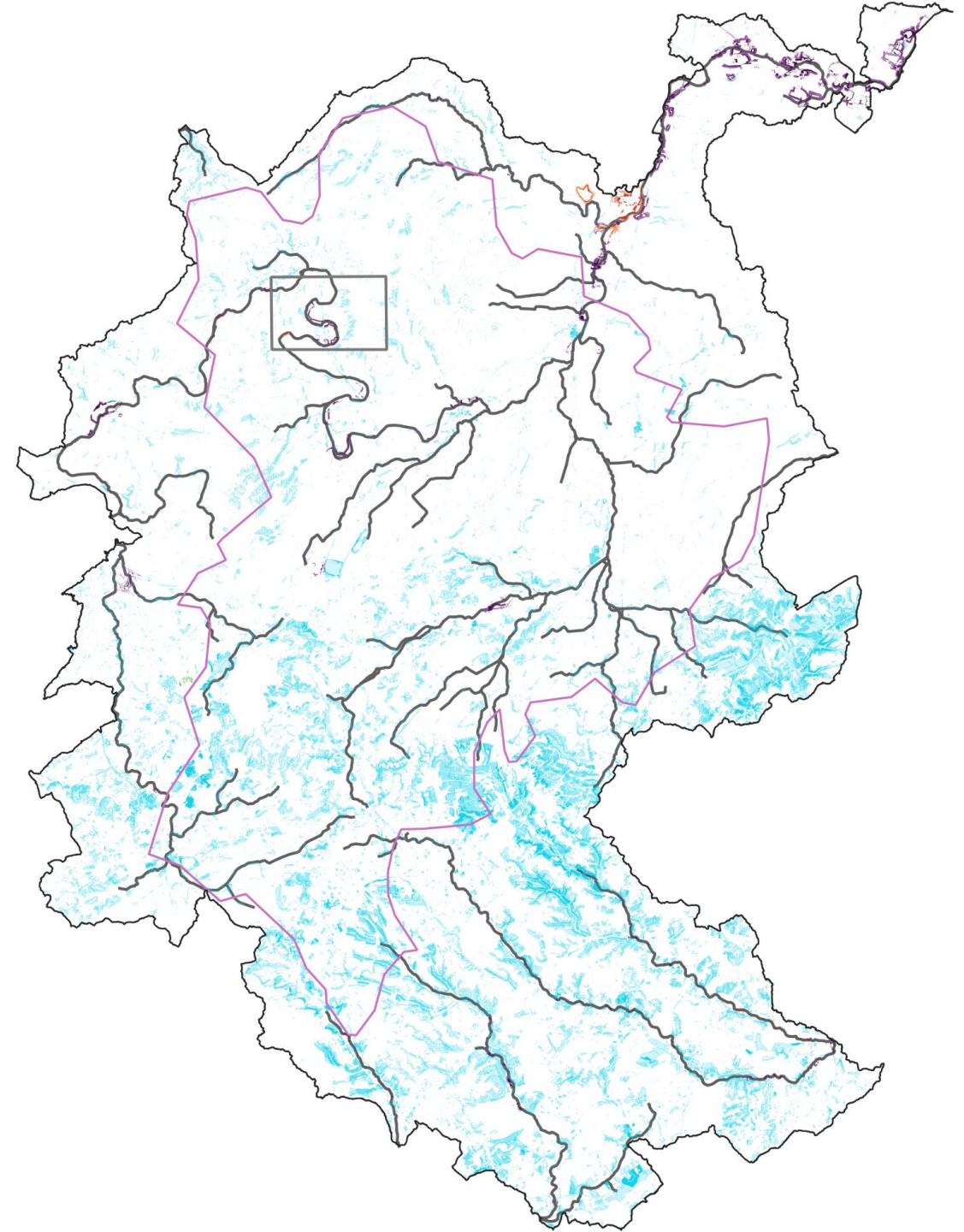


High flow regulation – prioritised catchment opportunities

Biodiversity opportunities networks Flood mitigation prioritised intervention

- Buffer opportunities 1
- Stepping Stones 1
- Buffer opportunities 2
- Stepping Stones 2
- Buffer opportunities 3
- Stepping Stones 3

- Wetland / Water Retention < 2%
- Wetland / Water Retention < 5%
- Wetland / Water Retention < 10%
- Wetland / Water Retention < 20%
- Afforestation < 2%
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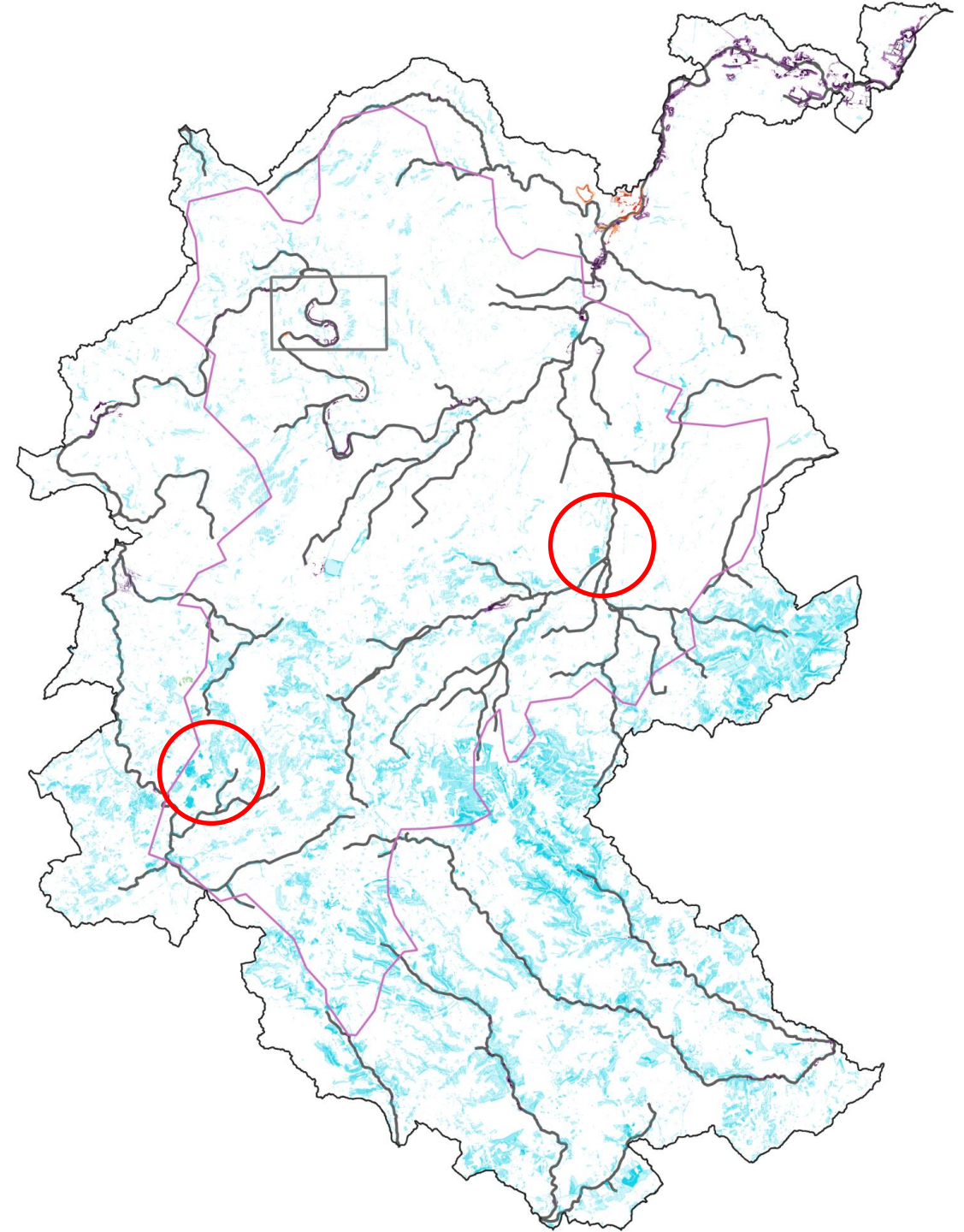


High flow regulation – prioritised catchment opportunities

Biodiversity opportunities networks Flood mitigation prioritised intervention

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- Stepping Stones 2
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- Stepping Stones 3

