Strategic Regional Water Resource Solutions: Annex B2.8: Biodiversity and Environmental Ambition Evidence Report

Standard Gate Two Submission for River Severn to River Thames Transfer (STT)

Date: November 2022

Severn to Thames Transfer

Protected species evidence report

Disclaimer

SEVERN THAMES TRANSFER SOLUTION

Biodiversity Resilience and Environmental Ambition Evidence Report

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1. INTRODUCTION

1.1 BACKGROUND AND DESCRIPTION OF THE STT SCHEME

1.1.1   The River Severn to River Thames Transfer Description

The aim of the Severn Thames Transfer is to provide additional raw water resources of 300 to 500Ml/d to the South East of England during drought, with 500Ml/d preferred by the Water Resources in the South East (WRSE) group's emerging regional plan. The water would be provided from flows in the River Severn and transferred via an interconnector to the River Thames. For the completion of the Gate 2 assessment, a pipeline "Interconnector" has been selected as the preferred option to transfer water from the River Severn to the River Thames.

Due to the risk of concurrent low flow periods in both river catchments, additional sources of water, apart from those naturally occurring in the River Severn, have been identified to augment the baseline flows. These multiple diverse sources of additional water provide resilience in the provision of raw water transfer to the River Thames. A 'put and take' arrangement has been agreed in principle with the Environment Agency (EA) and Natural Resources Wales (NRW) which means that if additional source water is 'put' into the river, then the Interconnector can 'take' that volume, less catchment losses, regardless of the baseline flows in the River Severn itself.

The regional planning process will determine the volume, timing, and utilisation of water to be transferred. The diversity of sources means they can be developed in a phased manner to meet the ultimate demand profile as determined by the regional planning. These additional sources of water are being provided by United Utilities (UU) and Severn Trent Water (STW) who are working in collaboration with Thames Water (TW) to develop this solution. The additional sources are:

- **Vyrnwy Reservoir**: Release of 25Ml/d water licensed to UU from Lake Vyrnwy directly into the River Vyrnwy;
- **Vyrnwy Reservoir**: Utilisation of 155Ml/d water licensed to UU from Lake Vyrnwy and transferred via a bypass pipeline ("Vyrnwy Bypass") to the River Severn;
- **Shrewsbury**: Diversion of 25Ml/d treated water from UU's Oswestry Water Treatment Works (WTW) via an existing emergency transfer (the Llanforda connection), thus enabling a reduction in abstraction from the River Severn at Shelton WTW to remain in the River Severn for abstraction at Deerhurst;
- **Mythe**: 15Ml/d of the Severn Trent Water licensed abstraction at Mythe remaining in the River Severn for abstraction at Deerhurst;
- **Minworth**: The transfer of 115Ml/d of treated wastewater discharge from Severn Trent Water's Minworth Wastewater Treatment Works (WwTW) via a pipeline, to the River Severn via the River Avon at Stoneleigh; and
- **Netheridge**: The transfer of 35Ml/d of treated wastewater discharge at Severn Trent Water's Netheridge WwTW to the River Severn at Haw Bridge, via a pipeline, upstream of the current discharge to the River Severn.

The STT Gate 1 submission was assessed by the Regulators' Alliance for Progressing Infrastructure Development (RAPID) who concluded that it should progress to standard Gate 2. The recommendations and actions received from RAPID and feedback from stakeholders from the Gate 1 process have been reflected in the scheme development and environmental assessments.

1.1.2   Gate 1

The STT Solution was subject to a detailed assessment in Gate 1 with the objective of delivering regulatory assessments of potential environmental effects of the Solution in the context of the All Company Working Group (ACWG) guidance. This methodology is aligned to the Water Resources Planning Guideline: Working Version for Water Resource Management Plan 2024 (WRMP24) so that there is a consistent approach to evaluating potential effects on environmental aspects.

At Gate 1, using the information available, the environmental appraisals did not identify any 'material issues', i.e. any unsurmountable obstacles that mean the scheme is unfeasible due to environmental reasons, at this stage. Both beneficial and adverse effects have been identified, which is to be expected given the scale of the scheme.

These conclusions were reached in the context of identified gaps in understanding, and the stated need for further data and evidence collection to support the Gate 2 investigations, further information on the operation of the scheme, and ongoing dialogue with regulators and other stakeholders.

1.1.2.1 Regulator feedback at Gate 1

Feedback from the regulators was sought before the submission of the Gate 1 submission and incorporated where possible. The environmental regulators also gave feedback as part of their formal Gate 1 review of the scheme. This feedback has informed the approach taken for Gate 2.

1.1.3 Gate 2

The ACWG guidelines set out that Gate 2 builds on Gate 1 activities to improve the detail and breadth of studies for a key decision point for strategic solutions. This will include concept solution designs with reduced uncertainty in costs and benefits and re-testing in revised regional and company models (to support updated decision making and filtering on outputs including those that are mutually exclusive).

At the end of Gate 2, the solution should be developed to a standard suitable for submitting into final regional plans and/or final WRMPs. In this context, this stage (Gate 2) of the programme aims to further enhance the funding portfolio, based on refined and consistent costs and benefits, with suboptimal solutions eliminated and viable solutions carried forward to the pre-planning stage.

To support the programme, the potential environmental effects associated with the STT Solution identified in Gate 1 will be considered in view of updated scheme design, changes in potential operational patterns, feedback on Gate 1 assessments from various regulators and stakeholders and further data gathering, modelling and assessment work completed since the publication of the Gate 1 assessment report[1].

RAPID issued a guidance document[2] in April 2022 to describe the Gate 2 process and set out the expectations for solutions at standard Gate 2.

The guidance stated the environmental assessment methodologies should be consistent with any relevant legislation and guidance, and follow best practice. This includes, where relevant, Water Resource Management Plan (WRMP) guidance for 2024, All Company Working Group (ACWG) guidance[3] and the Environment Agency Invasive Non-native Species risk assessment tool.

1.1.3.1 Overview of the environment assessment approach for Gate 2

Figure 1 shows the investigations undertaken for Gate 2 and their interactions, in order to show the full scope of work across both environmental engineering disciplines. Reporting for the environmental investigations is undertaken in a phased way. The Evidence reports (pale blue box in the figure below, and this report) are produced first, that set out the data and evidence to be used in the assessment. The Assessment Reports which use the evidence to determine the potential effect of the STT scheme on the different topics, is produced later (dark blue box in the figure below). Together with other inputs, these reports feed into the production of the statuary reports and summary reports (yellow boxes).

1.1.3.2 Regulator engagement for Gate 2

In order to engage with regulators over the approach, evidence collection, monitoring programmes, and data analysis for Gate 2, the environmental assessment team have held monthly meetings with the EA, NRW and NE, in addition to topic-specific sessions and workshops with technical specialists. The regulators are asked to provide insights and inputs on specific aspects where needed in order to ensure the work undertaken is as robust as possible.

In the monthly meetings, the programme, progress and deliverables are reviewed; issues are raised for clarification and resolution, and the regulators are asked for their views and advice on different topics or issues.

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[1] United Utilities - Water Transfers – RAPID Gate 1 Submission
[2] RAPID (2022) Strategic regional water resource solutions guidance for Gate 2
[3] All Companies Working Group (2020) WRMP environmental assessment guidance and applicability with SROs

In the sessions with technical specialists, each of the proposed approaches to the topics and statutory reports have been set out and explained. Drafts of documents have been issued, plus other technical notes, to the regulators to solicit feedback on the proposed approaches. Feedback on the drafts has been used to inform the wider environmental assessment for Gate 2 and finalise the approach and reporting.
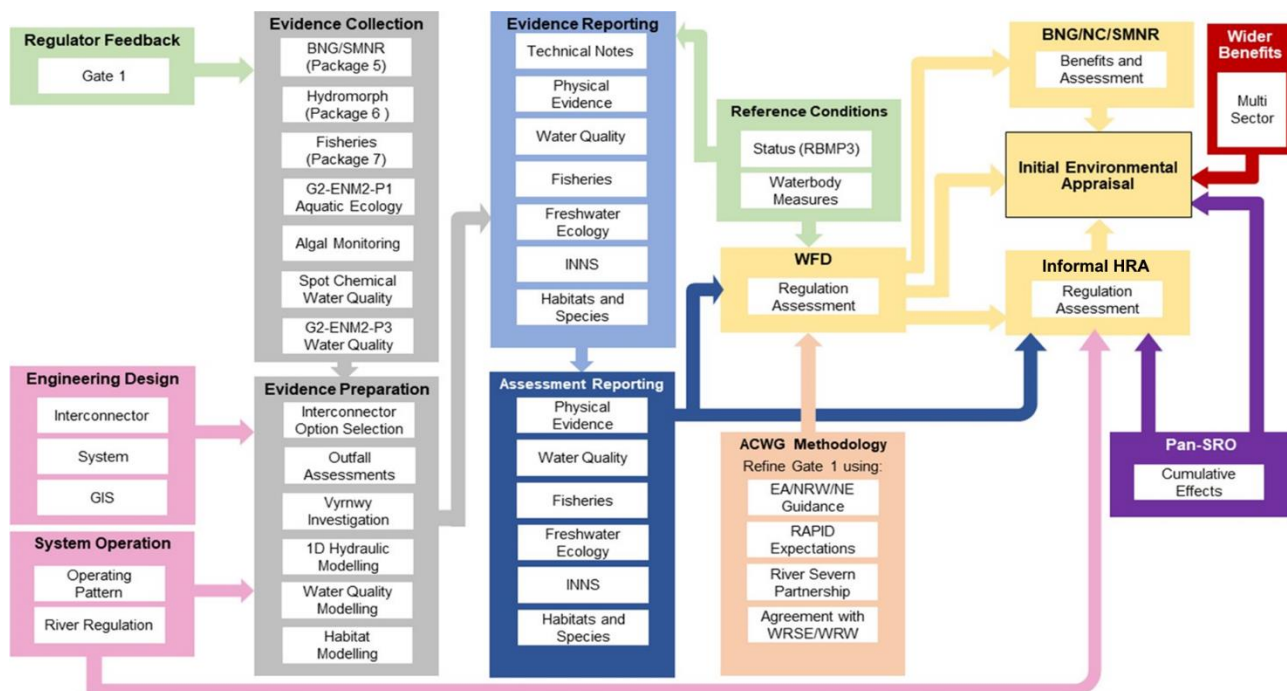
Figure 1 Flow chart showing the investigations undertaken for Gate 2 and their interactions

1.2 STUDY AREA

The Gate 2 assessment covers specific reaches and pipeline routes, as shown in **Figure 2**:

1. The River Vyrnwy catchment (River Vyrnwy from Vyrnwy Reservoir to the confluence with the River Severn);

2. The River Severn catchment (River Severn from the confluence with the River Vyrnwy to the Severn Estuary), as well as those tributaries of the River Severn which could indirectly be affected by the operation of the STT solution;

3. The Warwickshire River Avon upstream of Warwick to the River Severn confluence; and

4. The River Thames catchment (River Thames from Culham to Teddington Weir).

It should be noted that the consideration of impacts in the River Tame and Trent, from the transfer of treated discharge from Minworth WwTW to the River Avon, is included in the ST Minworth Solution and therefore excluded from the STT scheme assessment.
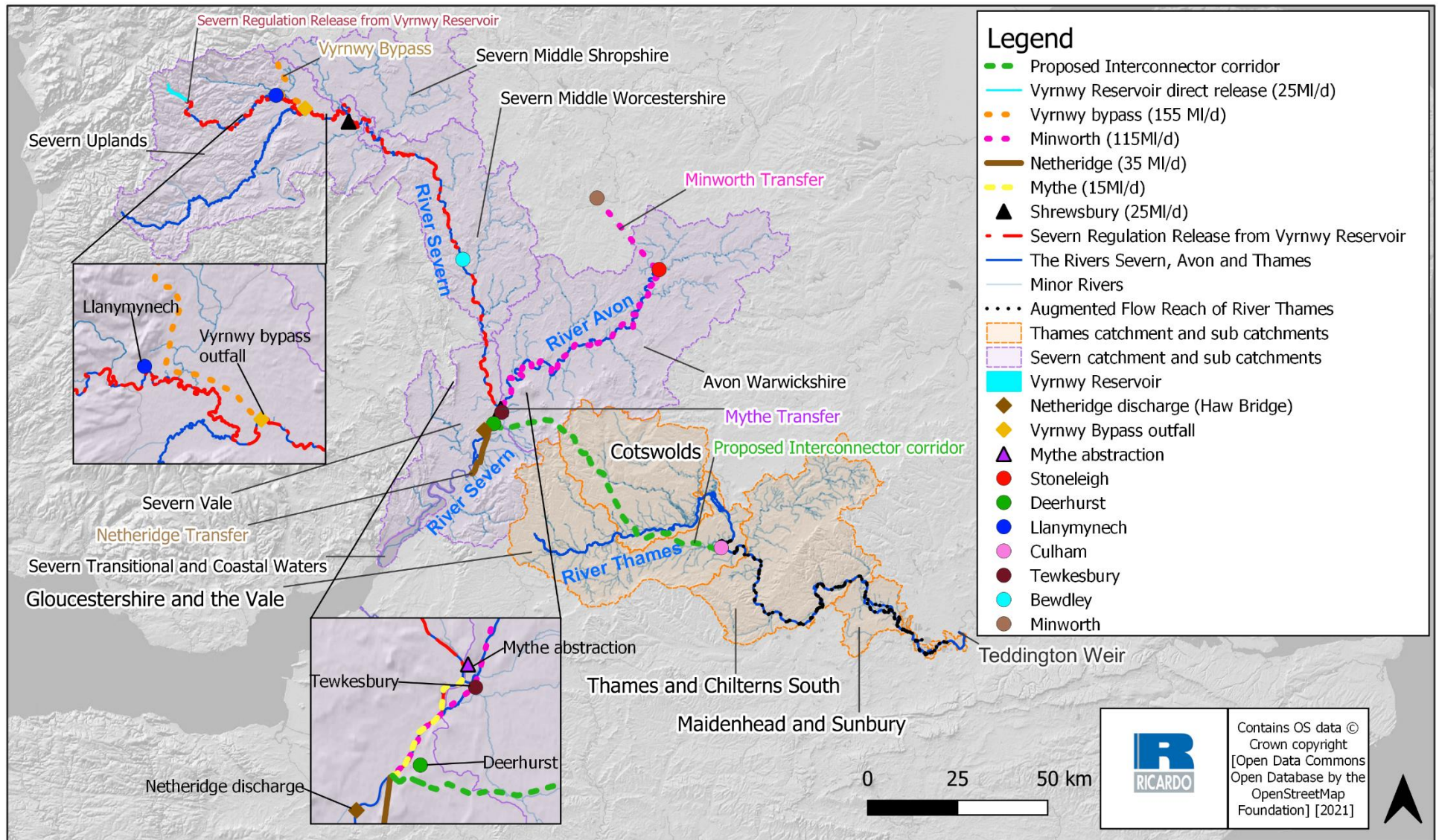
Figure 2 Map showing the proposed interconnector corridor

1.3   AIM OF THIS REPORT

The mandatory requirement is to achieve at least a 10% BNG increase from the pre-development biodiversity value. The requirement is framed as a pre- commencement condition, meaning that the biodiversity gain condition must be discharged before development can begin. It is underpinned by the Environment Act that offers new powers to set new binding targets, including for water and biodiversity.

The assessment of any biodiversity and wider net gain value of the impacted land/reaches as a result of the construction and operation of the proposed STT Solution, and biodiversity resilience and environmental ambitions within the locality, should be considered and used to support the identification of best value solutions.

This report provides the **evidence** (see Section 2) and **data catalogue** (see Section 3) used to inform the assessment of the baseline biodiversity and wider net gain value, and biodiversity resilience and environmental ambitions within the locality of the proposed STT Solution. The report identifies the **remaining data/evidence gaps** (Section 4), provides a summary of the proposed programme of works and approach to address any data/evidence gaps as part of RAPID's gated assessment process for the Solution as related to the workshop evidence (see Appendix 2). The data included here are those specifically collated for the assessment outlined as required for the All Company Working Group (ACWG) approach.

Note: There is a parallel piece of work that has been undertaken that focuses on the potential wider benefits and opportunities of the STT scheme, called the Wider Benefits Study. The wider benefits and opportunities work will draw on the data set presented here and also draw on other Ecosystem Service and wider '6 capitals' related data sets.

The biodiversity resilience and net gain opportunities will underpin the Natural Capital (NC) & Biodiversity Net Gain (BNG) (England) assessment and the ecosystem resilience, well-being & sustainable management of natural resources SMNR (Wales) assessment.

2. EVIDENCE BASE FOR, AND APPROACH TO, THE GATE 2 ASSESSMENT TASKS

Gate 1 of the STT Solution identified several open-source datasets which formed the evidence base for the environmental assessment. This provided data on habitat type and extent for areas within the scheme's indicative construction corridor, and areas likely to be affected by the operation of the STT Solution. The desk study included a high-level assessment of opportunities for biodiversity net gain (BNG) and Natural Capital (NC) (England) and Sustainable Management of Natural Resources (SMNR) (Wales), Environment (Wales) Act 2016 (Section 6) (Wales) and Well-being of Future Generations Act 2015 (Wales).[4]

In Wales, information from the Biodiversity Information Service (BIS) for Powys, such as the Network Opportunity Maps and Nature Recovery Action Plan, provided information for terrestrial habitat and wetland habitat opportunities. Data on priority river habitats for restoration were used to identify potential reaches for focusing opportunities.   The BIS database was searched for relevant information on priority sites for conservation.

For opportunities in England, Biodiversity Opportunity Area (BOA) maps and spatial data were sourced and used to identify river habitats within 1 km of each STT scheme element. Similarly, Area Statements, Green Infrastructure datasets, Wales Water Watch and Network Opportunity Maps were sourced for Wales and, where applicable, data was mapped into a Geographical Information System (GIS).

The Gate 1 process also identified several areas where additional data would be required to undertake the assessments during Gate 2. Gate 2, therefore, involves a wider desk study, plus stakeholder consultation with the environmental regulators of England and Wales to improve the evidence base of the baseline assessment and opportunities. Surveys have been undertaken since Gate 1 to collect data and improve the baseline understanding of terrestrial and riverine habitats, and river condition through UK Habitat Condition[5] and River Modular River Physical (MoRPh) surveys. The ancillary environmental data and assessments undertaken for Gate 2 will also be reviewed for relevant information to this assessment. The evidence associated with the ancillary environmental assessments are provided in separate documents, namely those for Habitats, Protected Species, Water Quality, Physical Environment, Macroinvertebrates, Invasive Non-native Species and Fisheries.

For Gate 2, the additional evidence builds on the information that has been collected and assessed at Gate 1, providing additional detail on the baseline and opportunities. The assessment performed at Gate 1 will be updated using these new datasets and other evidence, namely, knowledge inputs from stakeholder engagement. The Gate 1 assessment will also be revised to account for a more detailed scheme design, where information is provided.

The Gate 1 assessment for BNG in England was based on using the Defra Biodiversity Metric Tool version 2.0; for Gate 2 version 3.0 will be used. The Defra Tool provided the outputs with which the NC assessment was undertaken covering both the monetised and non-monetised assessment of a range of key ecosystem services. It should be noted that this Tool and associated Ecosystem Service assessment will also be used for comparative purposes across England and Wales, but that a specific study of Biodiversity Resilience/SMNR will also be undertaken for Wales.

The Gate 2 assessment will incorporate detail with which to support the overall SMNR and Well-being for Future Generations Act (2015)[6] requirements. It will also clearly flag where it will be necessary to consider and take forward key elements to Gate 3, such as additional stakeholder engagement and further data collection required.

The following sections outline:

1. The scope, approach and data sources (evidence) for assessment tasks that will be undertaken;
2. A summary of the data (Section 3.1) collected for each task in Gate 2 from the:

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[4] Note: the work presented here does not include details of the wider (and separate) Benefits Assessment study.

[5] UK Habitat Classification Working Group (2018). *UK Habitat Classification User Manual* at http://ecountability.co.uk/ukhabworkinggroup-ukhab
http://www.ieem.net/data/files/Resource_Library/Technical_Guidance_Series/GPEA/GPEA_July2012_web.pdf

[6] *https://gov.wales/sites/default/files/pdf-versions/2021/6/3/1623854132/well-being-future-generations-act-essentials.pdf*

      a.   desk review

      b.   survey data;

      c.   stakeholder workshops;

      d.   and review of SEA/HRA/Hydro-ecology/ Protected Habitats and Species assessments; and

3.   A summary of further data requirements following the Gate 2 assessment (Section 4).

2.1 SCOPE AND APPROACH TO THE GATE 2 ASSESSMENT AND EVIDENCE BASE

The scope of the assessment required for Gate 2 and the approach to undertaking the assessment is described in **Table 2-1**. This Table also includes a summary of the evidence base that will be used to inform the assessment. The data that informs the baseline, i.e. the understanding of the habitats within the potentially affected areas, will be used to inform the BNG (England) and Biodiversity Resilience/SMNR (Wales) assessments. Data on opportunities will be used to inform where there is potential for compensation and BNG (England); and for improvement to biodiversity resilience (Wales). The data on opportunities will also be used to identify areas of greatest benefit for the NC (England) and SNMR (Wales) assessments, and identify where these coincide with those opportunities identified for biodiversity, thereby geographically identifying locations for multiple benefits.