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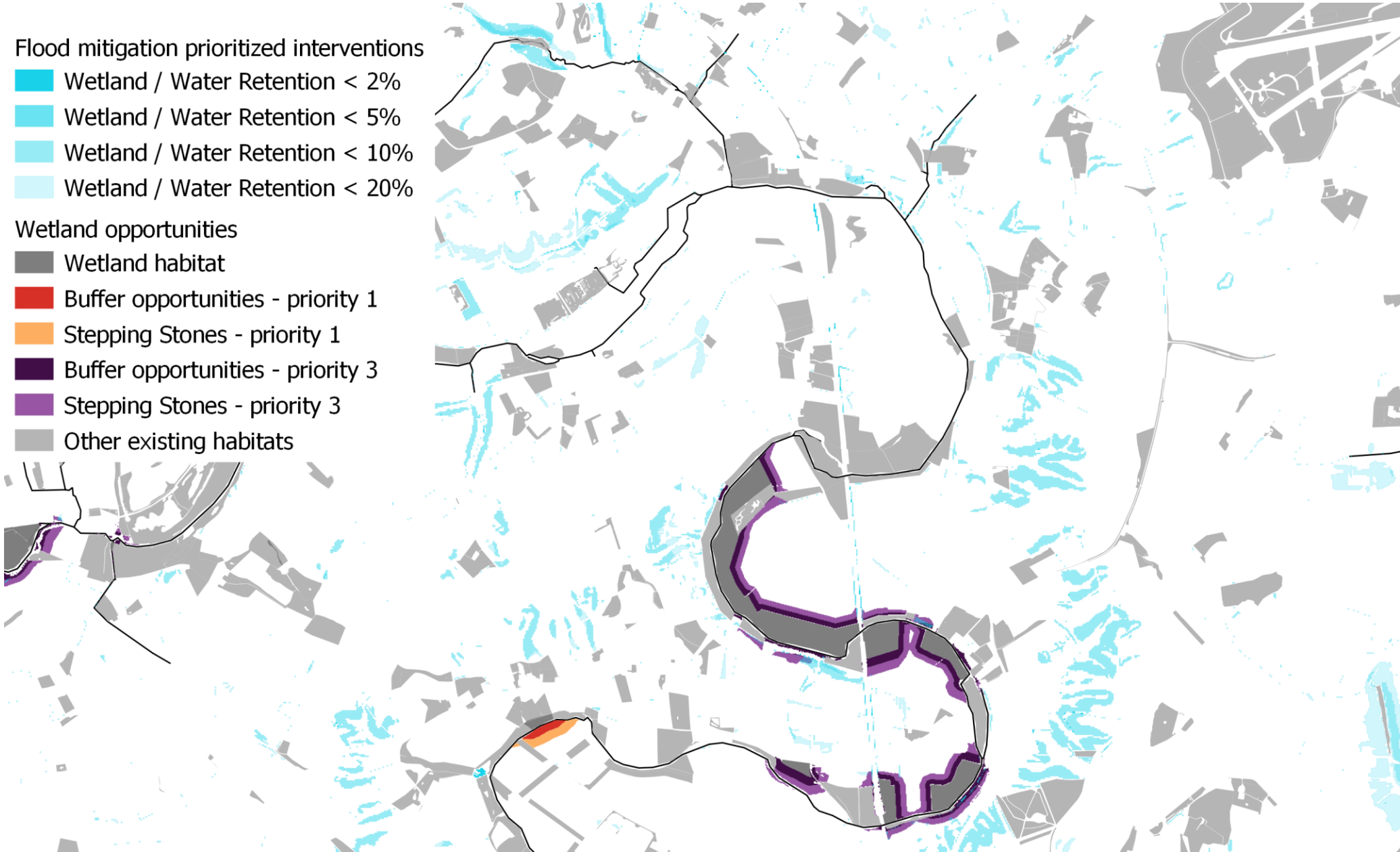
High flow regulation opportunities

Flood mitigation prioritized interventions

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Wetland opportunities

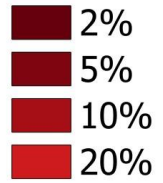
- Wetland habitat
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- Stepping Stones - priority 1
- Buffer opportunities - priority 3
- Stepping Stones - priority 3
- Other existing habitats



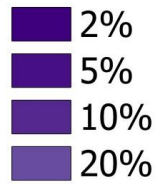
High flow regulation – prioritised interventions

Leaky dams

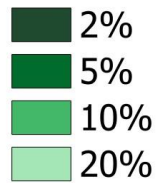
Buffer strip opportunities



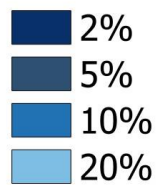
Bunds and swales opportunities



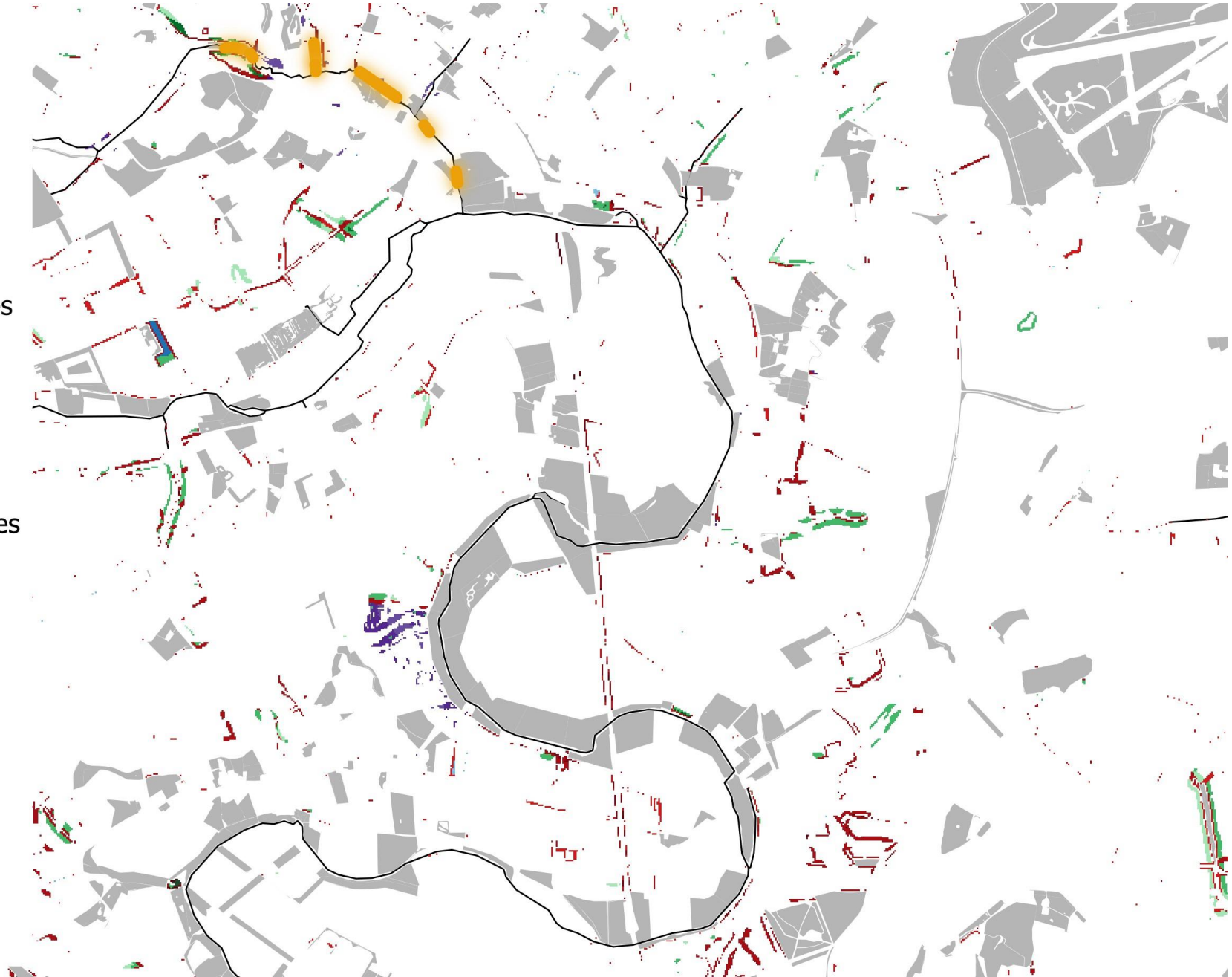
Riparian woodland opportunities



Wetland opportunities



Other existing habitats



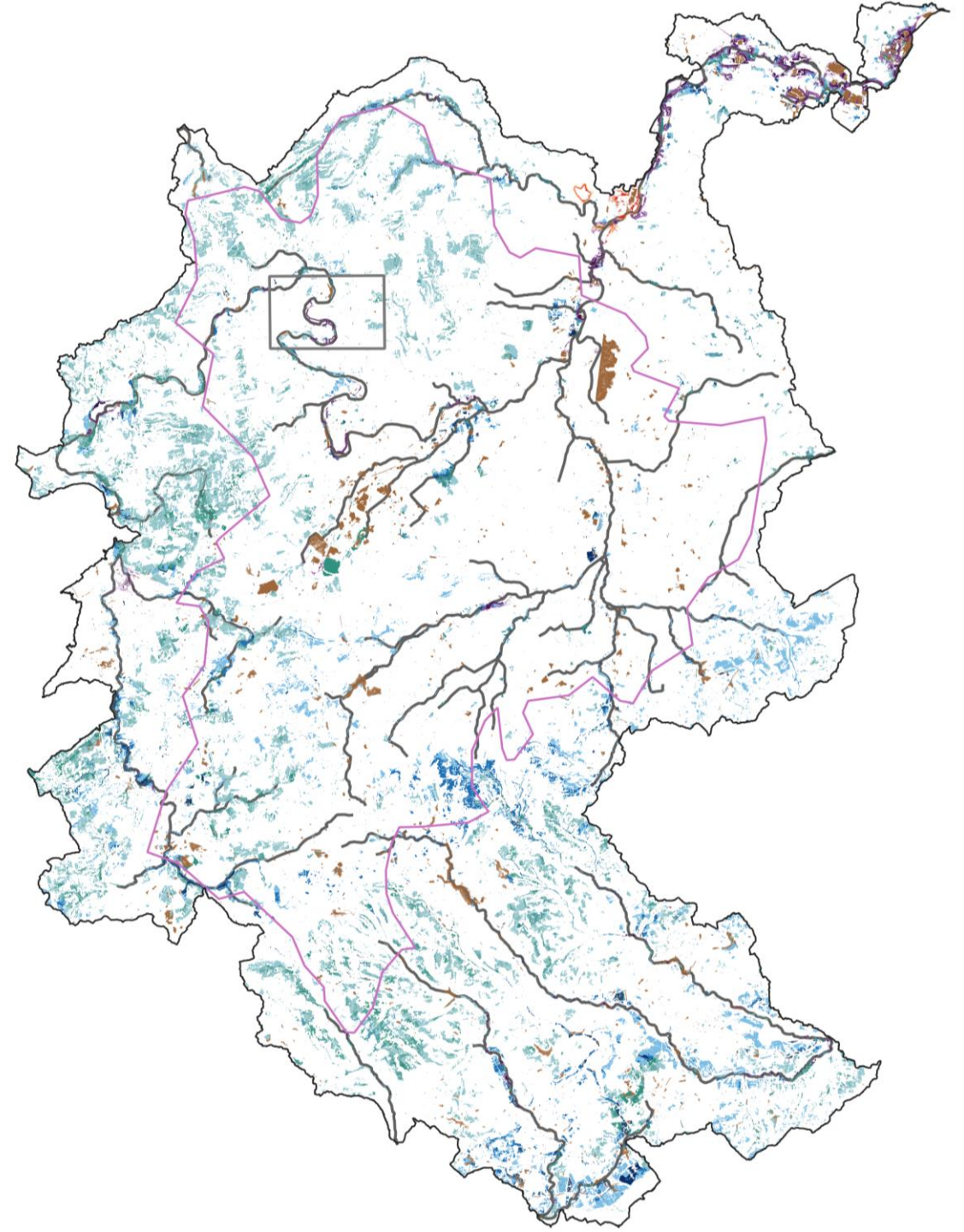
Low flow regulation – prioritised catchment opportunities

Biodiversity opportunities networks Wetland opportunities Wetland opportunities on clay

- Buffer opportunities 1
- Stepping Stones 1