The evidence base comprises the desk study data sources, relevant survey locations and data, raw data, plus key points from the stakeholder meetings. It is summarised in the supporting Excel workbook (filename: "*STT_G2_BiodiversityEnvAmbitionEvidenceWorkbook"*). These data were also used to inform the extent of any remaining data/evidence gaps that would result in uncertainty in the assessments of biodiversity resilience and environmental ambition.

The Excel workbook includes the following information on separate tabs of the spreadsheet:

- **GIS data review and sources**: A list of data sources, and links to these data

Note: GIS shape files have been obtained for all the desk study and policy data sources above and are presented in a series of maps within Appendix 1. Mapped outputs from the stakeholder workshops will be detailed in the Assessment Report for Biodiversity Resilience and Environmental Ambition.

- **Policy review and data:** A summary review of Local Neighbourhood and County level Plans, River Basin Management Plans, Catchment Management Plans, WFD, Nature Improvement Areas, National Priority Focus Areas and the UK Tree Strategy

- **Protected Habitats survey data:**
  - *Summary report*: A briefing note of the Protected Habitats surveys undertaken in August and September 2021
  - *Transect survey details*: The transect survey locations and methodology for the surveys
  - *UKHab and condition*: Survey data, including habitat types and overall condition
  - *Condition scores*: Habitat condition data
  - *UKHab summary:* areas of the different habitats surveyed

- **River MoRPh survey data:**
  - *Survey locations*
  - *Results*: negative and positive indicators and preliminary score per site

Note: Survey data will refine the baseline data from open-source data sets and condition scores used to refine the assessment of BNG (England) and biodiversity resilience (Wales).

- **Stakeholder workshops:**
  - *Workshop questionnaires*: Responses from the questionnaires on opportunities and environmental ambitions

Note: Meeting notes and key actions/information from the stakeholder workshops are provided in Appendix 2. Collectively, this provides a summary of the related stakeholder views and comments received to date.

Table 2-1 Approach and evidence to be used for Gate 2 Biodiversity Resilience and Environmental Ambition assessment task

Task item	Scope of assessment	Approach to assessment	Evidence Base for Task
a. BNG (England) and Biodiversity Resilience and Environmental Ambitions (Wales)	• Desk review of data sources to refine the baseline and identify strategic opportunities	• Use data to update the baseline assessment of habitats for the BNG/Biodiversity Resilience assessment, which underpins the NC/SNMR assessment.	• Data sources as listed in the supporting Excel workbook "*STT_G2_BiodiversityEnvAmbitionEvidenceWorkbook"* in the tab 'GIS data review sources'. Those relevant for England and Wales can be selected from the drop-down menu. • Mapped outputs as shown in Appendix 1. • Summary provided in Section 3.1.1.
	• Habitat and river morphology surveys to refine the baseline and identify strategic opportunities	• Undertake targeted surveys to refine the identification of habitat type and condition along the proposed pipeline routes and impacted reaches of watercourses using standard survey methodologies.	• Survey locations as listed in the supporting Excel workbook in the tabs 'Transect survey details' and 'River MoRPh survey locations'. • The results of the priority habitat surveys are presented in a separate report '*STT_G2_Evidence Report_Protected Habitats*' and accompanying workbook. • Summary provided in Section 3.1.2 and 3.1.3
	• Stakeholder workshops: three workshops held with stakeholders	• Hold workshops to discuss the information requirements for Gate 2, and gather information on opportunities through a structured questionnaire and follow-up workshop to discuss the results in more detail. Hold a third workshop to discuss the findings and identify the locations of greatest opportunity.	• Data provided to support the workshops included maps of a 5km buffer along the pipeline routes and impacted river reaches. • The key discussion points from Workshop 2 are provided in Appendix 2. • Recordings and transcripts from the workshop session are provided as files in BNG NC SMNR Workshop 2 Recordings • Summary provided in Section 3.3
	• Review of relevant IEA/HRA/Protected Habitats and Species and Hydro-ecology data	• Review the ancillary environmental assessment reports for relevant information with which to refine the baseline assessment of habitat/river condition and identify opportunities to deliver cross benefits.	• The ancillary environmental assessment and statutory reports (Protected Habitats, Protected Species, Water Quality, Physical Environment, Macroinvertebrates, Invasive Non-native Species and Fisheries, IEA, HRA and WFD)
	• Update Gate1 BNG calculations for each scheme component and	• Recalculate the BNG score for each scheme component and/or option in order to include updated data following the UKHab, MoRPh, and associated condition assessments surveys, and baseline data from the desk study. • Undertake further assessment of Biodiversity Resilience (Wales)	• Above data sources on the baseline habitats from the desk study • Analysis using the Defra metric 3.0[7] (England) • SMNR principles for Building Resilience[8]
b. Natural Capital Assessment (England)	• Update baseline data, monetised and non-monetised assessments	• Recalculate the monetised and non-monetised Ecosystem Service assessments related to the updated BNG assessment for each scheme component and / or option to include the updated data sources based on the results of the	• Data sources as listed in the supporting Excel workbook "*STT_G2_BiodiversityEnvAmbitionEvidenceWorkbook"* in the tab

[7] http://publications.naturalengland.org.uk/publication/6049804846366720

[8] Natural Resources Wales (undated) Introducing Sustainable Management of Natural Resources. Available from: Introducing Sustainable Management of Natural Resources https://naturalresources.wales/media/678317/introducing-smnr-booklet-english.pdf

Task item	Scope of assessment	Approach to assessment	Evidence Base for Task
	to include the survey results • Update Gate1 monetised and non-monetised assessments for each scheme component • Quantitative and qualitative assessments of mitigation and enhancement opportunities	UKHab, MoRPh, and associated condition assessments surveys. • Hold workshops to discuss the information requirements for Gate 2, to (1) gather information on opportunities through a structured questionnaire; (2) follow-up to discuss answers; and (3) discuss the findings and identify the locations of greatest opportunity.	'GIS data review sources'. Those relevant for England and Wales can be selected from the drop-down menu.
c. Sustainable Management of Natural Resources and wellbeing goals (Wales)	• Update baseline data to include the survey results • Update Gate 1 assessments for each scheme component	• Reassess the baseline data for each scheme component and / or option to include the updated data sources based on the results of the UKHab, MoRPh, and associated condition assessments surveys. • Local Area Statements and baseline data will be used to provide a RAG-type rating linked to the SMNR principles and well -being goals. • Hold workshops to discuss the information requirements for Gate 2, to (1) gather information on opportunities through a structured questionnaire; (2) follow-up to discuss answers; and (3) discuss the findings and identify the locations of greatest opportunity.	• Data sources as listed in the supporting Excel workbook "*STT_G2_BiodiversityEnvAmbitionEvidenceWorkbook*" in the tab 'GIS data review sources'. Those relevant for England and Wales can be selected from the drop-down menu.

3. DATA (SUMMARY OF DATA COLLECTED FOR GATE 2)

3.1 BIODIVERSITY NET GAIN AND BIODIVERSITY RESILIENCE

3.1.1   Desktop review

Relevant national GIS datasets were downloaded and clipped to a 5km buffer. Datasets were assessed and found to be relevant to the desktop review if the dataset showed, for example, current land use, status of land/watercourses, land/watercourse designations (statutory and non-statutory) and land ownership. Local records centres operating within the 5km buffer were approached for their records of 1) Local Wildlife Sites, 2) priority hedgerow habitats, and 3) priority arable field margin habitats.

The complete list of relevant, mappable plans at the local, County and Neighbourhood level together with River Basin Management Plans, national GIS datasets, and records obtained from local records centres are provided in the tab 'GIS data review sources' in the supporting excel workbook.

As part of the desktop study, a review was undertaken of any specific plans/polices relating to land allocations, biodiversity and environmental ambitions for each source option, as summarised in the tab 'Policy review' in the supporting excel workbook. Each STT scheme element was filtered into the relevant county it passes through.   Detailed web searches were then undertaken to identify any policies related to Local, and Neighbourhood Plans etc River Basin Management Plans, Catchment Management Plans and specific habitat strategies within the local area. This desktop study builds on the data collected at Gate 1 with the focus on identifying any policies relating to biodiversity opportunities, such as Biodiversity Opportunity Areas (BOAs) and requirements for biodiversity mitigation. The desk study identified the relevant plans which will need to be considered at Gate 2 and discussed with relevant stakeholders at the final workshop.

In addition to data captured at Gate 1, the desktop review identified plans at local, neighbourhood and county level within a 5km buffer of the proposed routes (as of January 2022) which included any relevant details of land, within the area to which the plan relates, currently identified for a particular purpose or land identified for potential biodiversity improvements. This included, but is not limited to, land identified for housing development, mineral safeguarding, employment safeguarding, or for biodiversity / 'green' development. River Basin Management Plans were also reviewed for any relevant information that could be mapped, for example catchment areas targeted for natural flood management. Once these land parcels were identified, a GIS file was either downloaded from the relevant website or produced by digitally tracing the provided plan maps using GIS software (QGIS).

Overall, the available data is considered sufficient with which to undertake the Gate 2 assessments.

3.1.2   UKHab and condition surveys

The targeted surveys for the terrestrial habitat surveys were based on the following STT scheme elements:

- River Vyrnwy Mitigation;
- Canal Conveyance;
- Minworth STW effluent diversion;
- Netheridge STW effluent diversion; and
- Pipeline Conveyance – Deerhurst to Culham.

As part of the Gate 1 assessment, Ricardo established a GIS database with each element route mapped including the construction buffer zones. The BNG assessment at Gate 1 indicated that the largest broad habitat types across all proposed pipeline routes were broadleaved woodland and neutral grassland[9]. As the assessment at Gate 1 was purely based on desk study data, a sampling survey was designed in which 20% of grassland and woodland habitats were surveyed to improve the baseline data and ground truth the existing data sets regarding condition and type of habitat. This was based on a percentage figure considered appropriate to provide a satisfactory initial indication of the true habitats represented within each element within the timeframes available between Gate 1 and Gate 2. The main aim of this field work collection at this stage is to allow comparison of key elements without surveying entire routes.

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[9] Based on the surveyed data, modified grassland habitat has been assigned to sites that was assessed as neutral grassland. As part of the Gate 2 assessment, the habitat assumptions will reflect the field data collected. Outputs will be provided in the assessment reporting.

Priority habitats within the construction zone of scheme elements which were over 1ha in size were also targeted for surveys, to confirm whether the priority habitat was still functioning and determine the current condition. The results of the priority habitat surveys are presented in a separate report '*STT_G2_Evidence Report_Protected Habitats*'. The following provides a summary of the sampling strategy that underpins the evidence outputs.

An assessment of accessibility was undertaken using open-source public footpaths and public roads plotted on GIS. These were used to determine the location of a series of survey transects designed to cover 20% of the broad habitat types within each of the proposed scheme elements, and priority habitats over 1ha in size. In total 22 transects were designed. The length of the transects, location and relevant element is presented in the supporting excel workbook, along with metadata for the UKHab and condition assessments.

Habitats in each transect were recorded and mapped broadly following standard methodology published in the UK Habitat Classification (UKHab) User Manual[10] and Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines for PEA[11]. Any incidental sightings or indirect evidence of protected or notable species presence were also recorded, but no detailed survey for any species was undertaken.

Habitat condition was assessed using the Biodiversity Metric 3.0 technical supplement (Panks *et al.*, 2021a)[12]. The Gate 1 assessment made an assumption that all habitats were of 'moderate' condition therefore a specific condition assessment of 20% of broad habitats was undertaken. Habitat condition is a score based on the quality of the habitat, judged against the perceived ecological optimum state for that particular habitat. The process of assessing habitat condition considers how many of the key physical characteristics and typical species of a particular habitat type are present in the survey patch, as determined by condition criteria.

The results from the UKHab surveys are shown in the tabs 'UKHab and condition', 'Condition scores' and 'UKHab summary'. The Excel workbook shows each transect with the habitats that were assessed: the Gate 1 desk study data and the actual habitat recorded on site, along with the condition assessment. A common trend concerned land classified as 'pasture' from the desk study at Gate 1 which was translated to 'neutral grassland' when utilising the BNG metric: this land was reclassified as 'modified grassland' during the site based assessments. This reclassification will be applied throughout the whole assessment at Gate 2. Similarly, the identification of priority habitat coastal and floodplain grazing marsh, from the Natural England priority habitat inventory, was absent in the transects undertaken and instead the land was functioning as a non-priority habitat, such as other neutral grassland. During the Gate 1 assessments all habitats were assumed as being in 'moderate' condition due to the lack of any desk-based condition data.

The condition assessments show that the majority of habitats are classified as either 'poor' or 'moderate' condition. This is a typical representation of the British landscape with agricultural grassland habitat having more intensive management than natural or unmanaged grassland, and therefore functioning at a poorer condition.

3.1.3   River Modular River Physical (MoRPh)

Targeted MoRPh surveys were undertaken at a total of 17 locations. The central grid reference for each location is detailed in the supporting Excel file, tab 'River MoRPh – survey locations'. These locations were chosen as they were already part of wider work for the STT Gate 2 environmental assessment, representing key sites that could be most sensitive to changes in water quality, velocity, depth and habitat change associated with increases flows from the STT scheme.

The Site River Baseline comprises the watercourses within the construction (red line) boundary and the principles can be applied for the purpose of this assessment. The construction area is based on GIS data of scheme element pipeline locations and other structures. In order to calculate the approximate temporary river length loss during construction, aerial imagery and WFD waterbody data was used to count the number of watercourses intersected for each element. The number of structures for discharges/abstractions were also

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[10] UK Habitat Classification Working Group (2018). *UK Habitat Classification User Manual* at http://ecountability.co.uk/ukhabworkinggroup-ukhab

http://www.ieem.net/data/files/Resource_Library/Technical_Guidance_Series/GPEA/GPEA_July2012_web.pdf

[11] CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

[12] Stephen Panks, Nick White, Amanda Newsone, Jack Potter, Matt Heydon, Edward Mayhew, Maria Alvarez, Trudy Russell, Sarah J. Scott, Max Heaver, Sarah H. Scott, Jo Treweek, Bill Butcher and Dave Stone (2021). The Biodiversity Metric 3.0: Auditing and accounting for biodiversity value: Technical supplement (version, July 2021a). Natural England

counted. Main rivers greater than 2m in width were discounted, as directional drilling construction methods would be used for these watercourses, avoiding habitat loss. For watercourses less than 2m in width, an assumption was made that there would be temporary habitat loss along a 20m easement, which would then be re-instated. Further, the assumption was made that outfalls would result in permanent bank loss along an assumed 15m section. For the Gate 2 assessment, these assumptions will be checked to ensure they remain valid, and updated where necessary when further design information is available on the STT scheme

Condition information, required for the Biodiversity Metric, is based on data obtained through the River Metric Survey, a sub-reach scale field survey (i.e. the MoRPh survey). It should be noted that the Biodiversity Metric for rivers is also not currently designed to account for operational degradation, only direct impacts from construction.

A summary of the results of the River MoRPh surveys is presented in the tab 'River MoRPh – survey results' in the supporting Excel workbook.

A total of 17 MoRPh surveys were conducted: one on the Thames, one on Stroudwater canal, one on Thames and Severn Canal, three on the Vyrnwy, three on the Avon, and eight on the Severn. STT 1 was the only site that was assessed as being in 'Good' condition; this site is located on the River Vyrnwy. STT Maisemere, located on the River Severn, was the only site that was assessed as being in 'Fairly Good' condition. The majority of the sites were assessed as being in moderate condition (12) and two sites (STT 11 and STT 12), located on the River Severn in Gloucester, were assessed as 'Fairly Poor'.

3.2   NATURAL CAPITAL, SMNR, AND WELL BEING GOALS EVIDENCE

3.2.1   Desktop review

A high-level NC assessment was undertaken as part of Gate 1 (noting that in Wales this is referred to as natural resources accounting) to identify the potential NC benefits and disbenefits of the STT scheme's elements and associated groupings. At Gate 1, the required focus was to provide an NC baseline, including valuations (both spatially quantitative and monetised) where feasible.

The Gate 1 desk study assessed NC relating to the identified opportunity areas, via the Defra Biodiversity Metric Tool v2 calculations related to construction impacts. Socio-economic aspects (recreation and amenity) were included to provide a more holistic view of natural and associated social capital. This socio-economic element highlights the relationships between people and the affected environments, and how these relationships could change as a result of the scheme elements.

As for Gate 1, the Gate 2 NC assessment is related to a BNG calculator-derived assessment and the data sources used to value ecosystem services include the WRPG, ACWG Guidance, Defra's Enabling a Natural Capital Approach (ENCA) Guidance and, in some cases, the ONS Natural Capital Accounts Methodology 2019. Since Gate 1, there have been some refinements to the assessments of NC in the context of monetisation. The Gate 2 monetised assessments will be uplifted to 2022 prices to ensure all economic valuations for ecosystem services relate to the same time frame and are therefore comparable.

Recreation

The Outdoor Recreation Valuation Tool (ORVal)[13] is used to estimate recreation demand from existing or new greenspace as a proxy for recreation value. The values derived from the ORVal[13] tool are estimated using a Random Utility Model of travel cost estimates[14]. The values represent the total welfare lost if the site in question was to be removed.

In cases where components consist of more than one site, the marginal values of each site are aggregated based on the assumption that other sites that exist outside of the component scope are substitutes[15]. The welfare values are based on £2016 prices and will be uplifted by Ricardo to £2022 prices. The following rules have been applied for the assessment of recreation and tourism using the ORVal tool:

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[13] https://www.leep.exeter.ac.uk/orval/
[14] Day & Smith (2017) The ORVal Recreation Demand Model: Extension Project. Accessed via: https://www.leep.exeter.ac.uk/orval/pdf-reports/ORValII_Modelling_Report.pdf
[15] https://www.leep.exeter.ac.uk/orval/pdf-reports/ORVal2_User_Guide.pdf

- If the construction is located on the periphery of a recreation site and is judged to not affect any key attributes of the recreation site that would significantly impact visitor numbers, then the per ha average value of the recreation site has been applied to the area of construction;

- If the construction is located in or near the centre of the recreation site and/or is judged to affect key attributes of a recreation site that would significantly impact visitor numbers, then the whole site value is used;

- A conditional percentage has been applied to the footpath values depending on the number of footpath intersections present (and therefore alternative routes). For example:

  o If there are no intersections, and therefore no alternative routes, then 100% of the footpath value has been taken;

  o If there are 1-2 intersections present, then 50% of the value has been taken;

  o If there are 3-4 intersections present, then 25% has been taken;

  o If there are 5+ intersections present, then 10% of the value has been taken; and

  o In some cases where there are extensive footpath networks outputs have been determined as a single point only access to avoid unfeasibly high values.

As outlined above, the ENCA guidance, the Treasury's Green book and new supplementary guidance is used to support the monetisation of ecosystem services. This approach is completed for both England and Wales for comparison purposes across other Solutions and WRMPs, noting that additional bespoke work will be completed for Welsh area.

For the Welsh Area, the Welsh SMNR principles and Well-being of Future Generations (Wales) Act 2015 underpin the ecosystem assessment work. The key nine SMNR principles and the 7 well-being goals have been accounted for in the context of our overall data collection and workshops. More detail will be provided in the Assessment Report, but the data will be used to identify multiple benefits from a short and long-term perspective. These assumptions will be underpinned by our key data set evidence database which encompass a range of scales that have been mapped as shown in Appendix 1. In addition, in the context of building ecological resilience, we will specifically consider the five elements related to: ecosystem diversity, connectivity, scale, condition, and adaptability.

The evidence and knowledge take into account ground-truthed habitat condition data and input from the stakeholder workshops. The SMNR principles and well-being goals in terms of Ecosystem Services will be driven by key Welsh data sets related to habitat type and condition. These will be used to support the assessment of the building ecosystem resilience aspects. This will provide a baseline of habitat types and condition. A RAG-type rating will be provided related to the key principles and opportunities. To assess the wider benefits, we will take account of the local Area Statements to understand local ambitions.

3.3   STAKEHOLDER WORKSHOPS

Two out of three planned workshops have been held so far. The objectives of the workshops are to obtain data, evidence, and an understanding of any local ambition. To facilitate discussions, maps, infographic-displayed outputs, and remotely sensed imagery have been used. We built on the imagery completed for Gate 1 by updating routes, variable working widths, hydrological zones of influence, land types etc. Information derived from the workshops will feed into the assessment. The benefits assessment will be updated to account for both English and Welsh regulatory requirements.