- Buffer opportunities 2
- Stepping Stones 2
- Buffer opportunities 3
- Stepping Stones 3
- Depressions >100mm

- 2%
- 5%
- 10%
- 20%

- 2%
- 5%
- 10%
- 20%



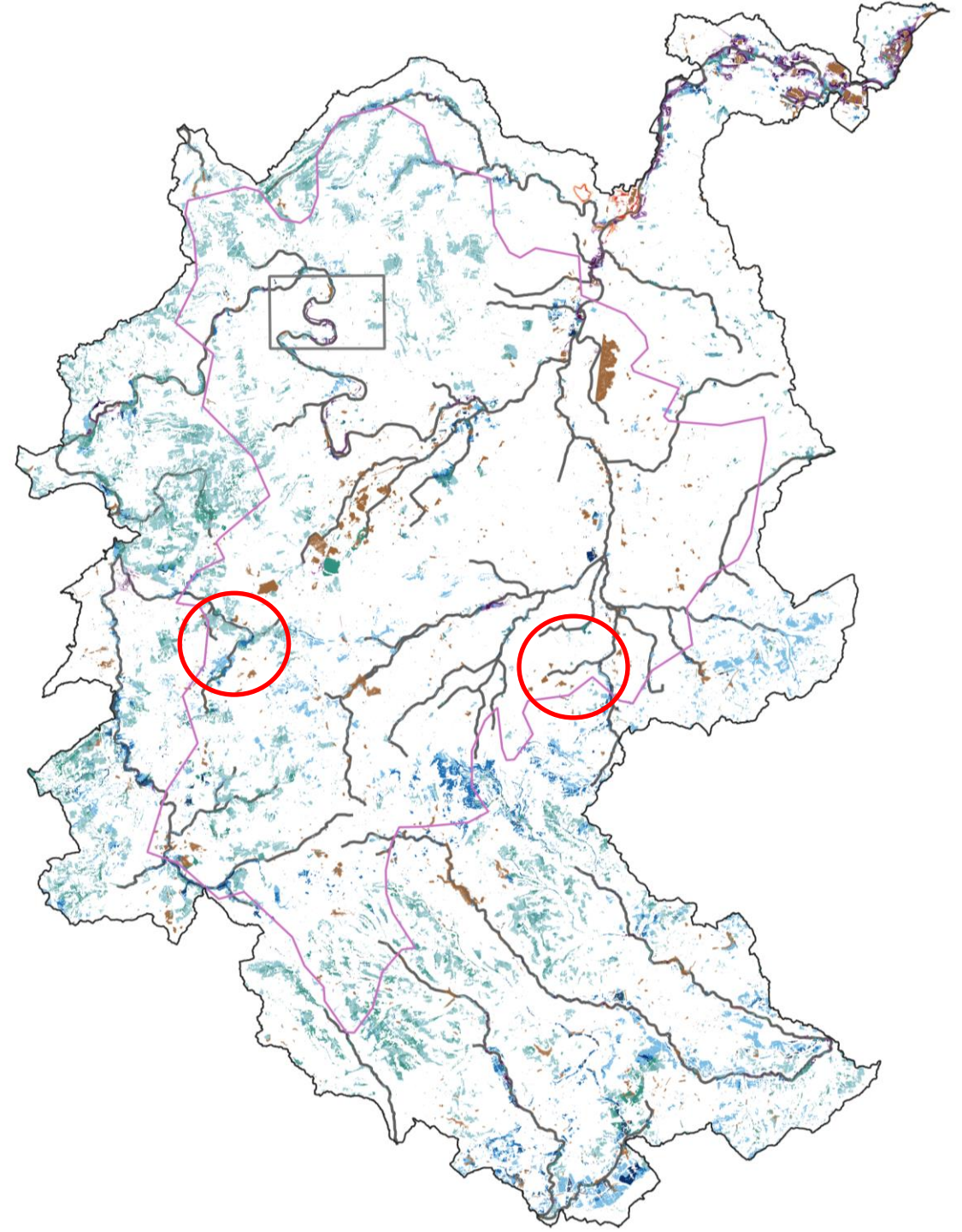
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- 2%
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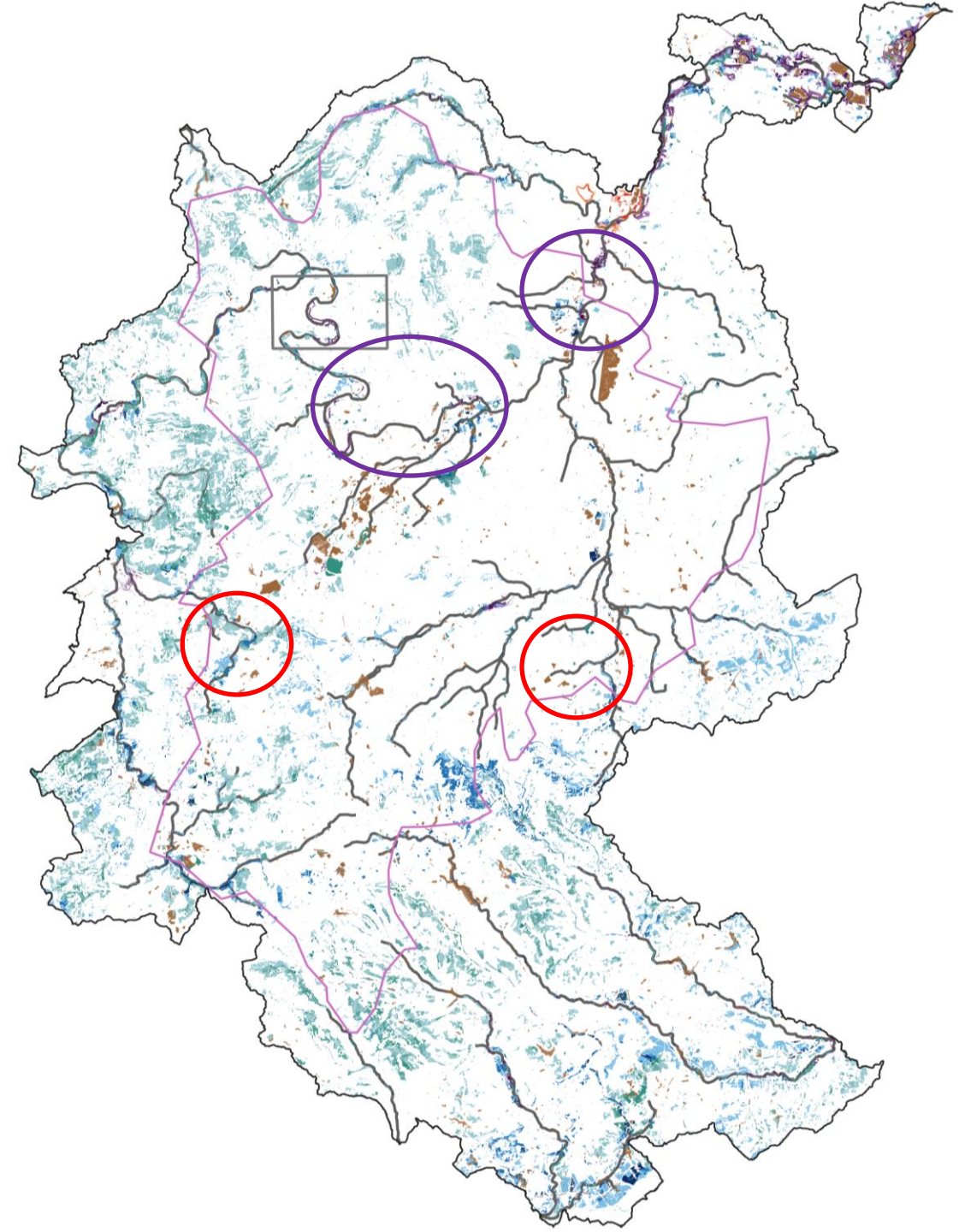
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- Buffer opportunities 2
- Stepping Stones 2
- Buffer opportunities 3
- Stepping Stones 3
- Depressions >100mm

- 2%
- 5%
- 10%
- 20%

- 2%
- 5%
- 10%
- 20%



Low flow regulation - opportunities

Depressions > 100mm

Wetland on clay opportunities

2%

5%

10%

20%

Wetland opportunities

2%

5%

10%

20%

Wetland opportunities

Wetland habitat

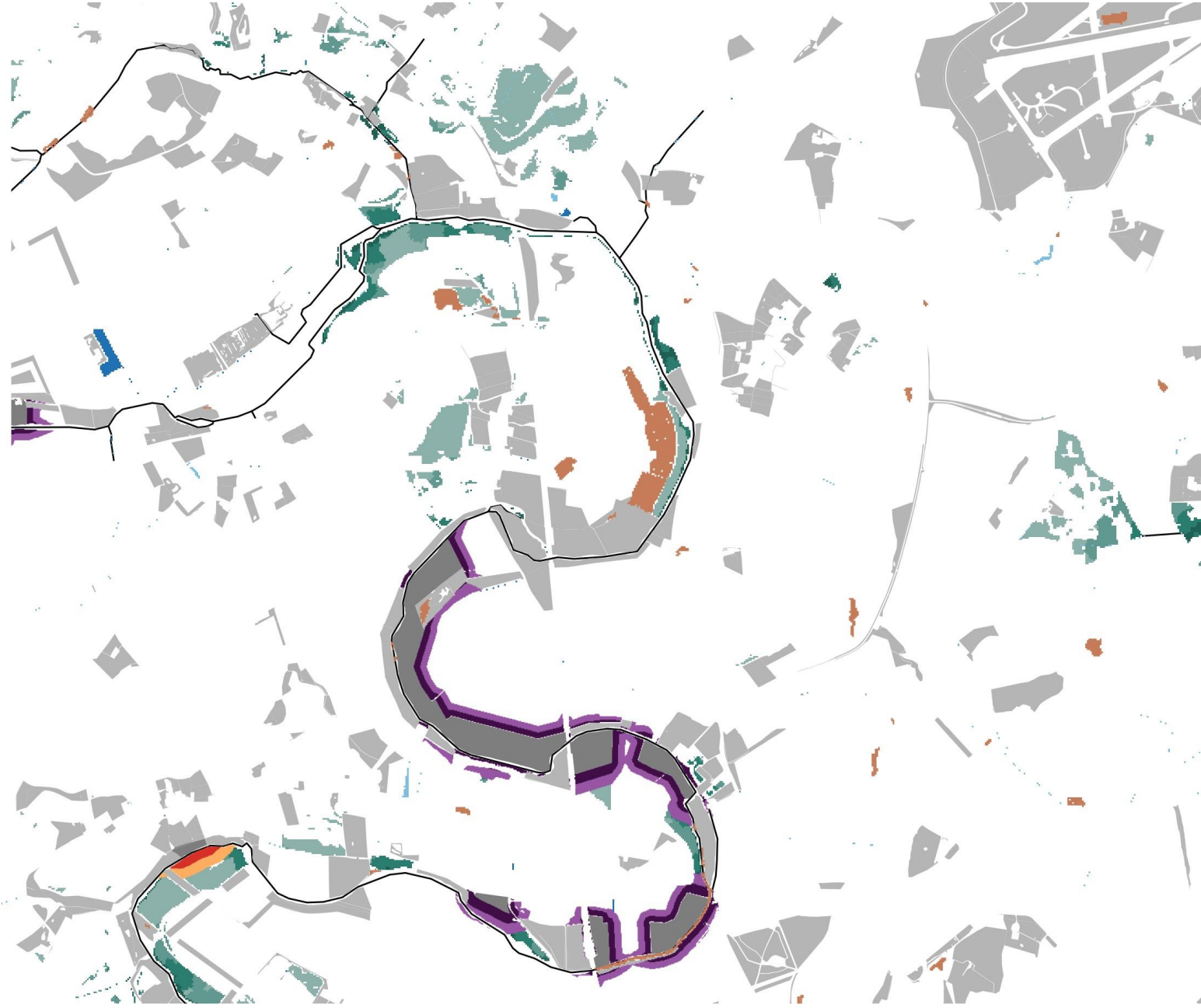
Buffer opportunities - priority 1

Stepping Stones - priority 1

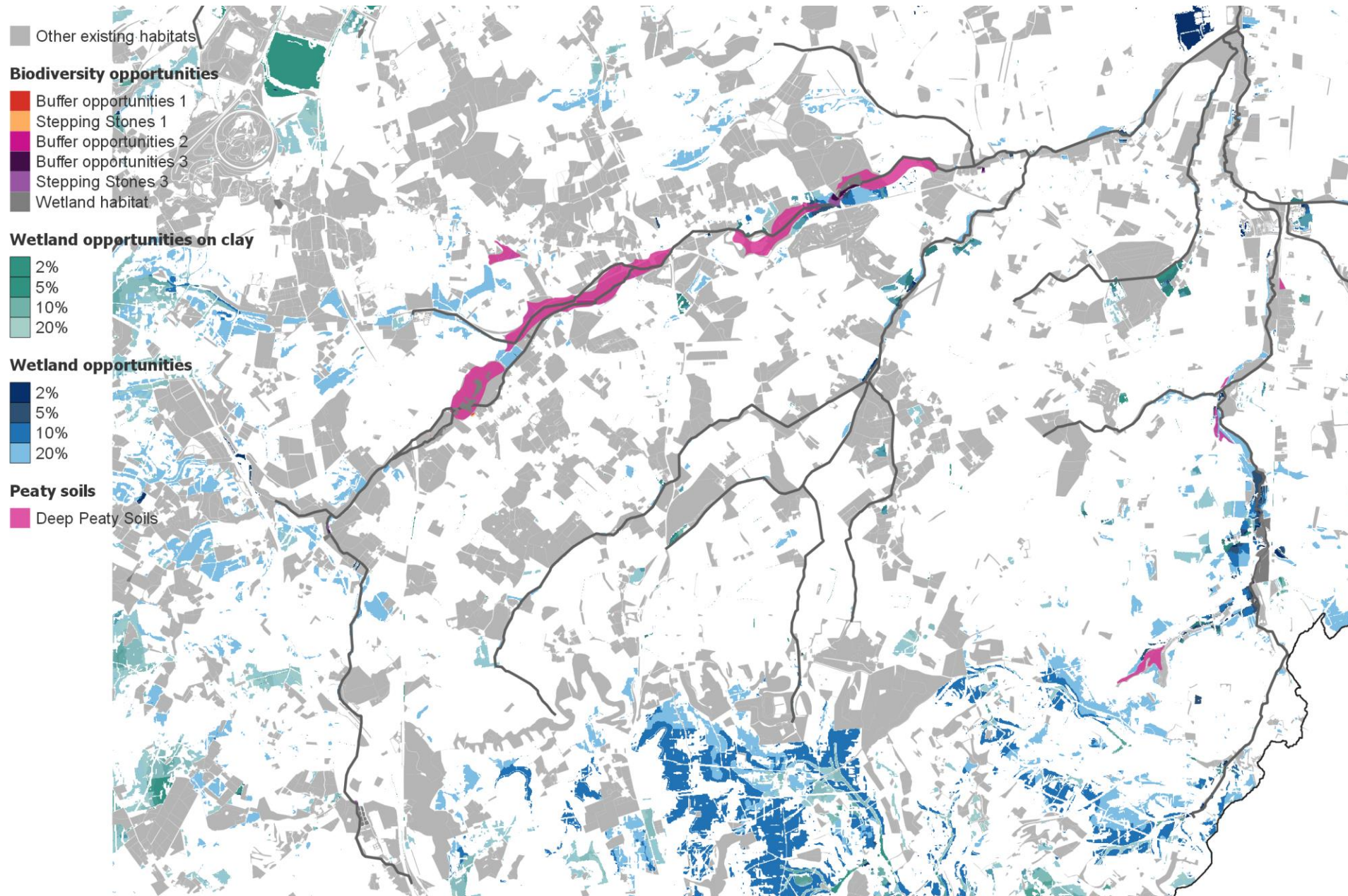
Buffer opportunities - priority 3

Stepping Stones - priority 3

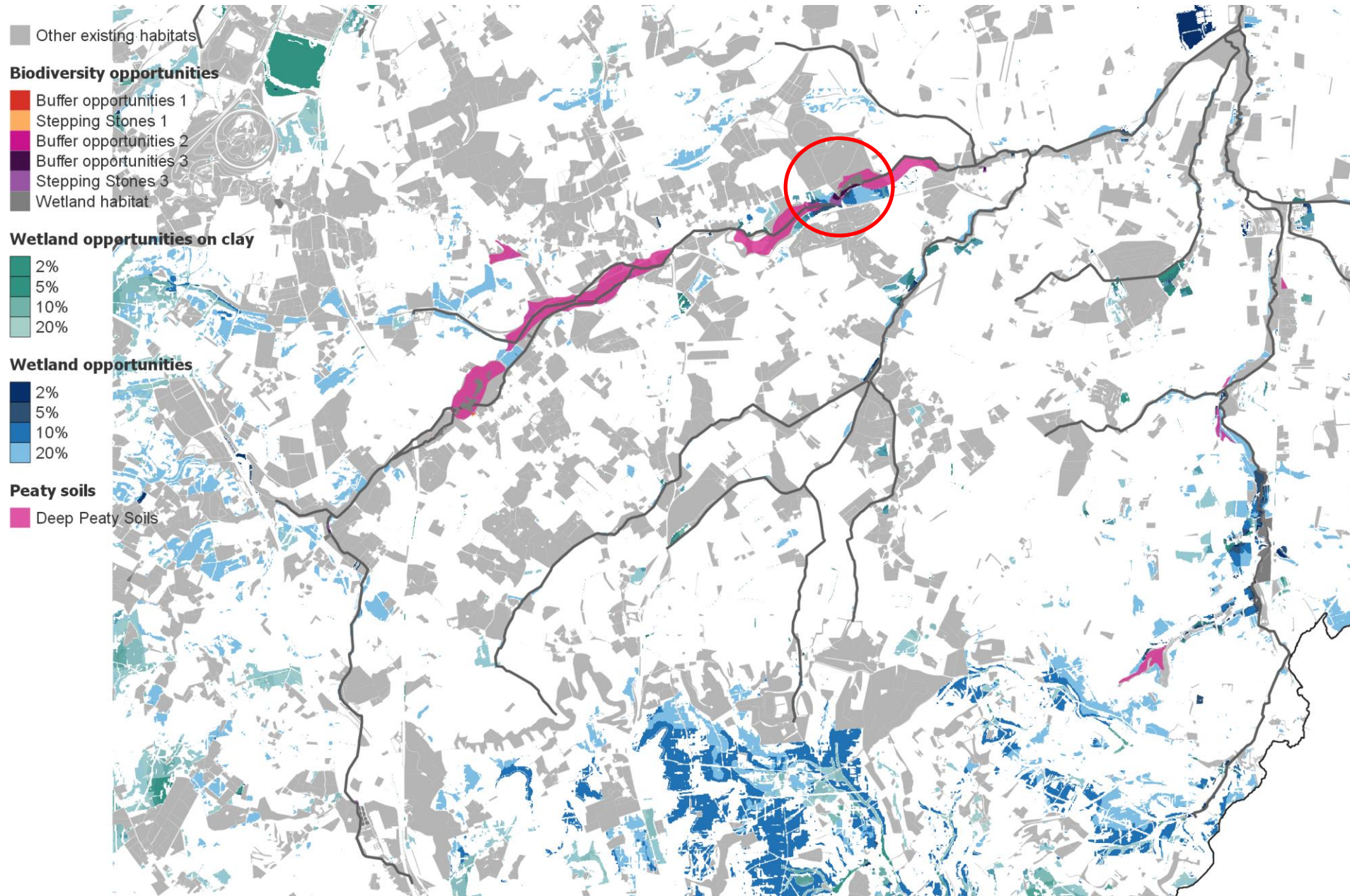
Other existing habitats



Reversing peat degradation through wetland creation