The two workshops held in December 2021 and January 2022, sought to gain feedback on the biodiversity resilience and net gain opportunities approach for Gate 2 from regulators across England and Wales. The workshop participants included a range of representatives from technical disciplines, catchment co-ordination and national teams. A questionnaire was sent to the regulators to outline information required for further assessments after the first (December) workshop and the responses received were presented in the second (January) workshop. The workshops gathered other information from the stakeholders with which to refine the Gate 2 assessments. A summary of key points is provided in Appendix 2 with a link to the workshop recordings.

The workshops have identified key data sets, stakeholder views and opportunity areas. The key points arising were:

- *Timescales:* There is a lot of on-the-ground work that is being completed currently but more of this is focused on specific areas and on a short time scale. This is different to the STT scheme which is a longer term and strategic programme of work. It should be noted that what has been identified as current opportunities may already be completed by the time of detailed planning or implementation of this strategic scheme.
- *Other workstreams:* There are many workstreams that are also collating data to ascertain opportunities. The workshops identified some which will need to be pulled together as part of Gate 3 once there is more focus on key opportunity areas. It was also flagged that there is a lot of other work taking place within the study area related to strategic ambitions (e.g. nature recovery areas and local planning). Such data will not be available for 1-2 years in full. This information will need to be reviewed as part of Gate 3.
- *Data gaps:* It was agreed that a very comprehensive data set associated with this programme of work has been developed, with only a few data gaps identified.
- *HS2:* A lot of the area around Minworth falls coincidentally in the same area of opportunity as that associated with the HS2 programme. Much of the land in this area is already earmarked for net gain and hence wider opportunities will need to be sought.
- *Opportunities:* There are key groups working up catchment ambitions: liaison has been undertaken required with them.

The third and final workshop will be held to discuss assessment outputs, provide an update on progress in terms of a more focused identification of high level opportunities and areas of net environmental gain and resilience. Recommendations for Gate 3, especially around stakeholder recommendations, will be outlined in the Assessment Report.

4. UNCERTAINTY AND DATA GAPS

4.1 SURVEY DATA

Some access limitations have been encountered during the Protected Habitat surveys; however, it was possible to collect data from adjacent areas, with the exception of a particular area of oxbow lake habitat: more information on this can be found in the separate report: '*STT_G2_Evidence Report_Protected Habitats*'. This area would need to be visited, if permission is given by the landowner, to undertake Phase 1 habitat surveys and a hydrological connectivity walkover, should hydrological impacts be identified in the reach due to the STT scheme.

The river MoRPH surveys do not provide full coverage of the potential impacted river reaches and being single survey visits have not been undertaken in all flow conditions. However, this is not considered a significant limitation to the survey data to inform the Gate 2 assessment as River MoRPh surveys should be undertaken between May and September under low flow conditions according to the survey guidance. The surveys are to identify the habitats present and assess the condition to inform the Biodiversity Net Gain Assessment. Extended walkovers were undertaken of the Avon and Vyrnwy, and abstraction/discharge locations on the River Severn to identify representative sections to undertake the surveys such as Morph in representative sections of the watercourse (the details of the walkovers undertaken are presented in the Physical Environment Evidence report). Therefore, the single survey data set and incomplete coverage of the potentially affected reaches is not considered to be a significant limitation to the Gate 2 assessment.

4.2 STAKEHOLDER WORKSHOPS

The workshops (see Appendix 2) identified some additional data sources, which will be reviewed for relevance and analysed (where available) for the Gate 2 assessment. Few specific opportunities were identified due to the scale of the project at Gate 2. The strategic opportunities identified through the desk study will be used to inform a set of 'heat maps' in the Assessment Report for this topic, showing greatest opportunity for benefit, which will enable the targeting of specific areas for assessment at Gate 3.

APPENDICES

The following appendices are presented:

- **Appendix 1 Data Maps**
- **Appendix 2 Workshops**

APPENDIX 1 DATA MAPS

The following maps present data from the GIS sources listed in the workbook.

Map	Description
Figure 3 STT CORINE Land Cover - Map 1	CORINE Land Cover maps show standard classifications of land use within Europe which are derived from satellite images and interpretation. These maps show the latest CORINE data which is dated 2018.
Figure 4 STT CORINE Land Cover - Map 2	
Figure 5 STT CORINE Land Cover - Map 3	
Figure 6 STT CORINE Land Cover - Map 4	
Figure 7 STT Wales Phase 1	Phase 1 Habitat Survey mapping of Wales. The layer shown is 'Vegetation Voronoi' showing the boundaries of vegetation polygons and subdivided upland polygons. Note that there is no Phase 1 Habitat Survey data equivalent for England.
Figure 8 STT Opportunity Layers and Habitat Network - Map 1	Habitat Networks (England) shows the location of 18 priority habitat types in England and the associated distinct network zones where action may be undertaken to build greater ecological resilience. Habitat Networks (Wales) shows the location of seven habitats in Wales, along with three levels of habitat networks which can be used to guide large-scale planning for nature conservation.
Figure 9 STT Opportunity Layers and Habitat Network - Map 2	
Figure 10 STT Opportunity Layers and Habitat Network - Map 3	
Figure 11 STT Opportunity Layers and Habitat Network - Map 4	
Figure 12 STT Information from National Scale Datasets - Map 1	These maps present layers derived from national datasets including: watercourses classified as main rivers, Ordnance Survey rivers, Areas of Outstanding Natural Beauty (AONB), National Forest Inventory, habitat classified as open mosaic, Ordnance survey open greenspace, and priority river headwater areas habitat.
Figure 13 STT Information from National Scale Datasets - Map 2	
Figure 14 STT Information from National Scale Datasets - Map 3	
Figure 15 STT Information from National Scale Datasets - Map 4	
Figure 16 STT Priority Habitat - Map 1	These maps show the location of Natural Environment and Rural Communities Act (2006) Section 41 habitats of principal importance. Note that this dataset applies to England only.
Figure 17 STT Priority Habitat - Map 2	
Figure 18 STT Priority Habitat - Map 3	
Figure 19 STT Priority Habitat - Map 4	
Figure 20 STT Designated Sites - Map 1	These maps present the locations of a selection of statutory and non-statutory designated sites in England and Wales. Note that the SSSI Impact Risk Zone applies to England only.
Figure 21 STT Designated Sites - Map 2	
Figure 22 STT Designated Sites - Map 3	
Figure 23 STT Designated Sites - Map 4	

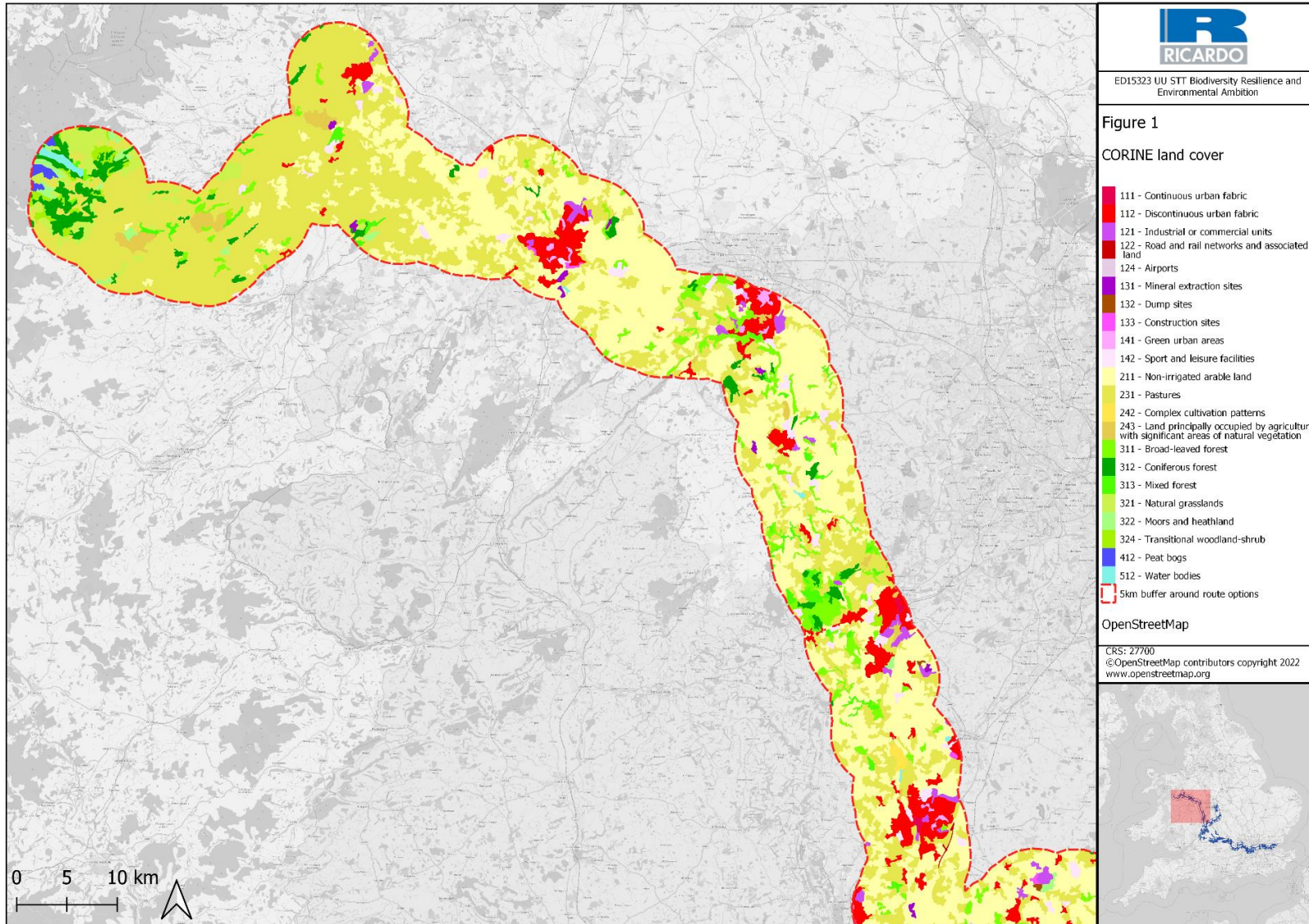| Map	Description
Figure 24 STT Non-designated Sites - Map 1	These maps present the locations of a selection of non-statutory designated sites in England and Wales.
Figure 25 STT Non-designated Sites - Map 2	
Figure 26 STT Non-designated Sites - Map 3	
Figure 27 STT Non-designated Sites - Map 4	
Figure 28 STT WFD and Air Quality data - Map 1	These maps present the locations of Water Framework Directive (WFD) Cycle 2 River, Canal and Surface Water, air quality management areas and areas at risk of flooding from rivers and seas.
Figure 29 STT WFD and Air Quality data - Map 2	
Figure 30 STT WFD and Air Quality data - Map 3	
Figure 31 STT WFD and Air Quality data - Map 4	
Figure 32 STT Flooding - Map 1	This map presents the locations of key communities most vulnerable to flood risk in Wales, top ten urban and rural communities at risk of flooding, flood risk areas along the Severn, natural flood management target areas, and flood risk areas along the River Humber.
Figure 33 STT Flooding - Map 2	
Figure 34 STT Council layers - Map 1	These maps present layers produced using published local authority information relating to land use allocations.
Figure 35 STT Council layers - Map 2	
Figure 36 STT Council layers - Map 3	

Figure 3 STT CORINE[16] Land Cover - Map 1

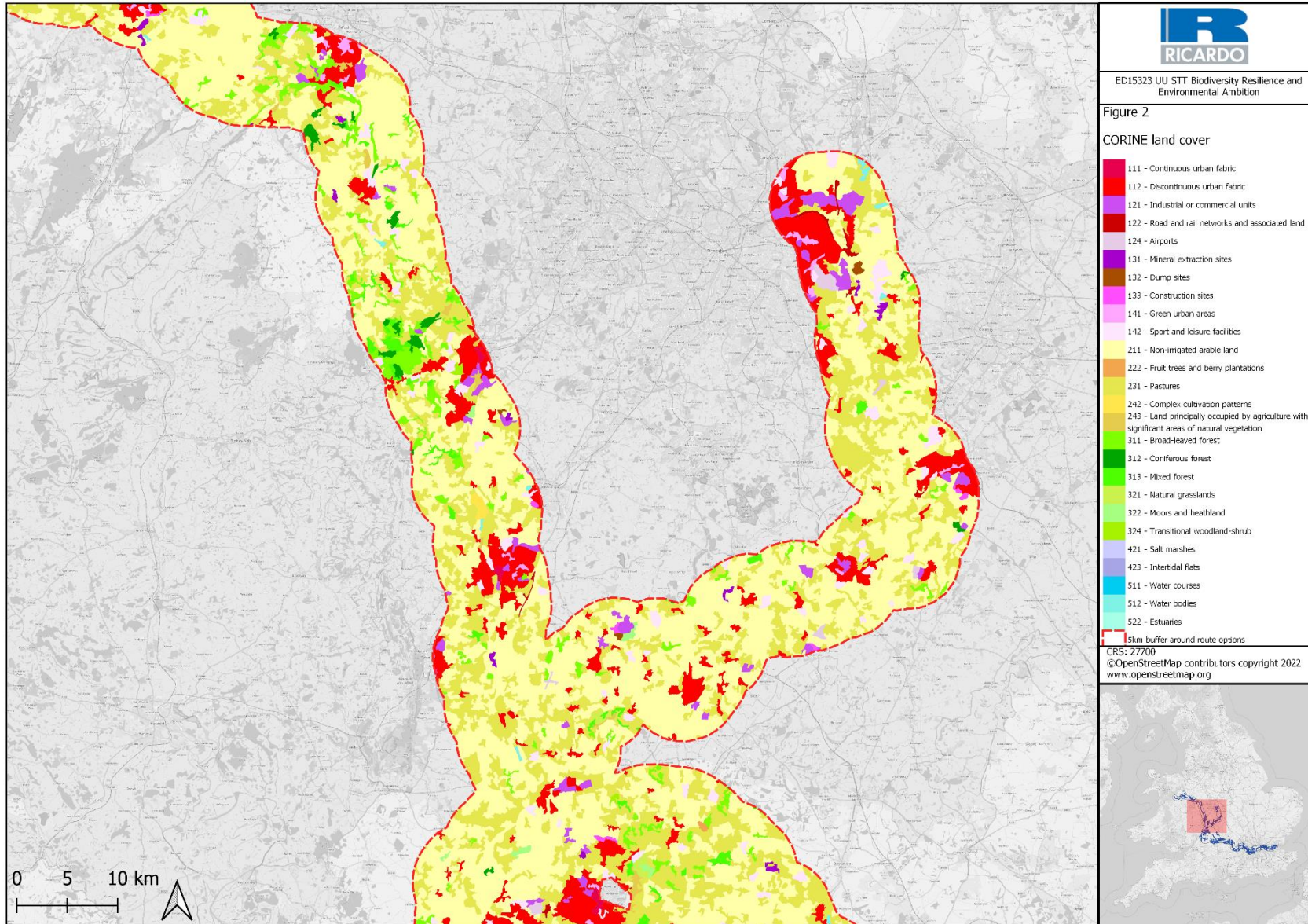[16] CORINE Land Cover — Copernicus Land Monitoring Service
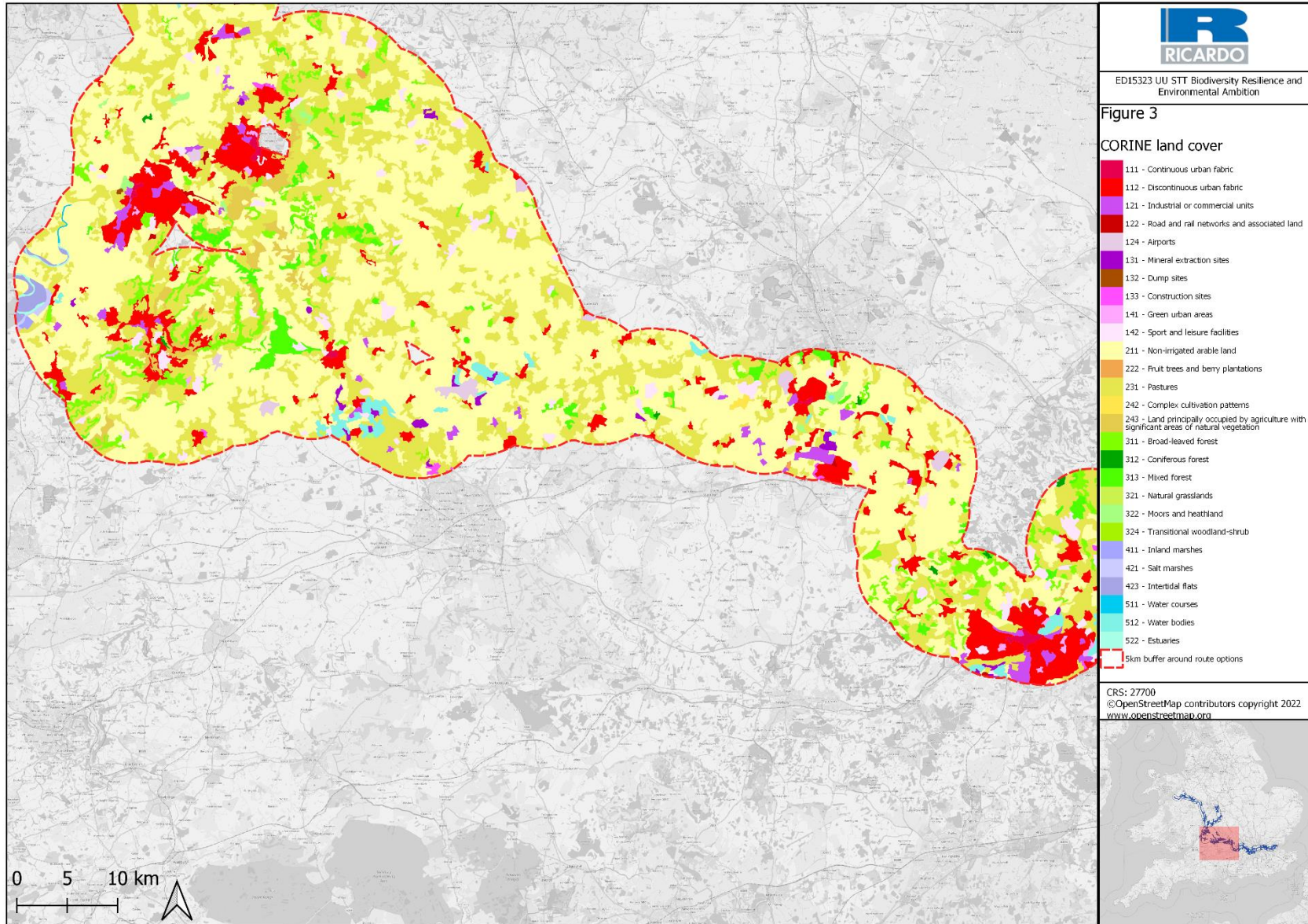
Figure 4 STT CORINE Land Cover - Map 2

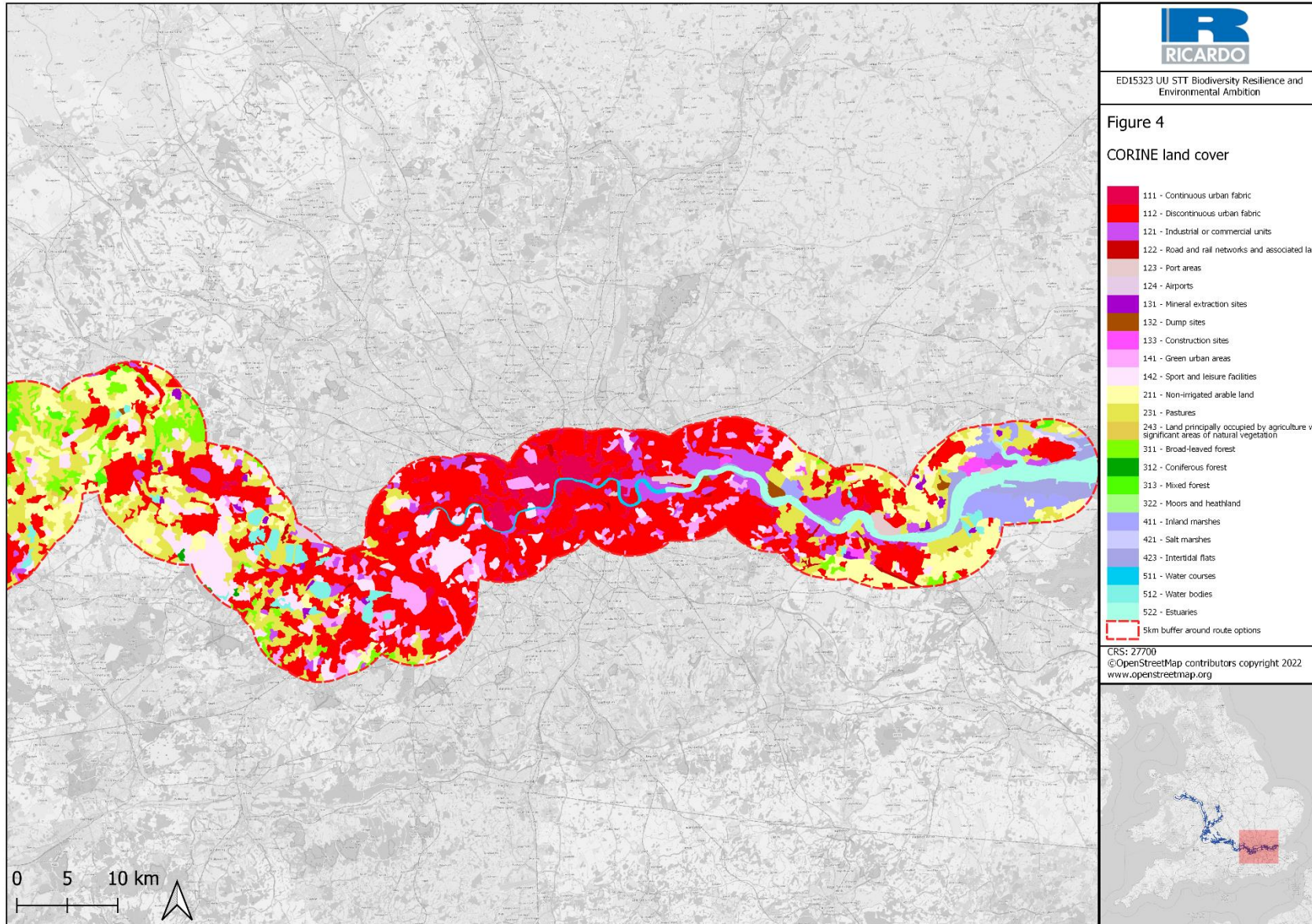Figure 5 STT CORINE Land Cover - Map 3

Figure 6 STT CORINE Land Cover - Map 4

Figure 7 STT Wales Phase 1 Habitat Survey
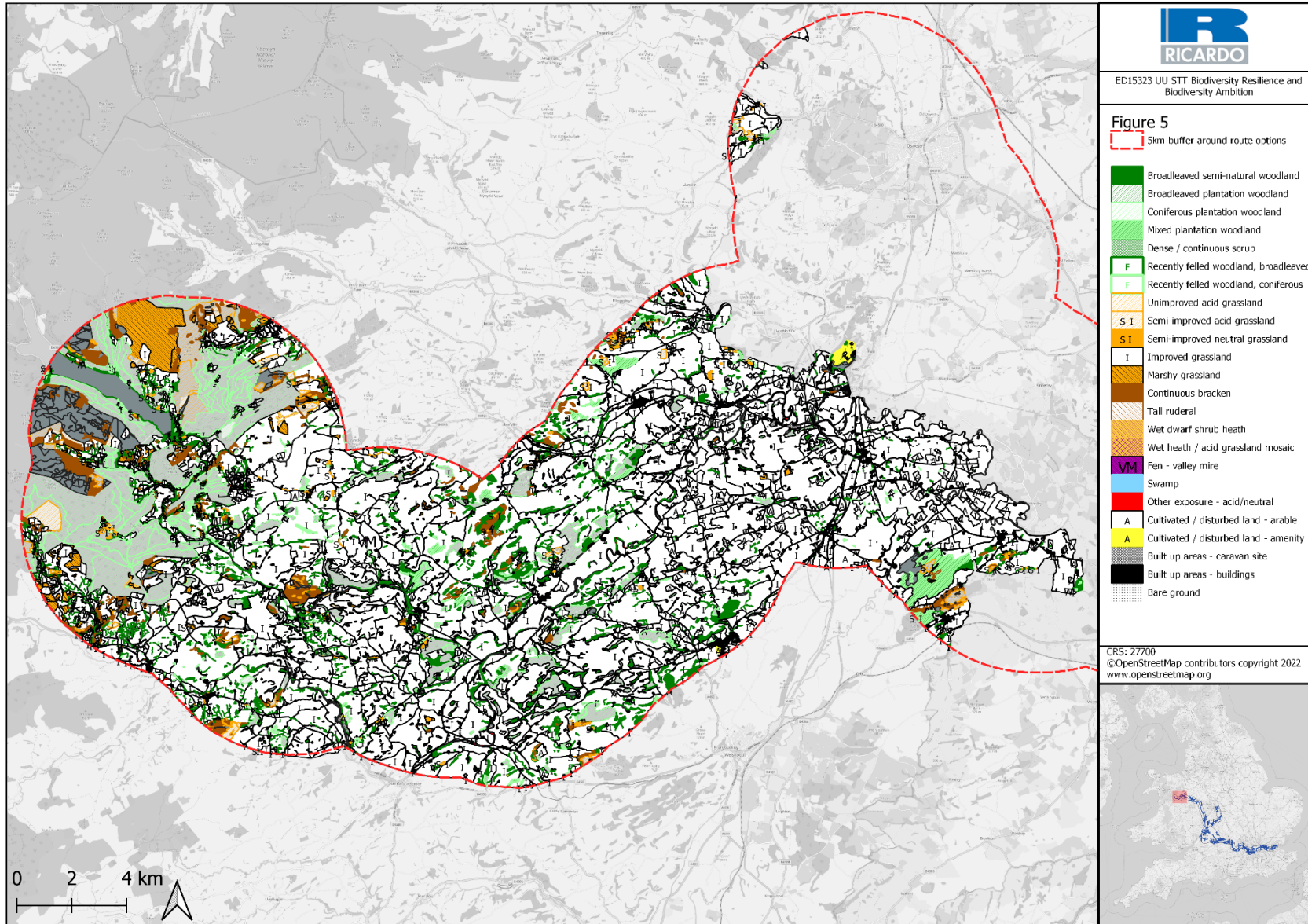
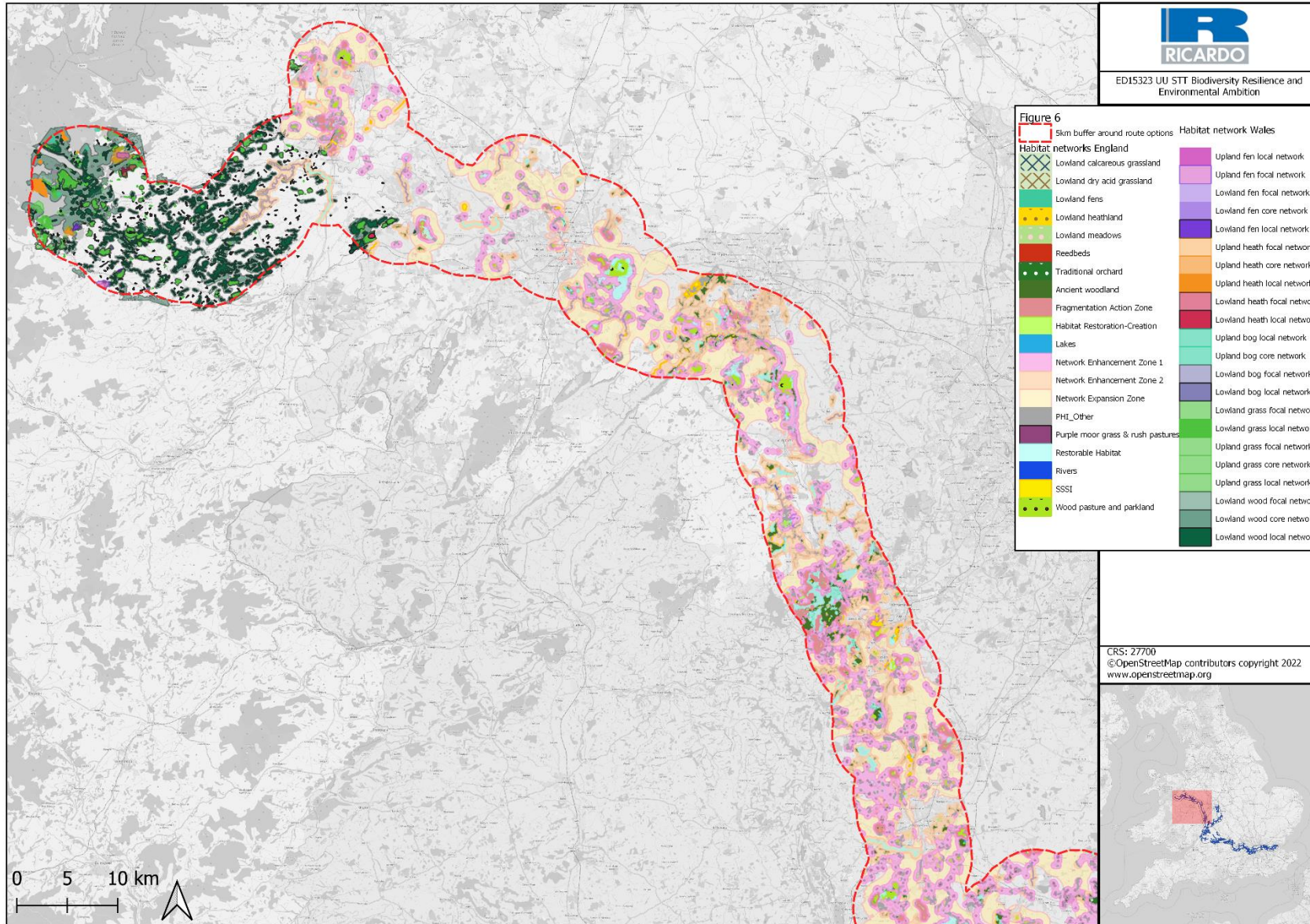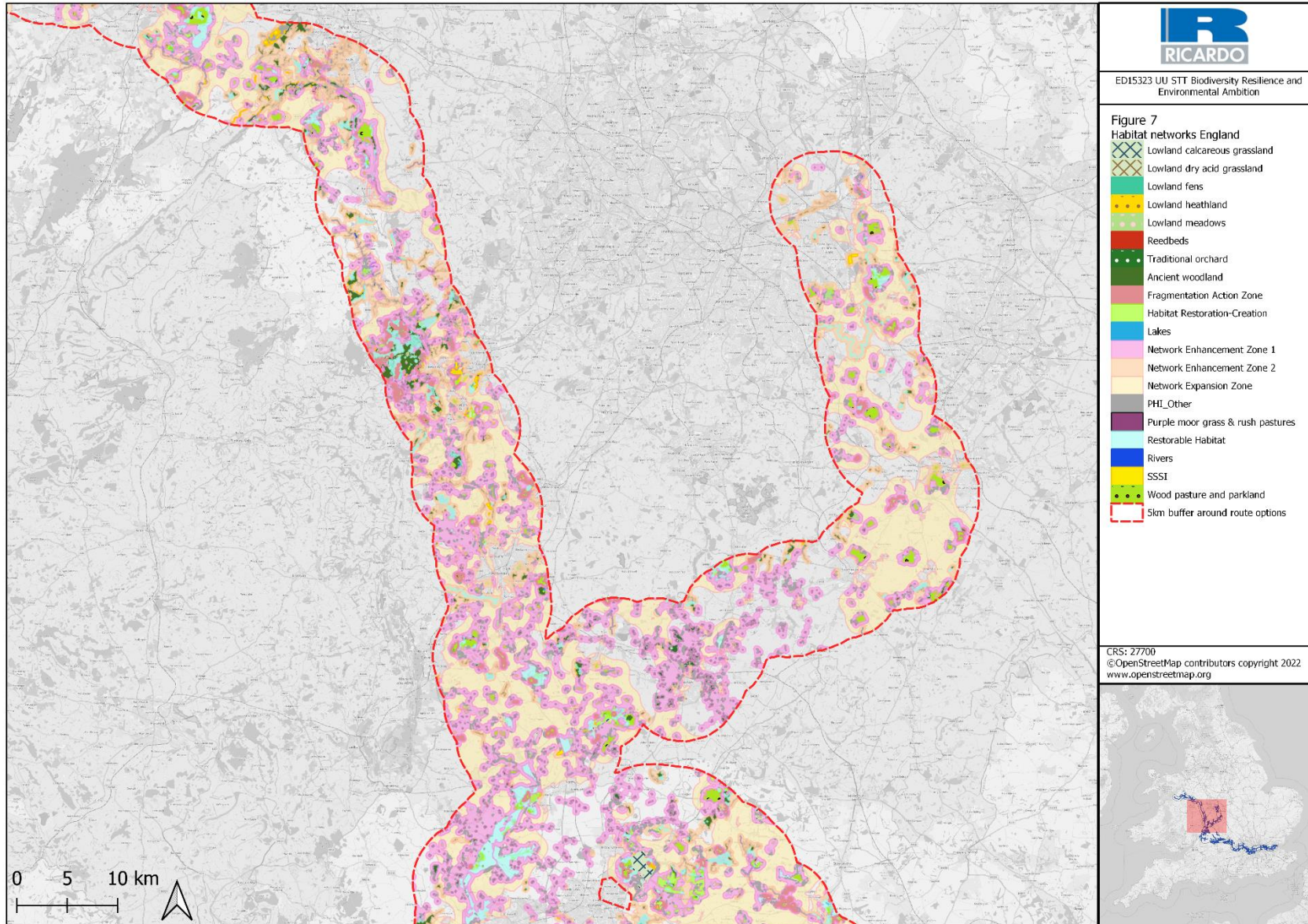Figure 8 STT Opportunity Layers and Habitat Network - Map 1

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Figure 7
Habitat networks England

- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland fens
- Lowland heathland
- Lowland meadows
- Reedbeds
- Traditional orchard
- Ancient woodland
- Fragmentation Action Zone
- Habitat Restoration-Creation
- Lakes
- Network Enhancement Zone 1
- Network Enhancement Zone 2
- Network Expansion Zone
- PHI_Other
- Purple moor grass & rush pastures
- Restorable Habitat
- Rivers
- SSSI
- Wood pasture and parkland
- 5km buffer around route options

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Figure 9 STT Opportunity Layers and Habitat Network - Map 2

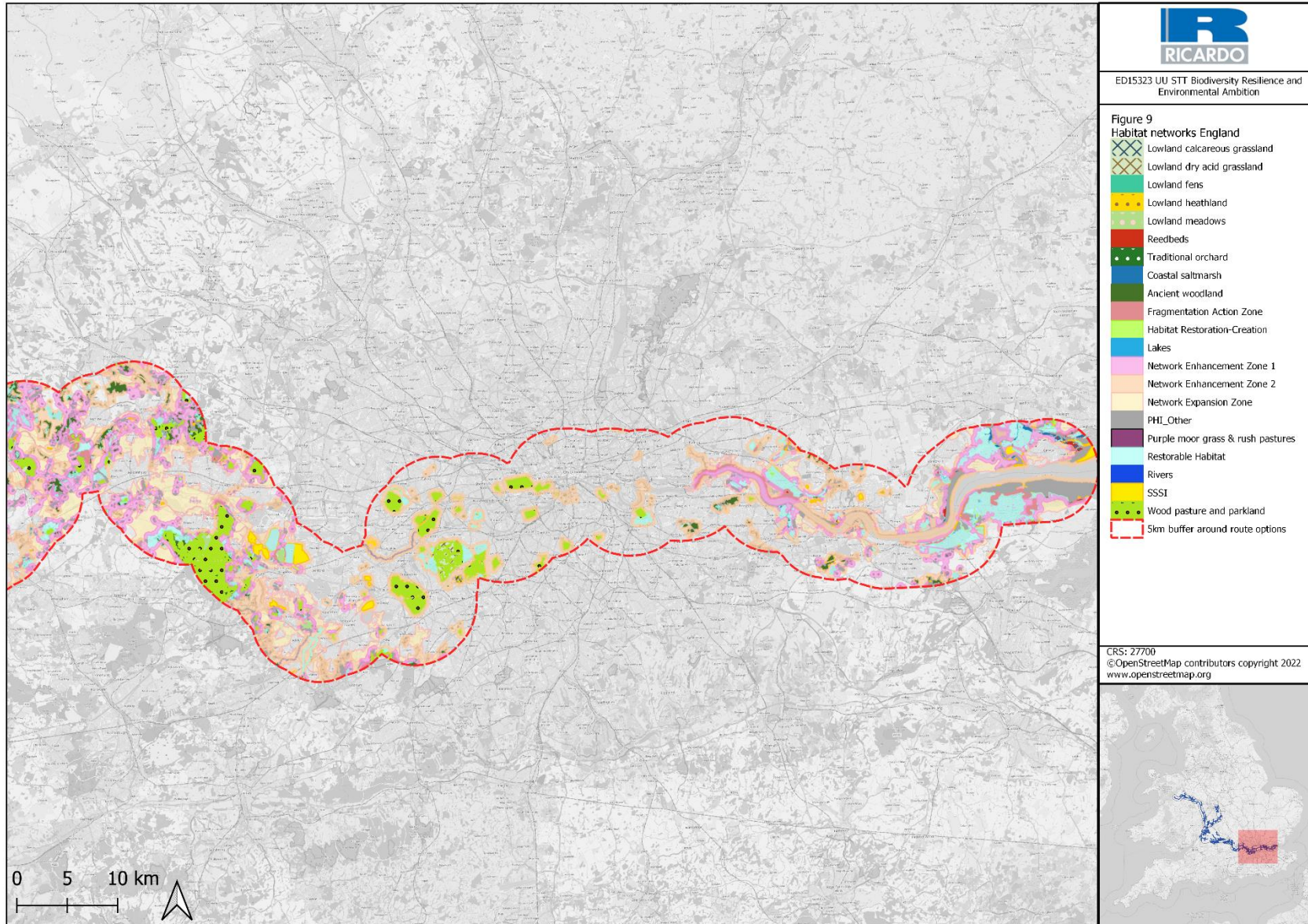Figure 10 STT Opportunity Layers and Habitat Network - Map 3

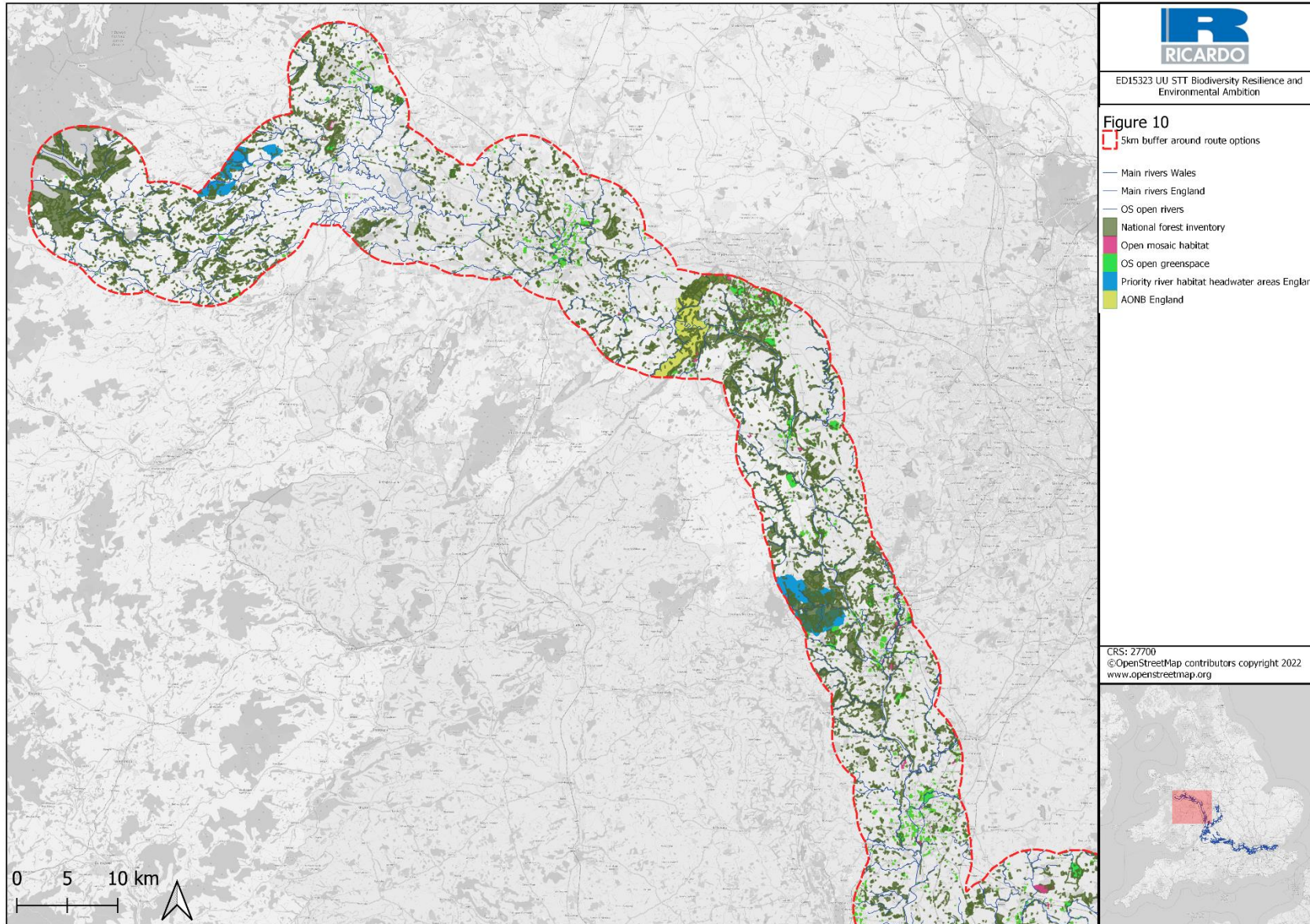Figure 11 STT Opportunity Layers and Habitat Network - Map 4