Reversing peat degradation through wetland creation



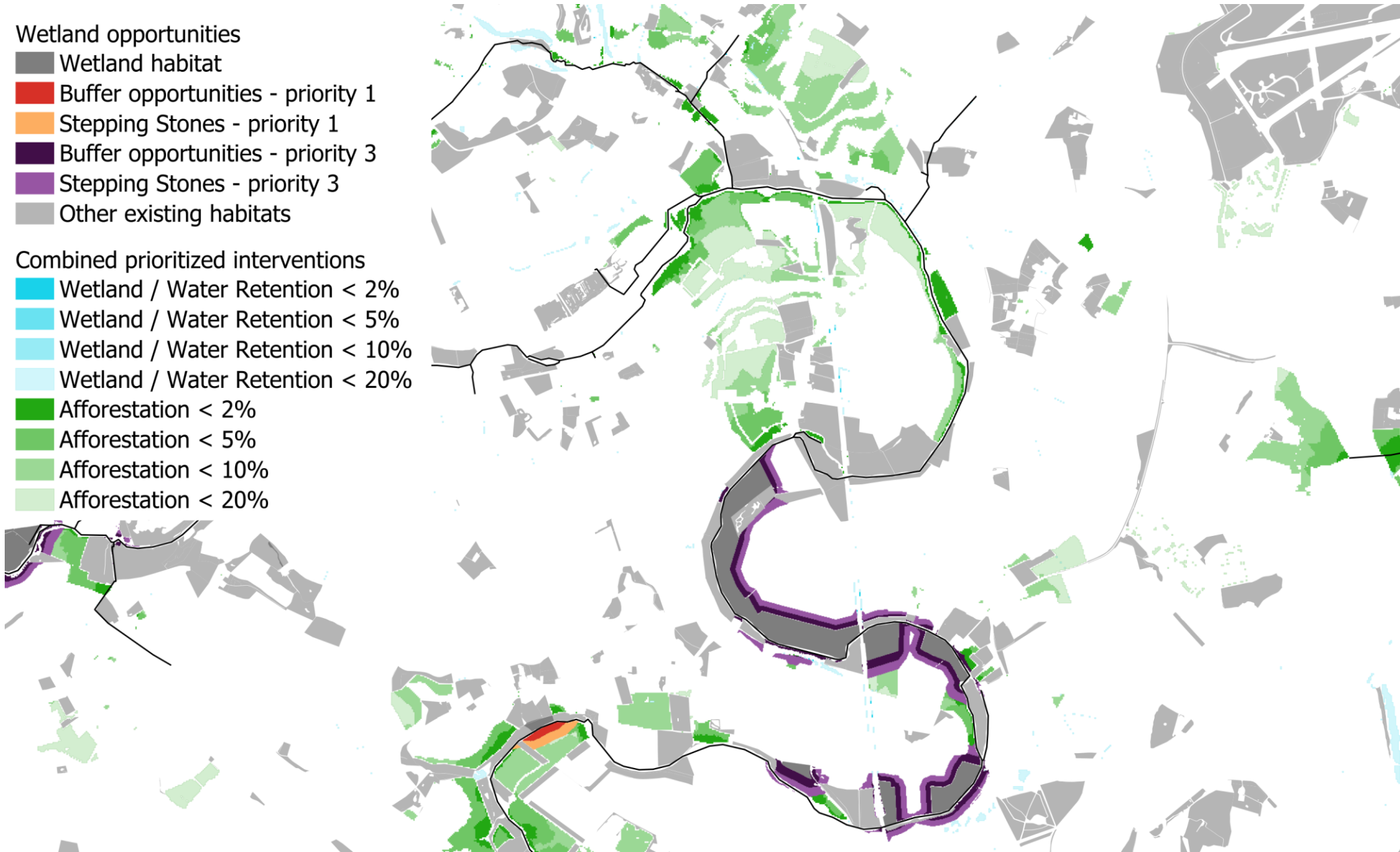
Prioritised catchment opportunities across all needs

Wetland opportunities

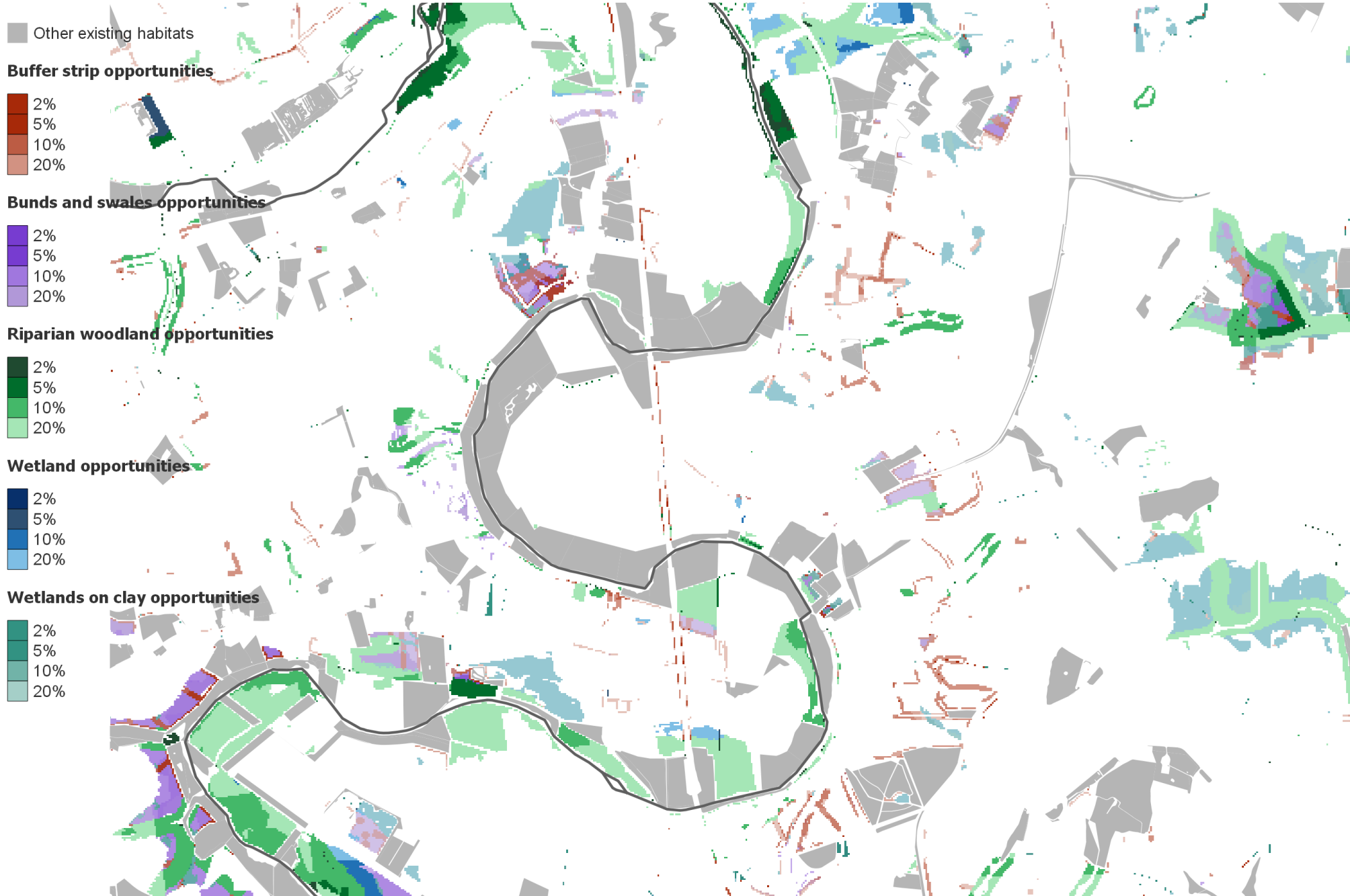
- Wetland habitat
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- Stepping Stones - priority 3
- Other existing habitats

Combined prioritized interventions

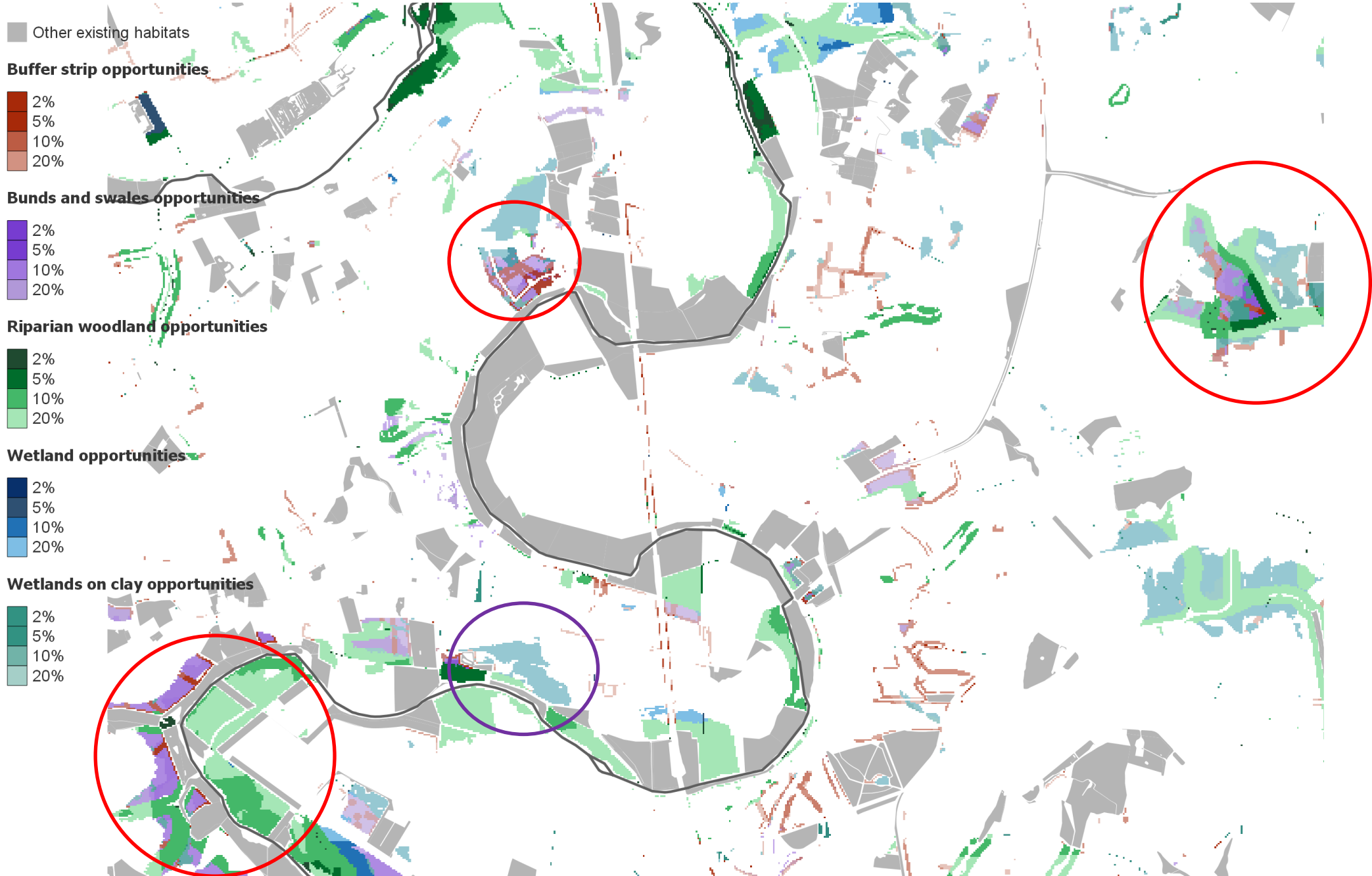
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Prioritised interventions across all needs