Figure 12 STT Additional Information from National Scale Datasets - Map 1
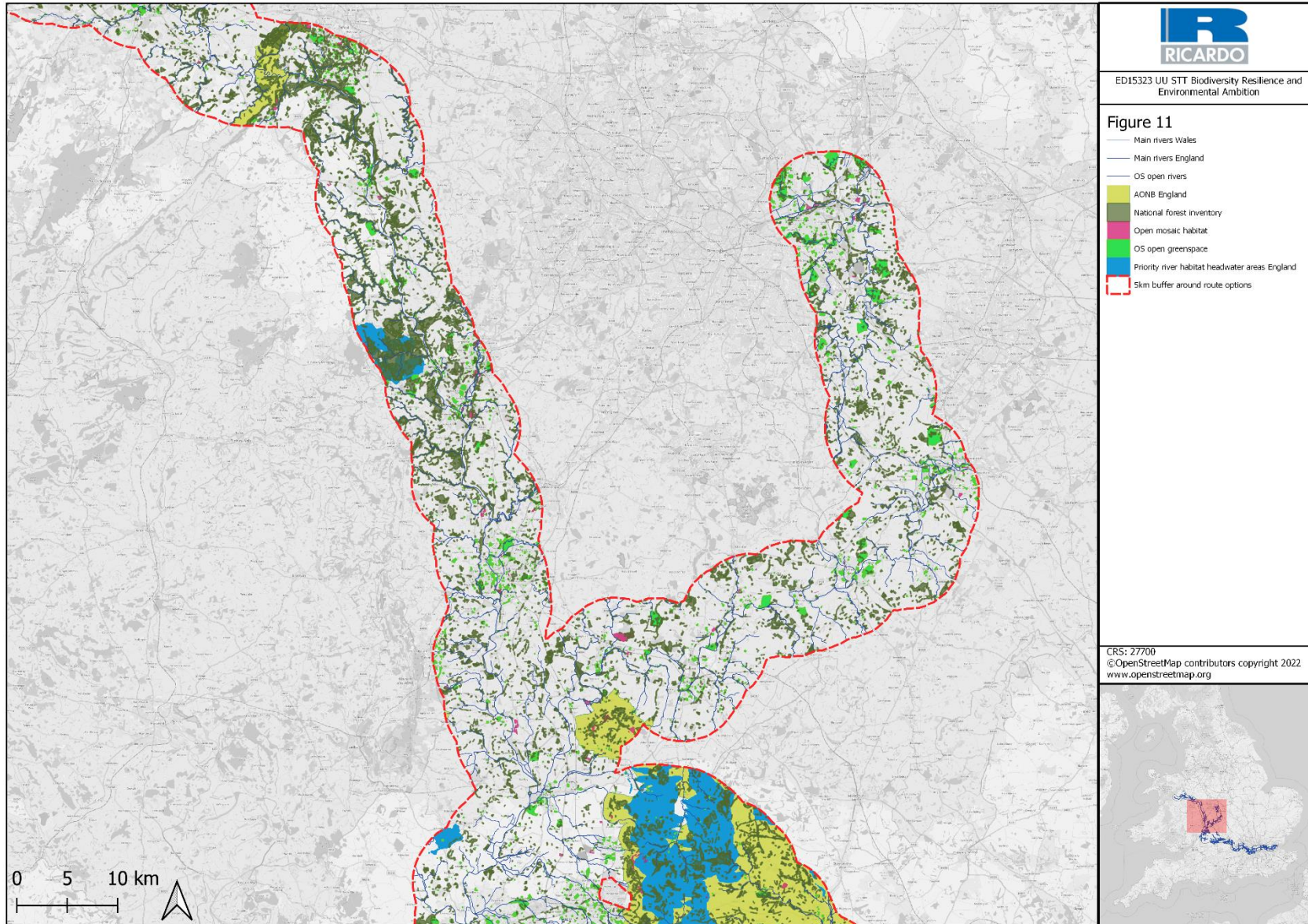
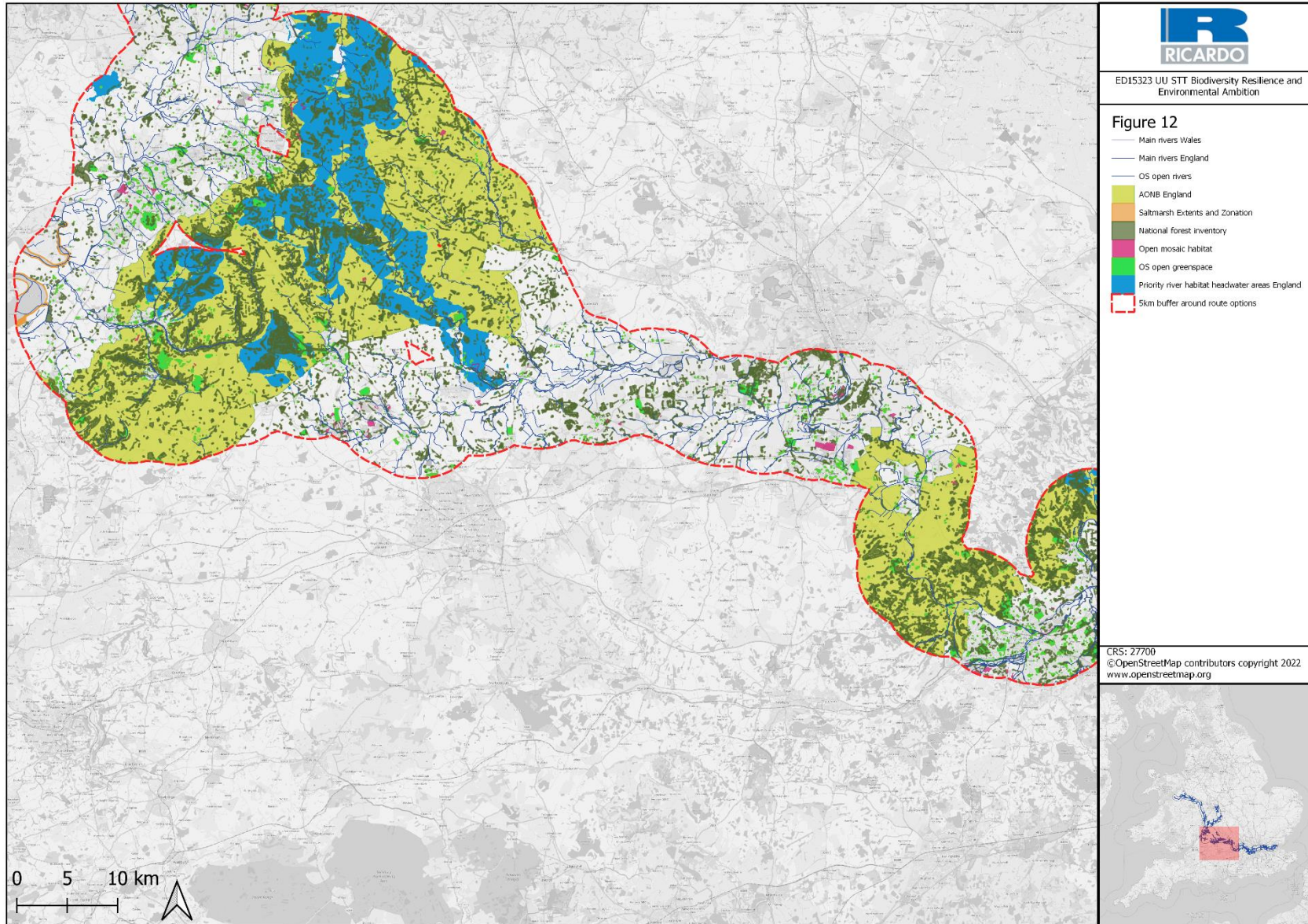Figure 13 STT Additional Information from National Scale Datasets - Map 2

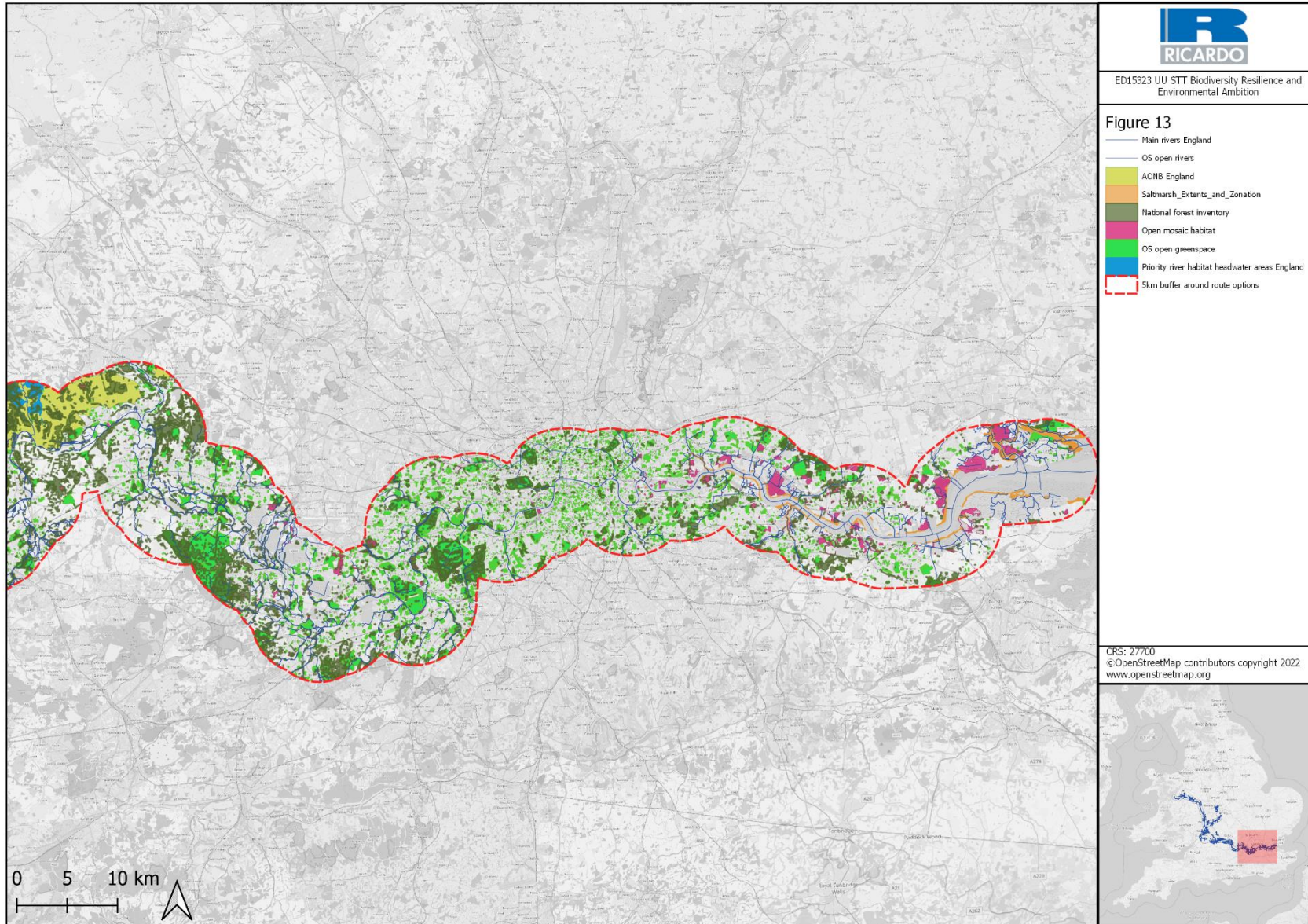Figure 14 STT Additional Information from National Scale Datasets - Map 3

Figure 15 STT Additional Information from National Scale Datasets - Map 4
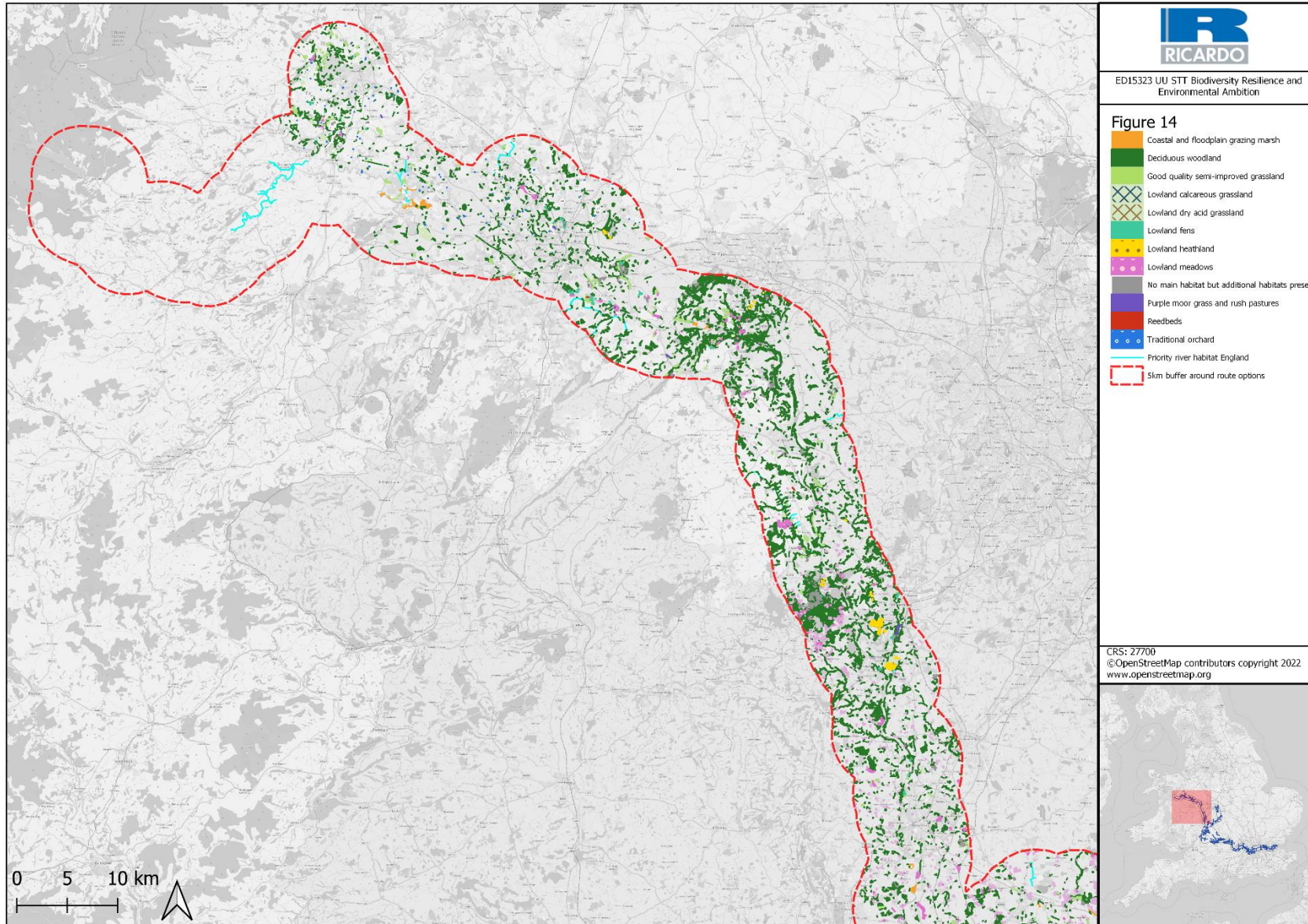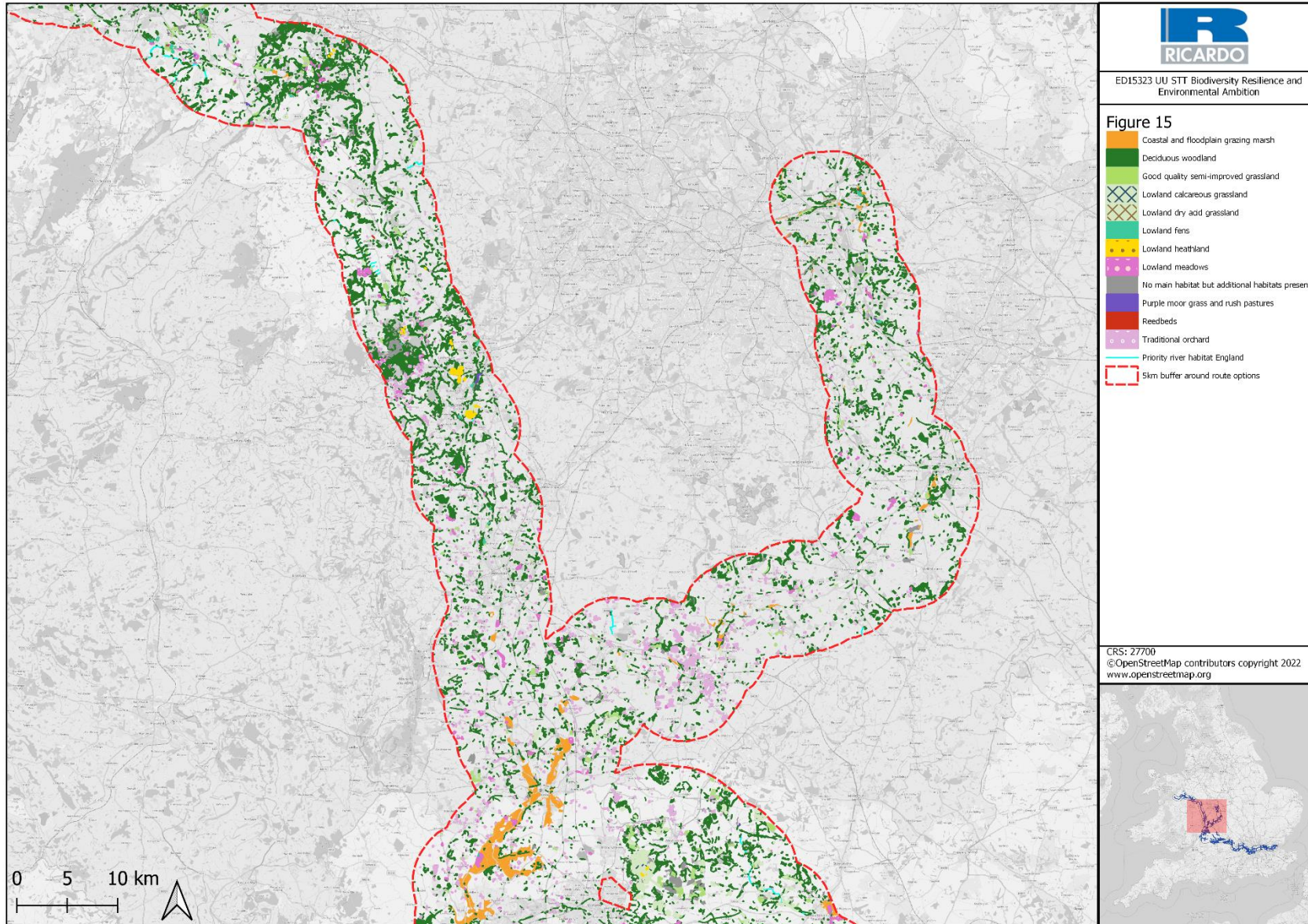
Figure 16 STT Priority Habitat - Map 1
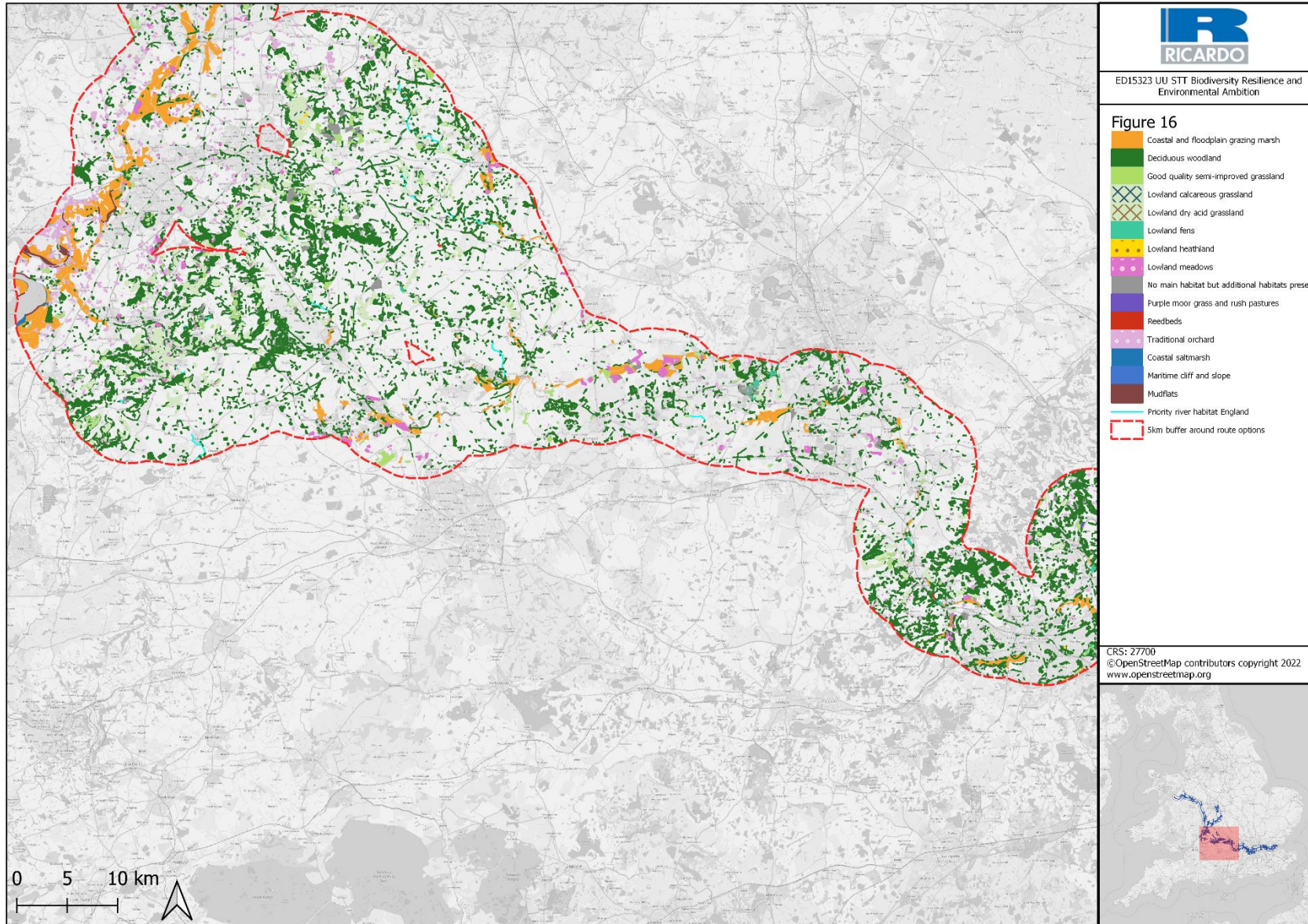
Figure 17 STT Priority Habitat - Map 2

Figure 18 STT Priority Habitat - Map 3
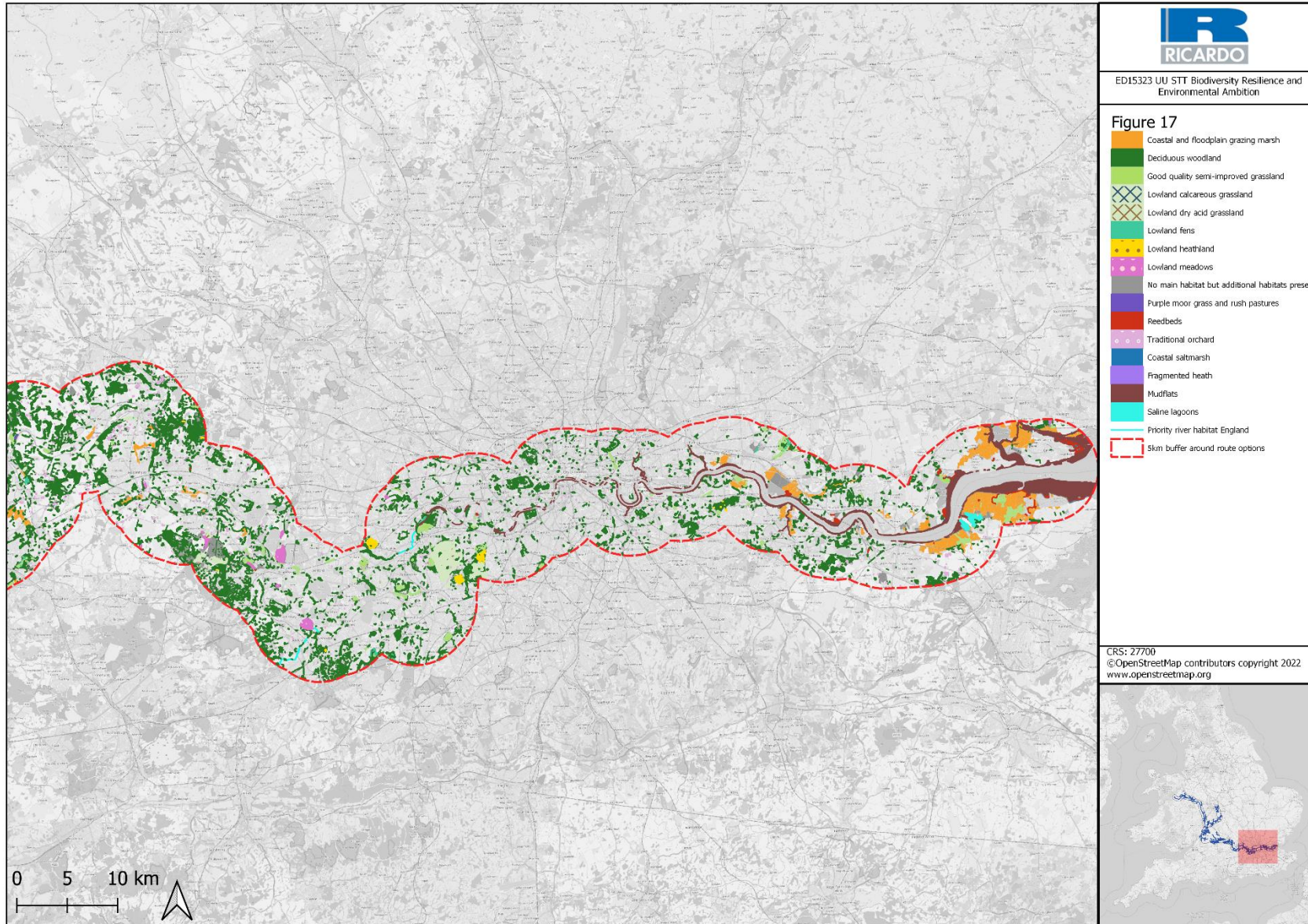
Figure 19 STT Priority Habitat - Map 4

Figure 20 STT Designated Sites - Map 1

Figure 21 STT Designated Sites - Map 2

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Environmental Ambition

Figure 20

- SSSI Impact Risk Zones
- SSSI England
- SAC England
- SAC Wales
- SPA England
- SPA Wales
- RAMSAR England
- RAMSAR Wales
- NNR England
- 5km buffer around route options

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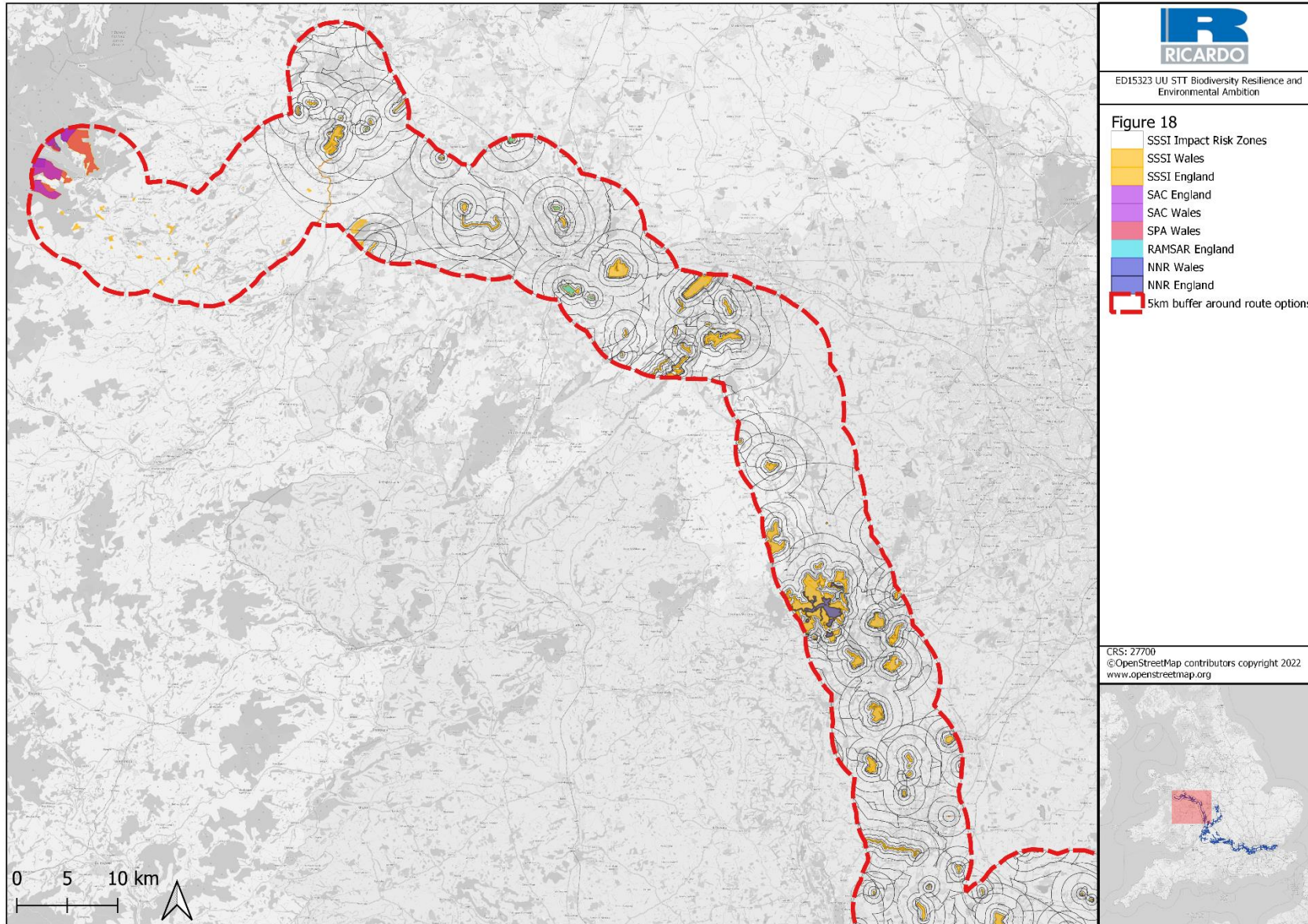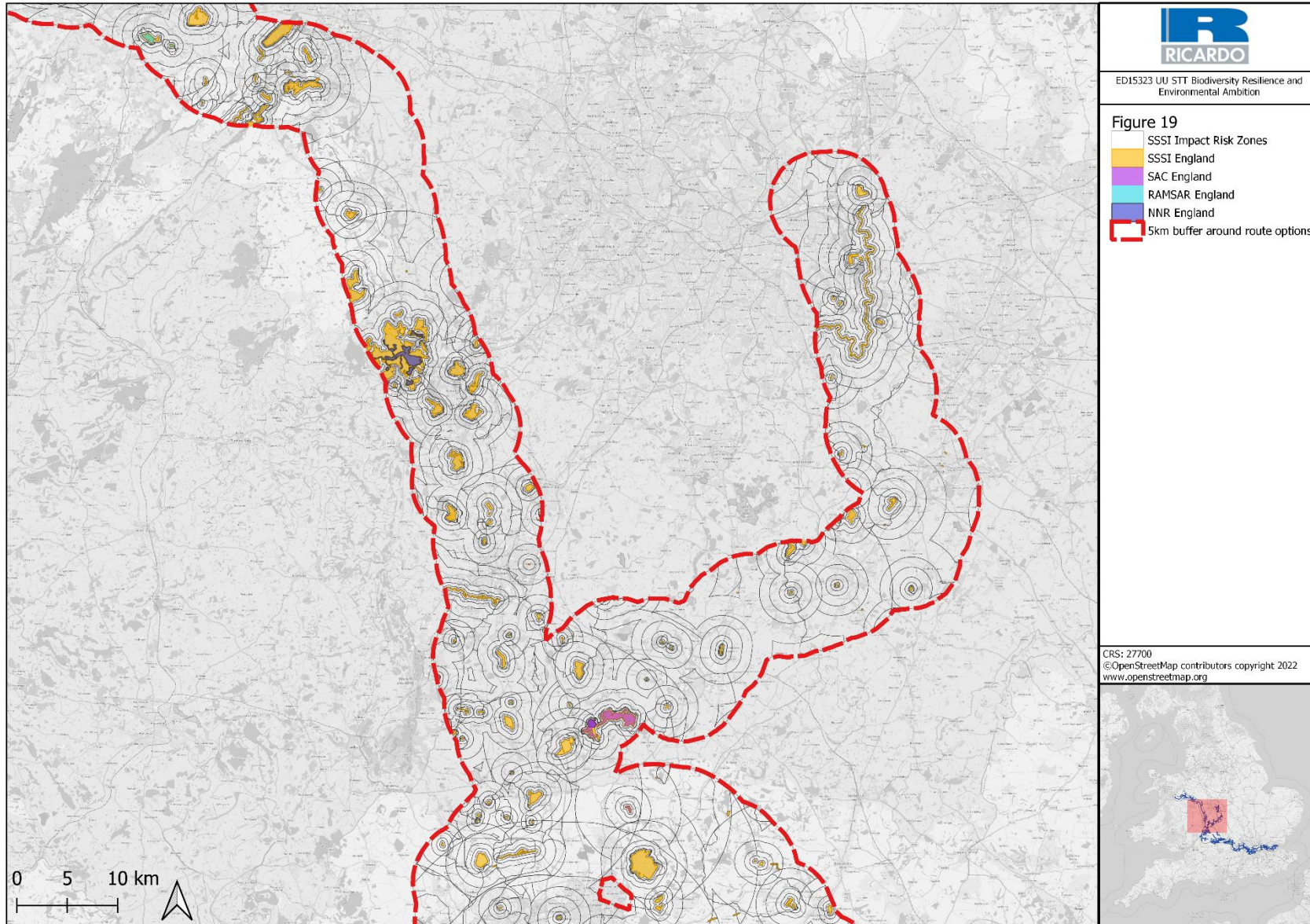www.openstreetmap.org

0   5   10 km

Figure 22 STT Designated Sites - Map 3

Figure 23 STT Designated Sites - Map 4

Figure 24 STT Non-designated Sites - Map 1
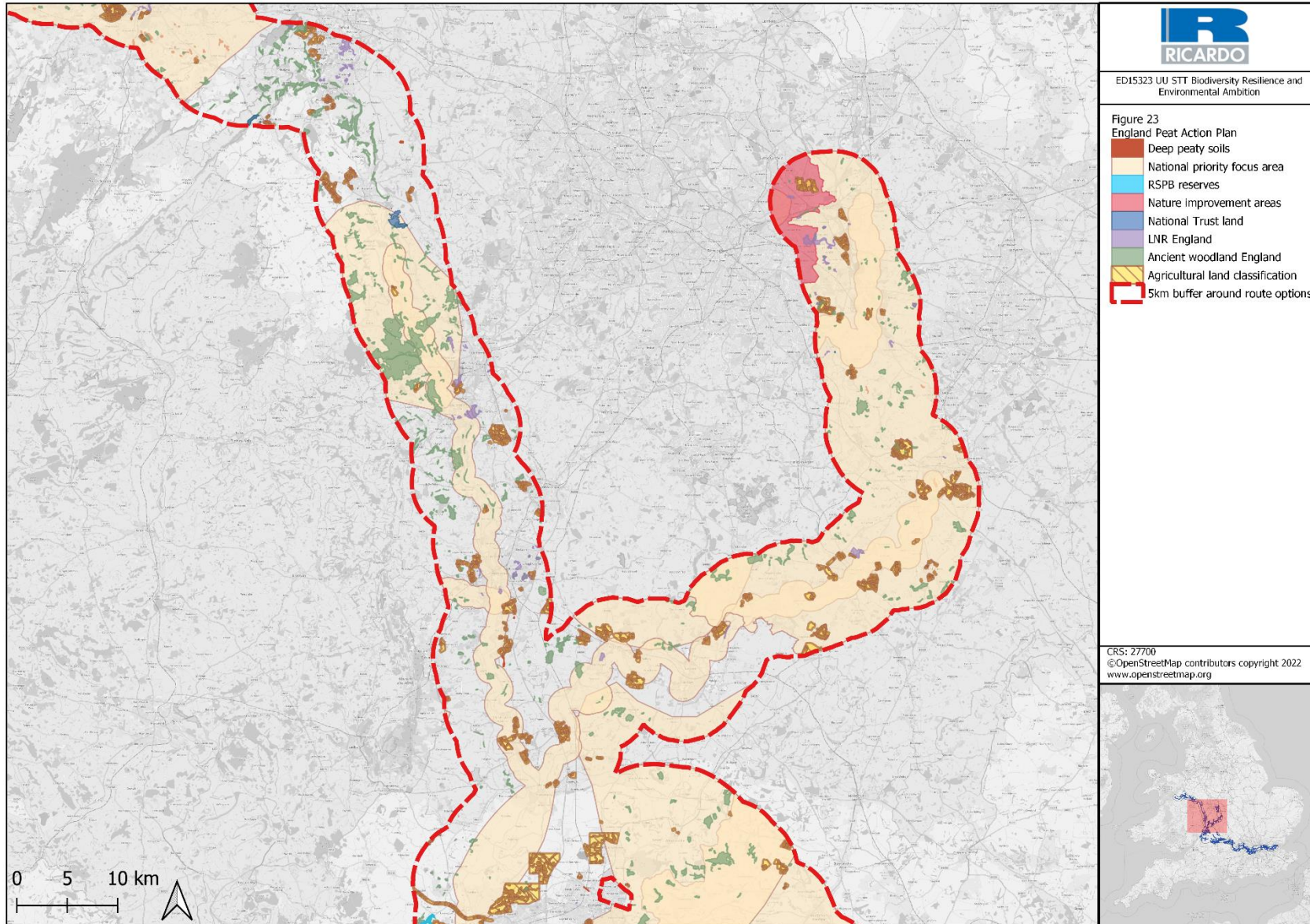
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Figure 23
England Peat Action Plan

- Deep peaty soils
- National priority focus area
- RSPB reserves
- Nature improvement areas
- National Trust land
- LNR England
- Ancient woodland England
- Agricultural land classification
- 5km buffer around route options