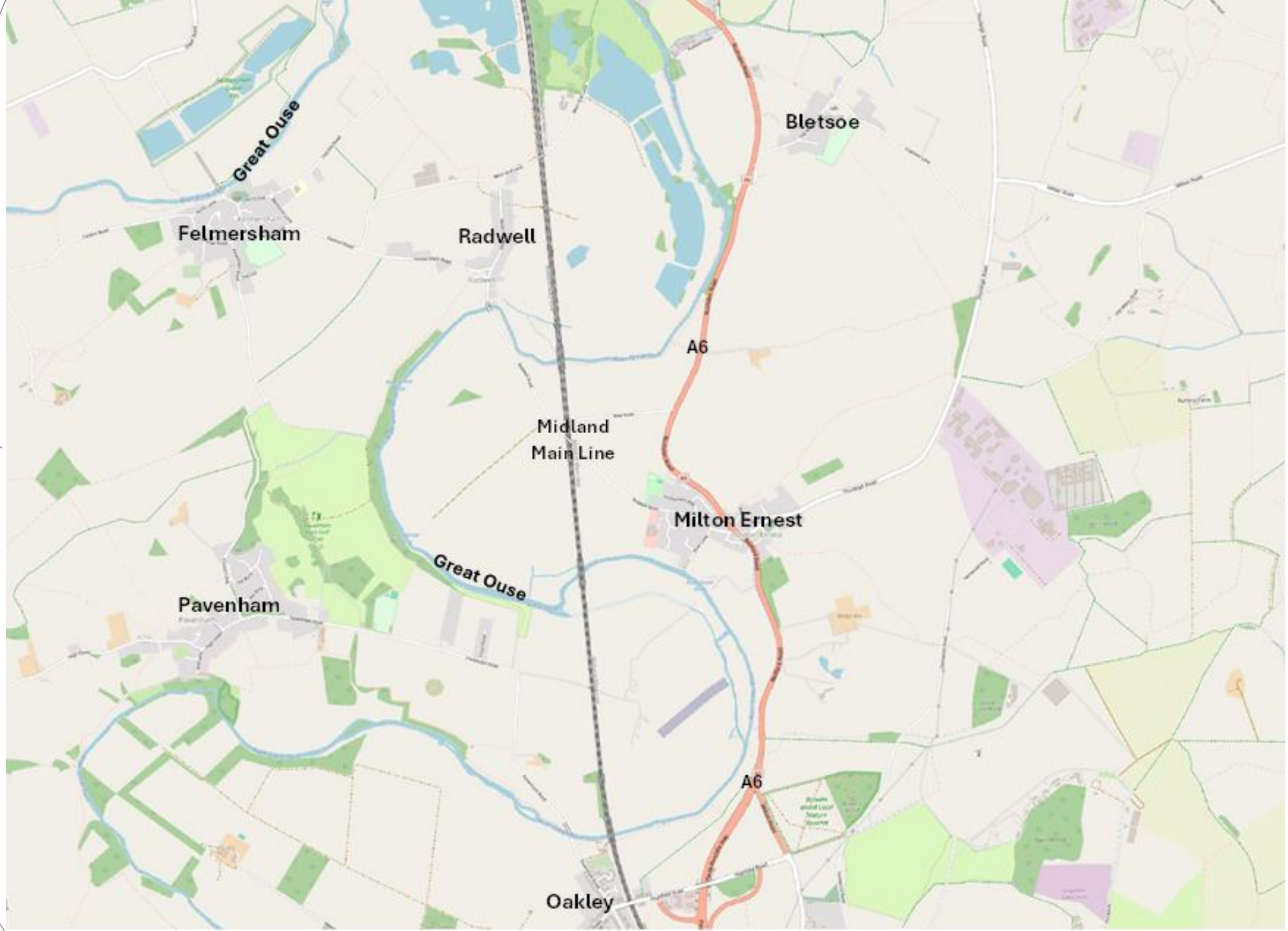
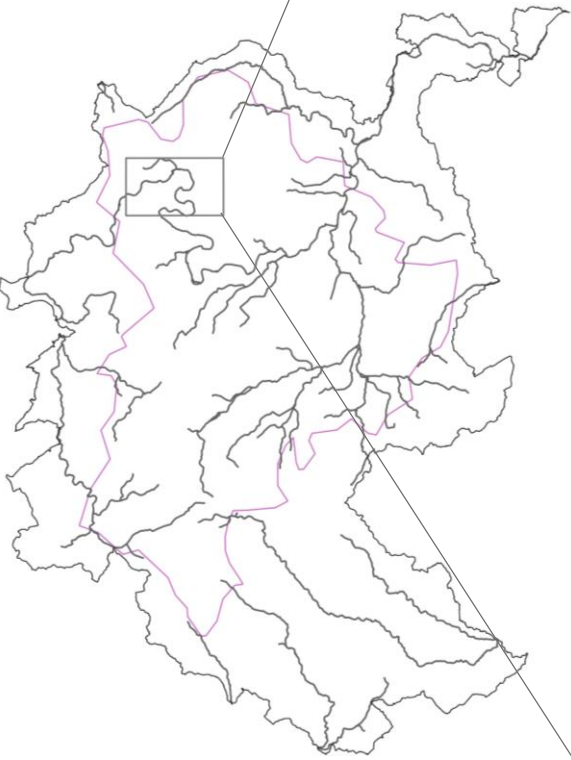
Prioritised interventions across all needs