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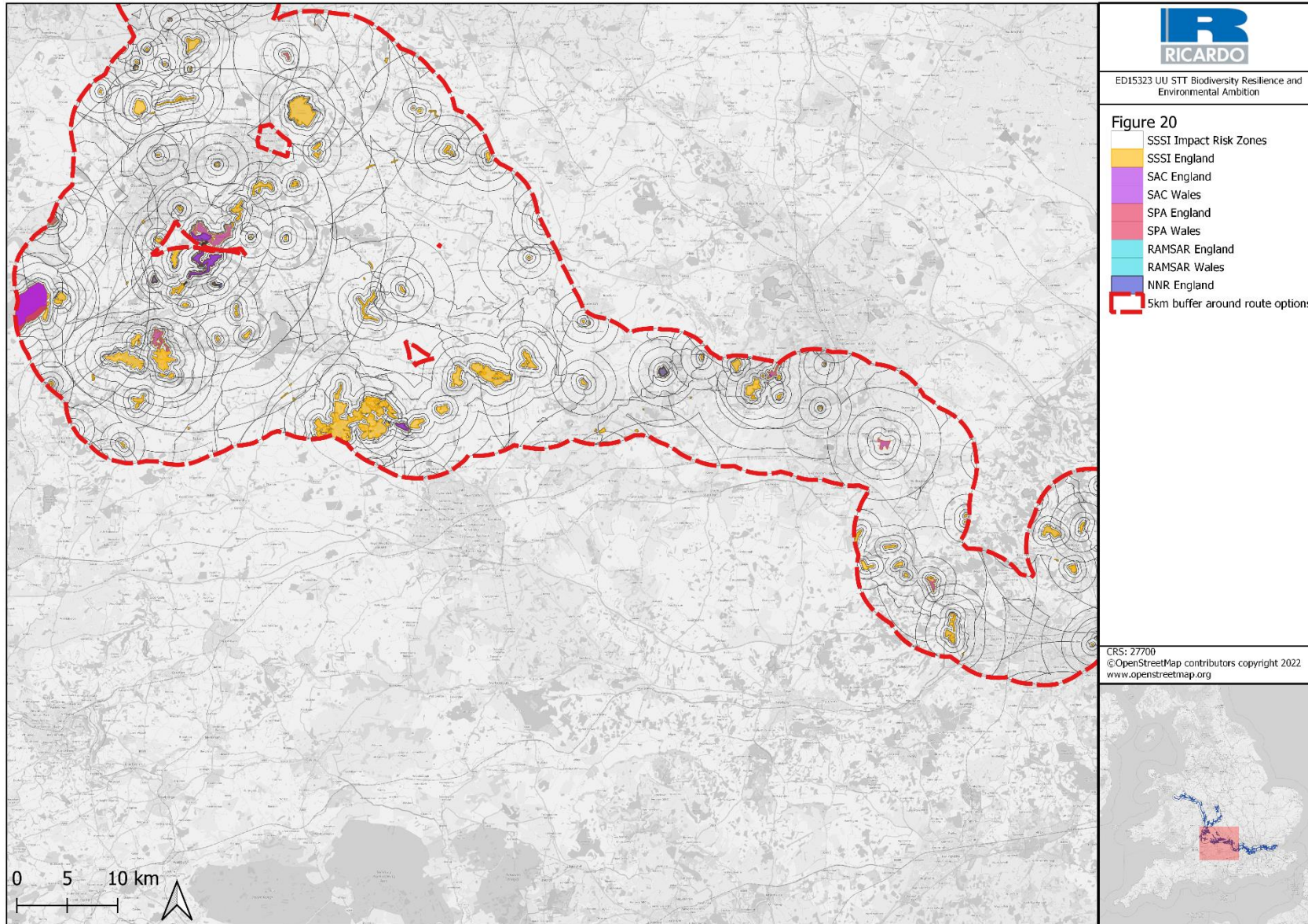www.openstreetmap.org

0   5   10 km
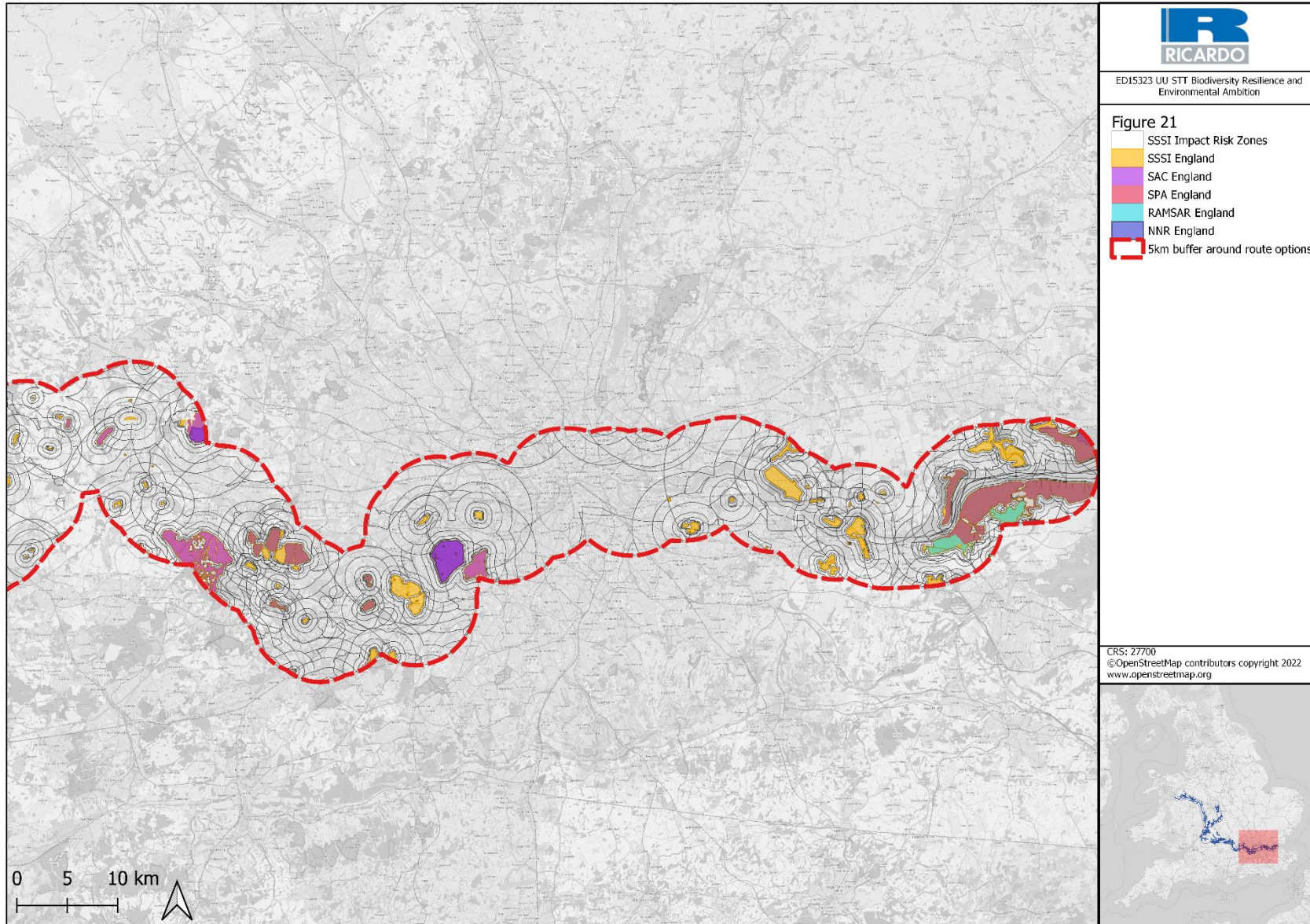
Figure 25 STT Non-designated Sites - Map 2

Figure 26 STT Non-designated Sites - Map 3

Figure 27 STT Non-designated Sites - Map 4

Figure 28 STT WFD and Air Quality data - Map 1

Figure 29 STT WFD and Air Quality data - Map 2

Figure 30 STT WFD and Air Quality data - Map 3

Figure 31 STT WFD and Air Quality data - Map 4

Figure 32 STT Flooding - Map 1

Figure 33 STT Flooding - Map 2

Figure 34 STT Information From Local Authorities Derived From Published Plans Showing Land Use Allocation - Map 1

Figure 35 STT Information From Local Authorities Derived From Published Plans Showing Land Use Allocation - Map 2

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and Natural Capital Report

Figure 34

Tewkesbury layers
Special landscape Tewkesbury
Tewkesbury housing site allocations
Landscape protection Tewkesbury

Cotswold layers
Cotswold strategic development areas 3
Cotswold strategic development 4
Cotswold strategic development 5
Cotswold strategic development 6
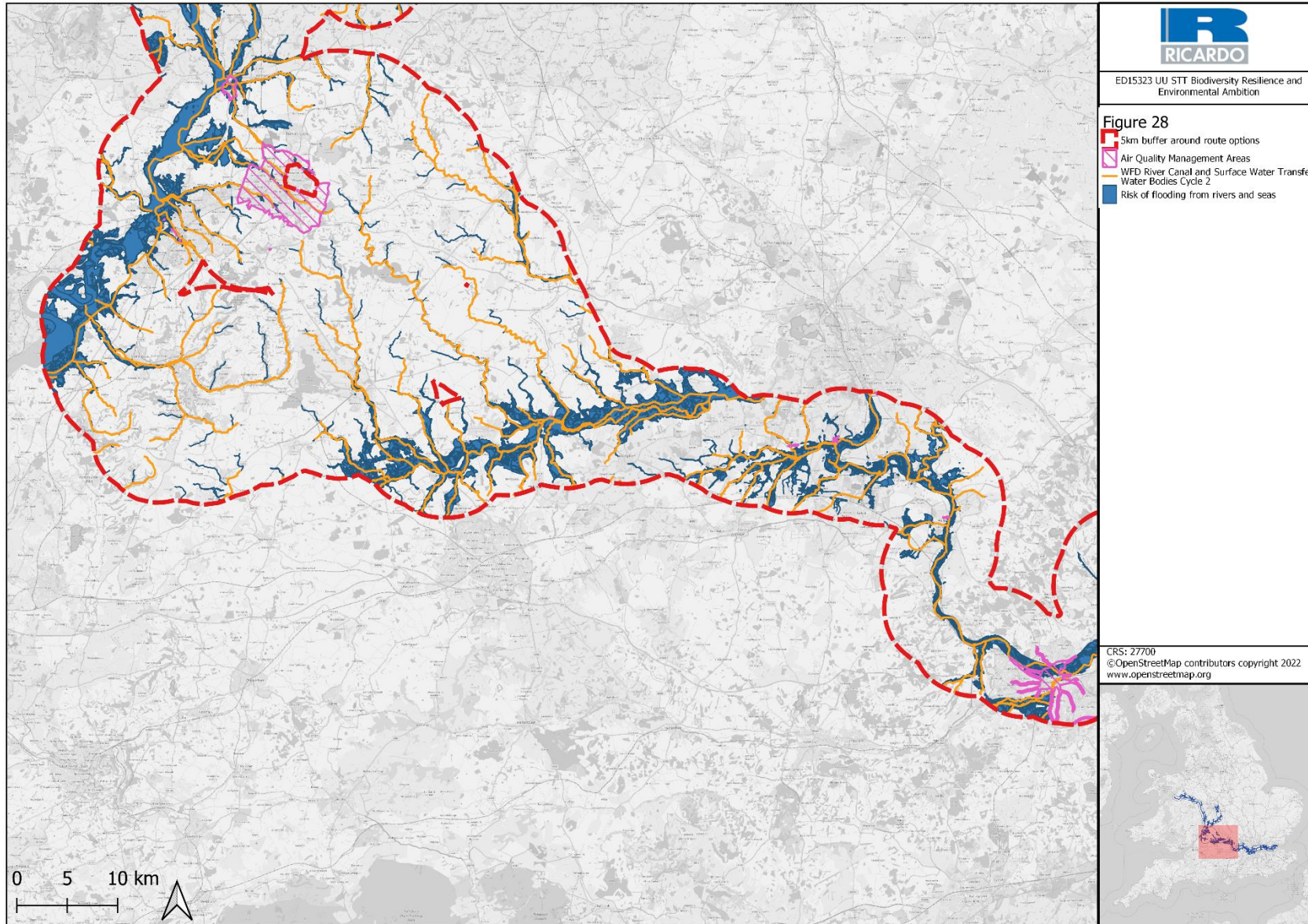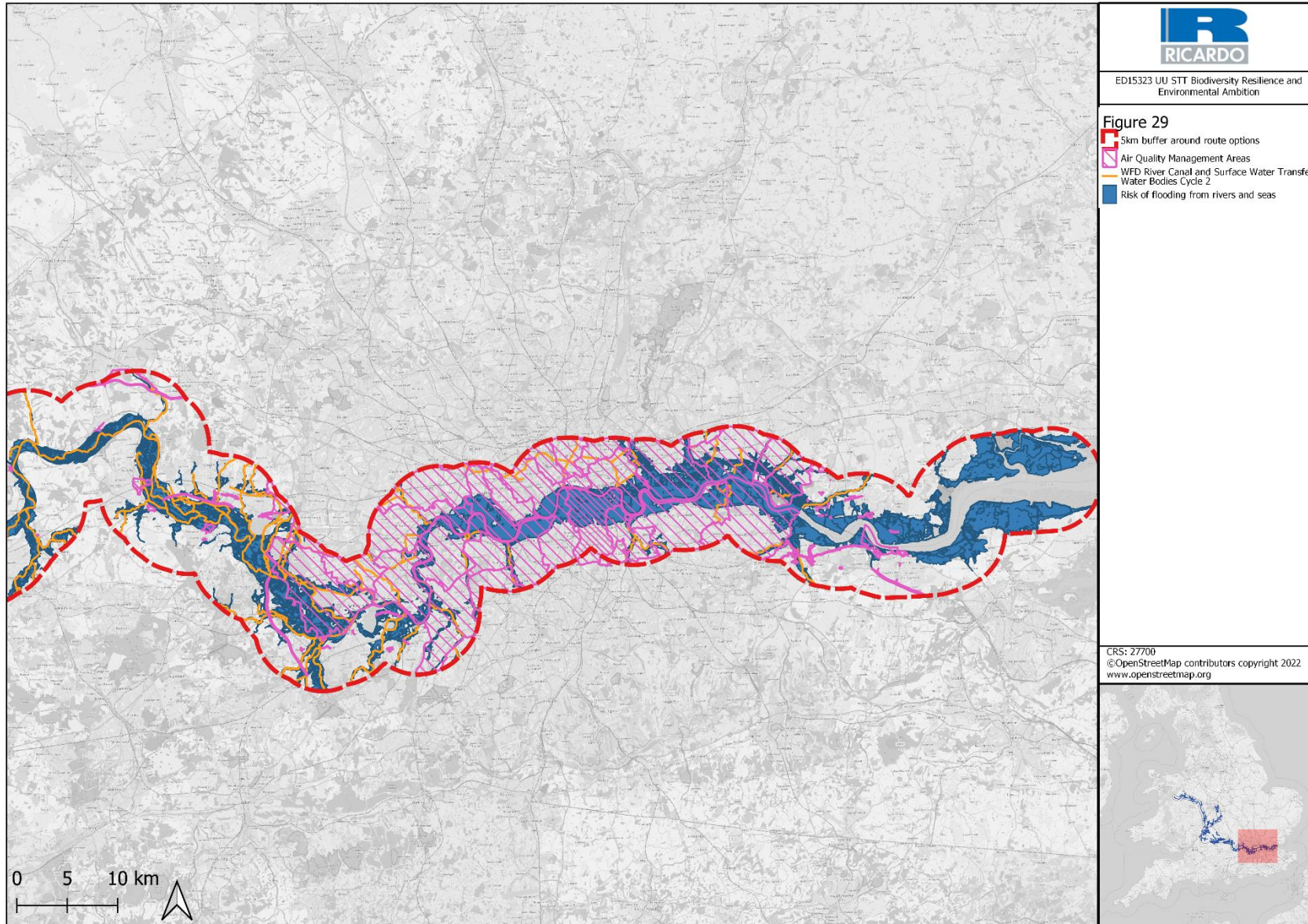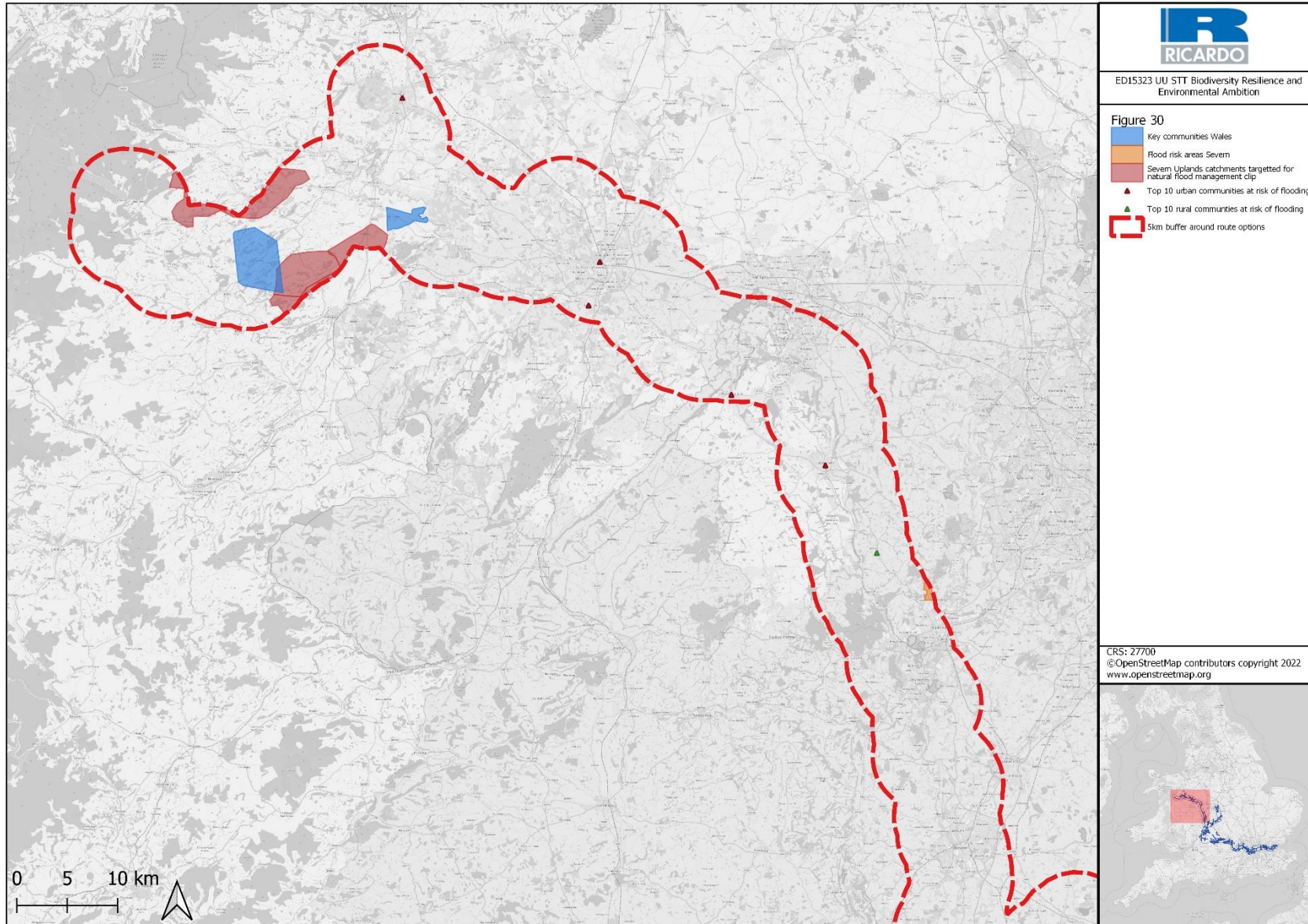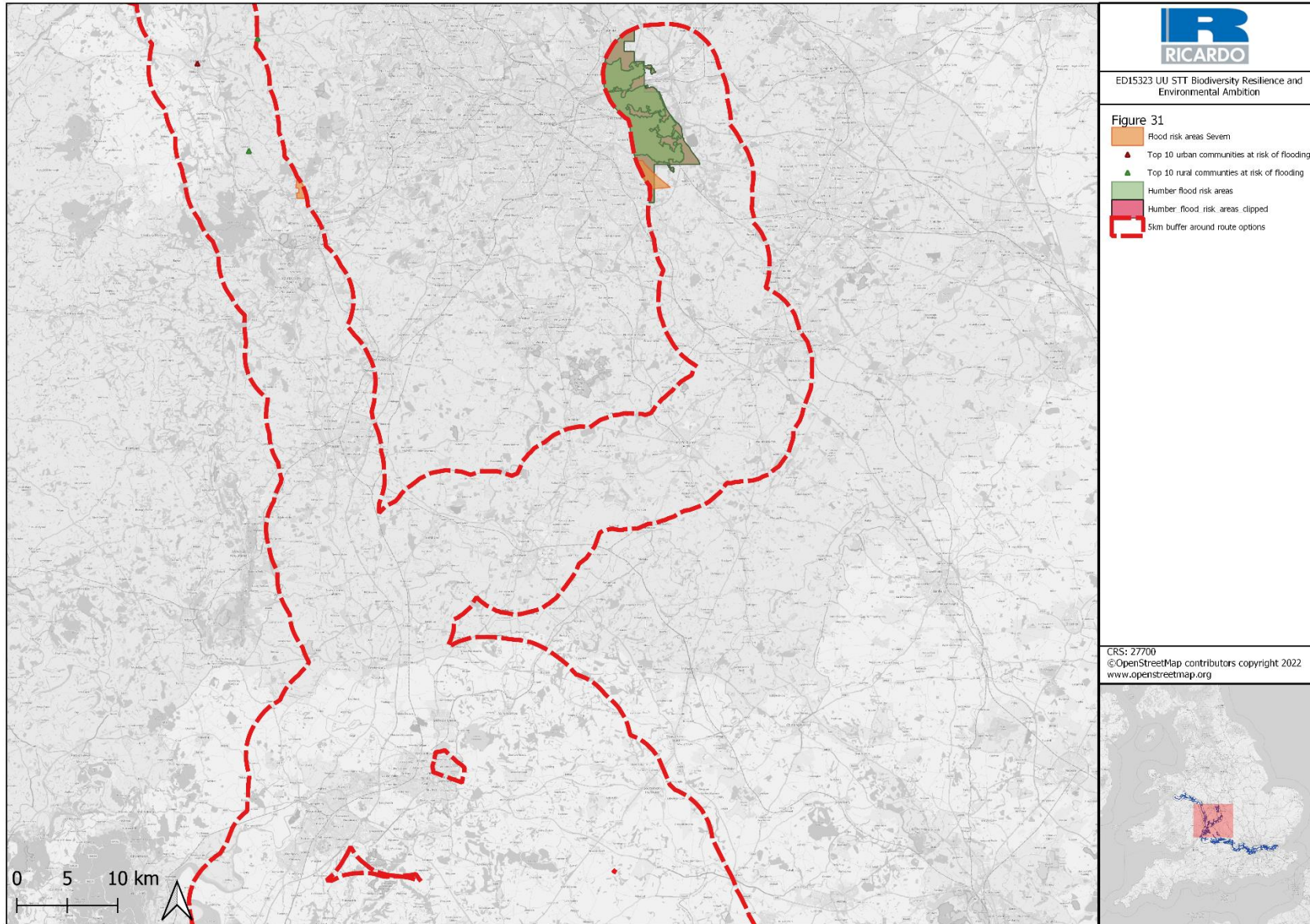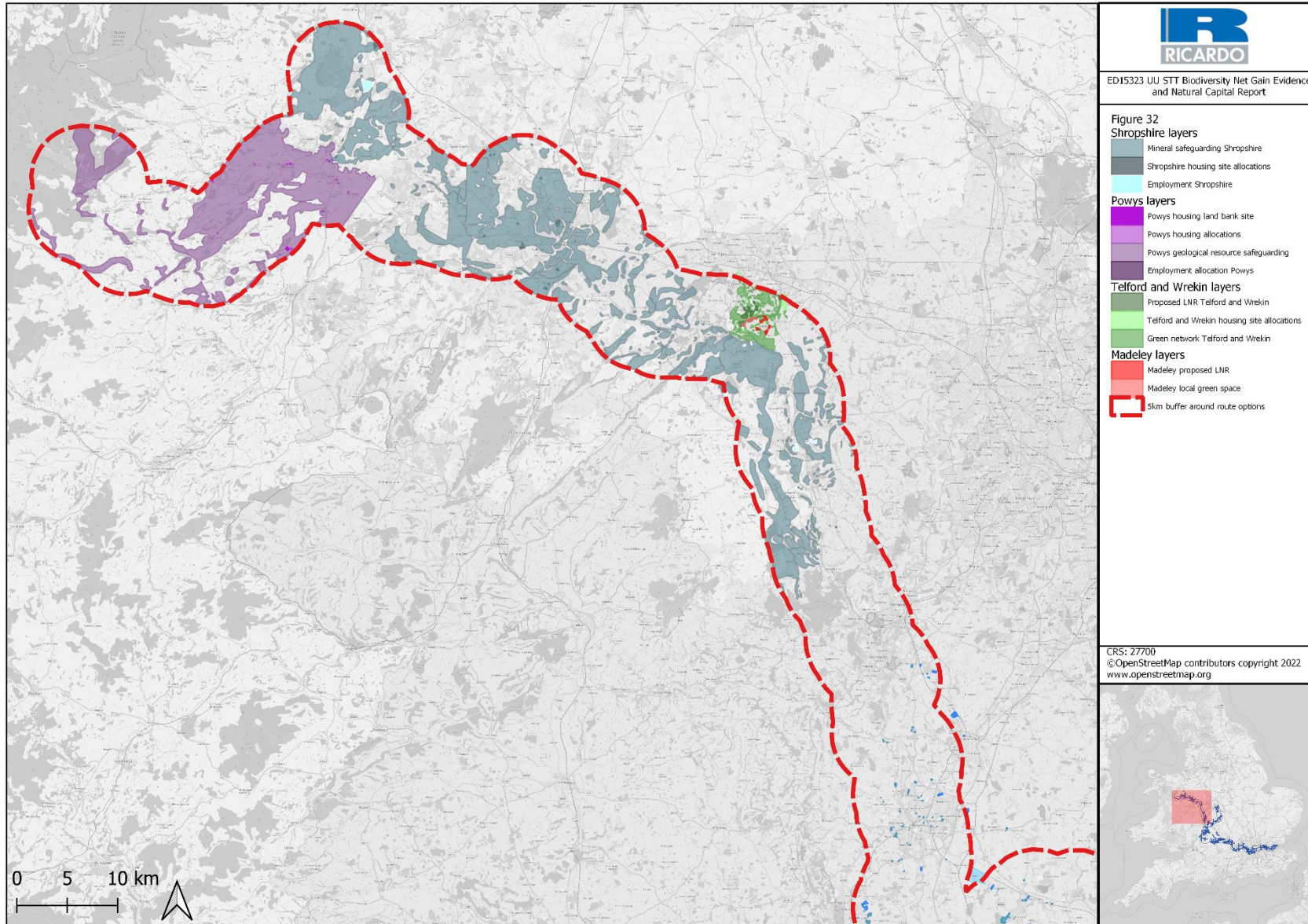Special landscape Costwold
Local GS Cotswold
Employment Cotswold