Prioritisation

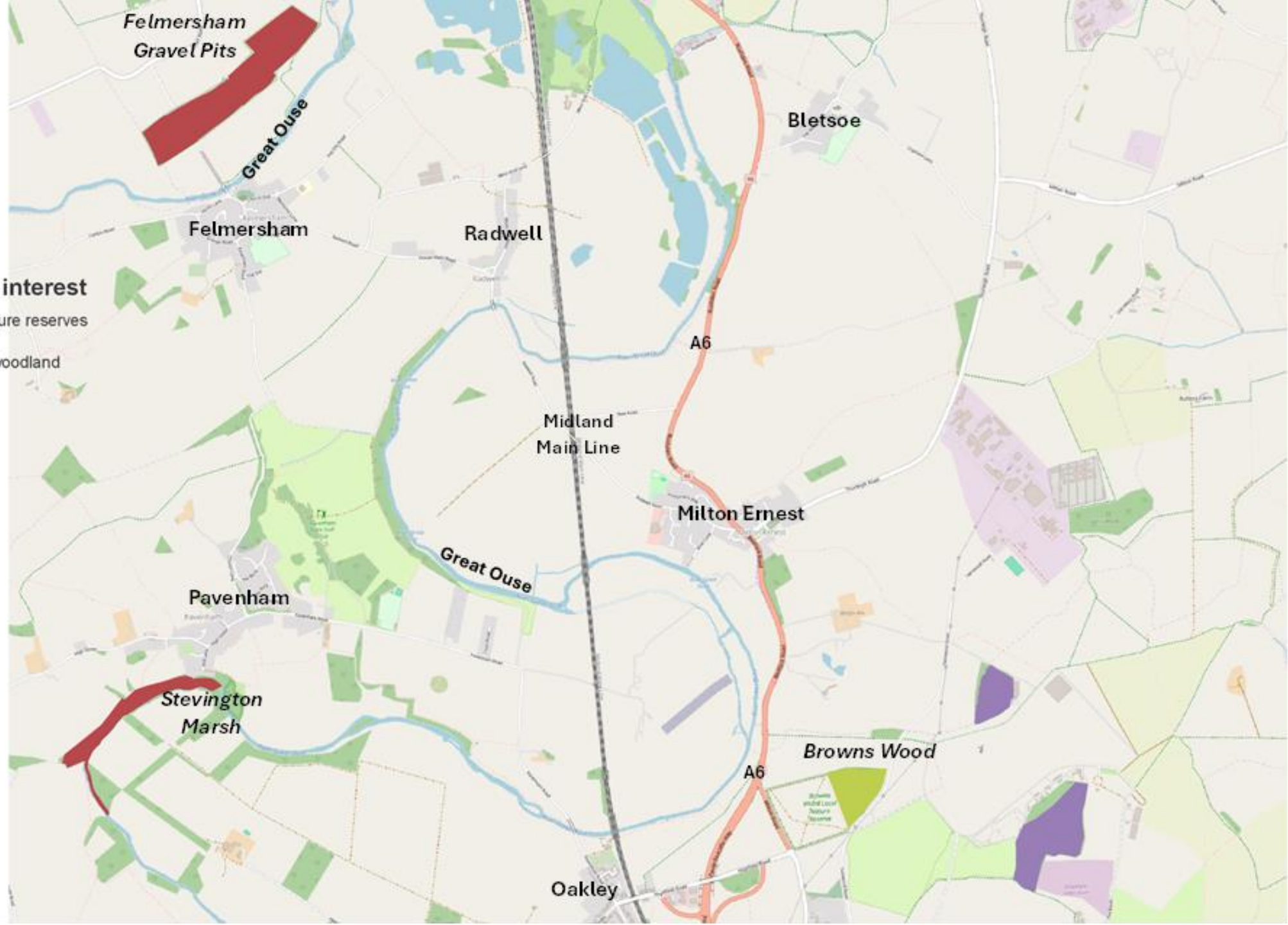
Great Ouse near Milton Earnest



Areas of biodiversity interest

Areas of interest

- Local nature reserves
- SSSIs
- Ancient woodland



Habitats

— Contour lines

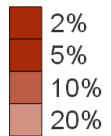
Habitats

- Arable
- Uncertain agriculture
- Amenity grassland
- Improved grassland
- Marshy grassland
- Semi-natural grassland
- Fen, marsh and swamp
- Broadleaved woodland
- Coniferous woodland
- Mixed woodland
- Scrub
- Trees / Parkland
- Water
- Garden
- Built-up areas
- Mixed / other / uncertain
- Unclassified

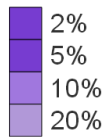


Other existing habitats

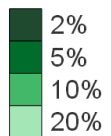
Buffer strip opportunities



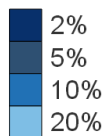
Bunds and swales opportunities



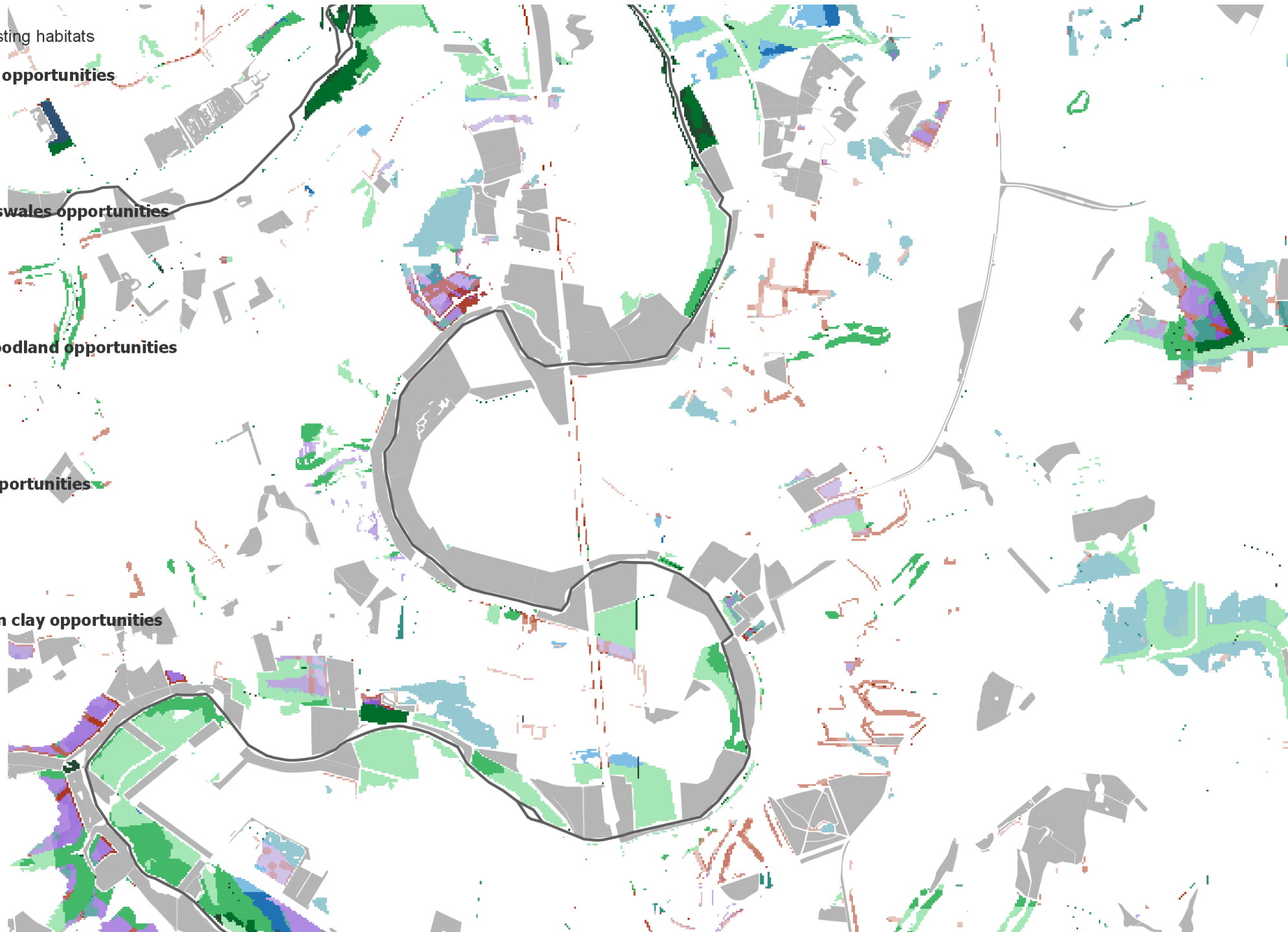
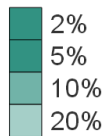
Riparian woodland opportunities



Wetland opportunities



Wetlands on clay opportunities



Other existing habitats

Buffer strip opportunities

2%
5%
10%
20%

Bunds and swales opportunities

2%
5%
10%
20%

Riparian woodland opportunities

2%
5%
10%
20%

Wetland opportunities

2%
5%
10%
20%

Wetlands on clay opportunities

2%
5%
10%
20%



Discussion

Aim: Come up with an approach for choosing the interventions to take forward in this location.

Consider the following:

- How will you prioritise interventions across needs balancing the water benefits with biodiversity – where are there synergies and trade offs?
- How many interventions or groups of interventions are practical to deliver?
- Which interventions would work well together and which would not?
- How can you work together with farmers and estate managers to deliver interventions?
- Which schemes or agreements can help deliver these interventions? E.g. How can farmers fund the integration of these features on their farms through ELMs?

Project Timetable

- Project started in January, completes mid-May
- This workshop – informing Final Report on the approach
- Beds LNRS – **development phase** – ‘Real Time’ feed-in of project findings and outputs

Next Steps: Roll-out & Evaluation

- Considering how best to share with Defra/EA/NE Policy Leads – **Final Evaluation** of full impact of approach – late 2024/early 2025
- Finalising roll-out to wider RA/NE LNRS Advisor Network in short-term

Thank you!

Further comments to:

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By 5pm Friday 3rd May