Gloucester layers
High landscape sensitivity Gloucester
High-med landscape sensitivity Gloucester
Gloucester site allocations
Nature recovery Gloucester
Public open space Gloucester

Vale of Whitehorse layers
Nature and conservation target area Vale of Whitehorse
Vale of Whitehorse housing allocations
Didcot power station Vale of Whitehorse

Stroud layers
Key employment areas Stroud
Stroud strategic site allocations
Safeguard location new railway station Stroud
Estuarine and river floodplain Stroud
Conserving wildlife & natural estuarine habitats Stroud
Canal conservation and restoration Stroud
Swindon site allocations
Churchdown Innsworth strategic site allocations

Down Hatherley Norton Twigworth layers
Down Hatherley Norton Twigworth housing allocation
DHNT public views
DHNT safeguarded area
Highnam residential business developments

Twyning layers
Twyning public views
Twyning important sport recreation amenity
Twyning housing allocation

Winchcombe layers
Winchcombe proposed allotments
Winchcombe local open space
Winchcombe commerical development

Farrinndon layers
Farringdon proposed green space designations
Farringdon existing proposed employment land
Faringdon major development sites
Drayton neighbourhood housing site

Easington layers
Eastington key employment site
5km buffer around route options

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0 5 10 km

Figure 36 STT Information From Local Authorities Derived From Published Plans Showing Land Use Allocation - Map 3

APPENDIX 2 WORKSHOPS
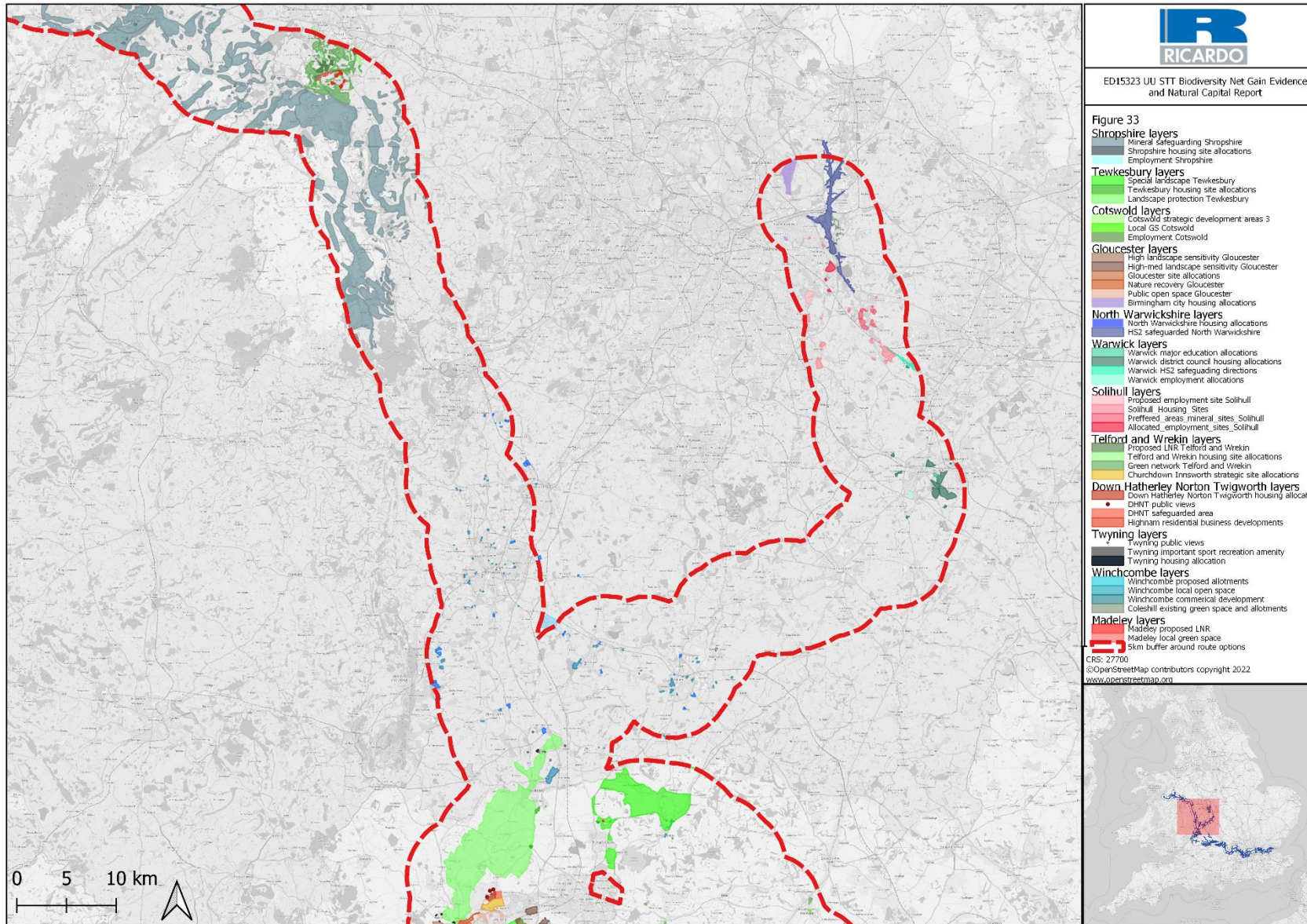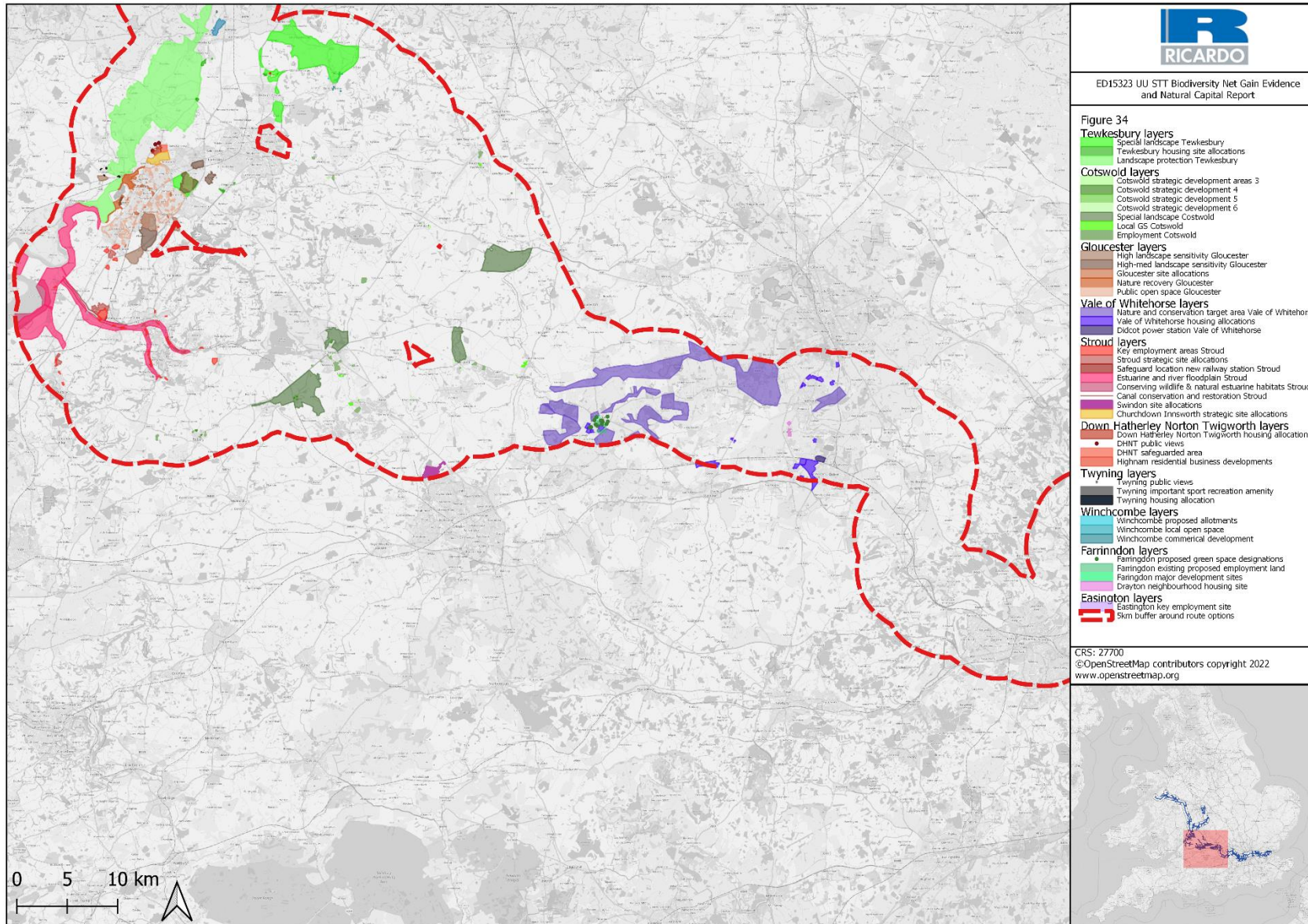
Workshop Summary

Three workshops are planned: two have been held already: 15th December 2021 and 31st January 20022.

The overall aim of these workshops are to present the proposed approach to biodiversity resilience and net gain opportunities for the Gate 2 assessment of the Severn Thames Transfer (STT) strategic resource option, and solicit feedback and information from the workshop participants, the Environmental Regulators. The workshops, along with answers to an issued questionnaire, have been instrumental to gather gathering views, discuss opportunities, and engage with key stakeholders.

In the second workshop, following a plenary presentation on the outcome of the questionnaire from Workshop 1, attendees were divided into three groups to discuss opportunities, issues and ascertain if there were missing data and/or key organisations that should be contacts as part of more future focused stakeholder engagement.

Key outputs for each group session

The key outputs from workshop 2 are summarised below for each group. The recordings of each group discussion can be via the following link: BNG NC SMNR Workshop 2 Recordings. The overall summary of the discussion can be found below.

Group 1: Summary of Discussion

Data
- Wetland's opportunity layer – Environment Agency – may be embedded into Nature Recovery Networks

Opportunities
- Concrete outfalls, sewer overflows - setting back outfalls opening up, underground drainage   - Sustainable urban drainage   - Retrofitted suds   - Trees planted in the Avon catchment   - Increase hydro morphological diversity   - Bed raising   - Land Bank approach – an approach to work with landowners to offset or provide net gain opportunities for developments   - Stroud – have gone down a charitable trust route so that farmers particularly like in the flood plain where there are significant opportunities particularly in seven vale to restore floodplain meadows to species rich grassland   - In Gloucestershire there's significant amount of growth planned   - In channel barriers, riparian buffer strips, floodplain connectivity   - Flourishing flood plains - floodplain meadow partnership in Gloucestershire – Severn Vale   - River that runs out of Stroud is a salmon river and has got huge issues at the minute in terms of flow and abstractions from canal rivers trust   - Floodplain reconnection and linked morphological diversity – e.g., meandering and connection   - Offline refuges where small fish can shelter and spawn in   - Barrier removal   - Eels are critically endangered species and simple things like putting in passage devices on structures really helps   - Blue green infrastructure

Issues
- It's hard to pinpoint opportunities because there are hundreds of opportunities within the catchments and it's hard to be specific and list them.   - Competing with huge infrastructure projects that are trying to do the same thing. For example, between Coventry and Birmingham there are HS2 developments

Contacts
Strategic plan team in Stroud – Land Bank approach

•	Floodplain meadows partnership which is national and also covers the Thames

General comments
• Talking to partners and catchment coordinators is really important to define what the opportunities are in the areas.

Group 2: Summary of Discussion

Data
• Fish barrier data

Opportunities
• River Corridor linking and focus back on habitat enhancement around the river and tributaries and wider benefits of that Note: Opportunities in the River Severn. • Freshwater pearl mussel opportunities plus salmon • Blanket bog project relates to designated and European sites. RSPB at Vyrnwy – need to speak to RSPB • Nothing specific on Shrewsbury but looking at ecology in the rivers and wants the flows to improve for migrating fish. All the way round the Severn Vyrnwy confluence, with potential for wetlands • R. Avon – Stour projects – note multiple benefits.   • Woodland loss – west midlands – there's trees planting to offset carbon, could link together (FCRM programme)

Key Issues
• Need information to go through as a team. • Time scales we are working to and how does this work with what is going on at the moment on the ground? E.g., NTP 6 years and this programme maybe 2040

Contacts
• Contact the environment coordinator team, can be landscape scale and if we need bottom up it's the farmer facilitation groups. R. Avon – Stour projects • Blue zone there are big partners at catchment scale – River Severn Partnerships and the Severn River Trust. • Need Information to go through as a team to discuss benefits in the context of WFD failure and catchment wide opportunities. • CaBA, Rivers and Wildlife trust and EA have projects that overlap and contacts for whom leads those externally.

General comments
• Looking for a FWAG outcome for improvement from BNG but so far is seems detrimental rather than improvement • There may be u/s opportunities (outside the 5km buffer that what benefits d/s within the 5km buffer. The initial line, they had a wider line of a % cover to consider more catchment scale. • Break up what's lost into smaller areas to be able to get in contact with the right people, as it's too broad to find out where to start.

Group 3: Summary of Discussion

Data
• Ensure that Environment Wales Act section 7 species list consulted • Agreed that WFD layers and habitat layers are critical to underpinning any assessment
• Ideally need the local records data to understand the detail – recognised there is a cost attached to this and good to have for the detail. • Worcestershire County Council just released habitat inventory. Looks at habitats, has zones of where you could add more of the same habitat and link zones up. Could look at where the links could be. • Oxfordshire – data that links conservation target areas and have data that links high quality habitat areas with poorer landscape between to link habitats related to opportunity areas.

Opportunities

- Grant based schemes have already been identified as a good way to deliver habitats. This is an opportunity to consider in the future to and identify areas where local communities are keen to see habitat and associated recreational benefits.
- Going forward re information – Worcestershire Council – are developing long term detail monitoring of sites.
- Looking at areas that provide interconnectivity could be a good way to go forward in thinking strategically.

Key Issues

- Balance to be had between data that is available now and how to interpretate this for future analysis for benefits and opportunities
- There is a lot going on at the moment – not least the local natural recovery area assessment and the local natural strategies in England – will help with spatial mapping but not yet available – will need to take account of these at Gate 3.
- Terminology and the use of biodiversity opportunity areas (BOAs) – need to be careful as same terminology used in planning circles and landscape opportunities.
- Timescales, water, and environment projects are annual. Some on 6-year scale but this programme of work longer – need to consider how to join up.
- How will Environmental Land Management Schemes (ELMs) play a part in the opportunity areas? Currently this is an unknown and yet to see how this will link to opportunity areas.
- Funding issues related to timescales – need to streamline funding timelines as most environmental programmes are short term projects dependants on short term funding which is not commensurate with longer term planning (e.g., CaBA partnerships are on a year-by-year basis).
- There is a lot of work that is going on in terms of mapping across the whole area – this is likely to be for wider over benefits but need to ensure that all this work is joined up.
- We need to be mindful that neg gain delivery in the future may be more expensive to deliver because of land take. Those with land are aware of the financial opportunities so land values for net gain may inflate.

Contacts

- Need to contact the Upper Thames and the Windrush Partnerships

General comments

- There is a lot going on and, in a few years, likely to have spatial priority mapping through the nature recovery work. There are estimates that the around 30% of the LNRs areas should be identified for nature recovery. However, this information is not currently available. Would need to feed in at Gate 3 and beyond.