

Appendix E - LNRS Development Process

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1. Statutory Guidance and Introduction

Local Nature Recovery Strategies (LNRS) are a system of spatial strategies for nature and environmental improvement required by law under the Act. Under the statutory guidance¹, each strategy must:

- agree priorities for nature's recovery
- map the most valuable existing areas for nature
- map specific proposals for creating or improving habitat for nature and wider environmental goals

By law, each local nature recovery strategy must include:

- a Statement of Biodiversity Priorities
- a Local Habitat Map

Under the Act, the written Statement of Biodiversity Priorities must include:

- a description of the strategy area and its biodiversity
- a description of the opportunities for recovering or enhancing biodiversity in the strategy area
- the priorities for recovering or enhancing biodiversity (taking into account the contribution that this can also make to other environmental benefits)
- proposals as to potential measures relating to those priorities

The Local Habitat Map must identify:

- national conservation sites in the strategy area
- local nature reserves in the strategy area
- other areas in the strategy area which in the opinion of the responsible authority:
 - are, or could become, of particular importance for biodiversity, or
 - are areas where the recovery or enhancement of biodiversity could make a particular contribution to other environmental benefits

The strategy should be prepared so that the Statement of Biodiversity Priorities and Local Habitat Map work closely together. In preparing the LNRS, responsible authorities should follow the order of steps shown in Figure 1.

¹ Department for Environment Food and Rural Affairs (2023). Local nature recovery strategy statutory guidance: What a local nature recovery strategy should contain. Available at: <https://www.gov.uk/government/publications/local-nature-recovery-strategy-what-to-include>

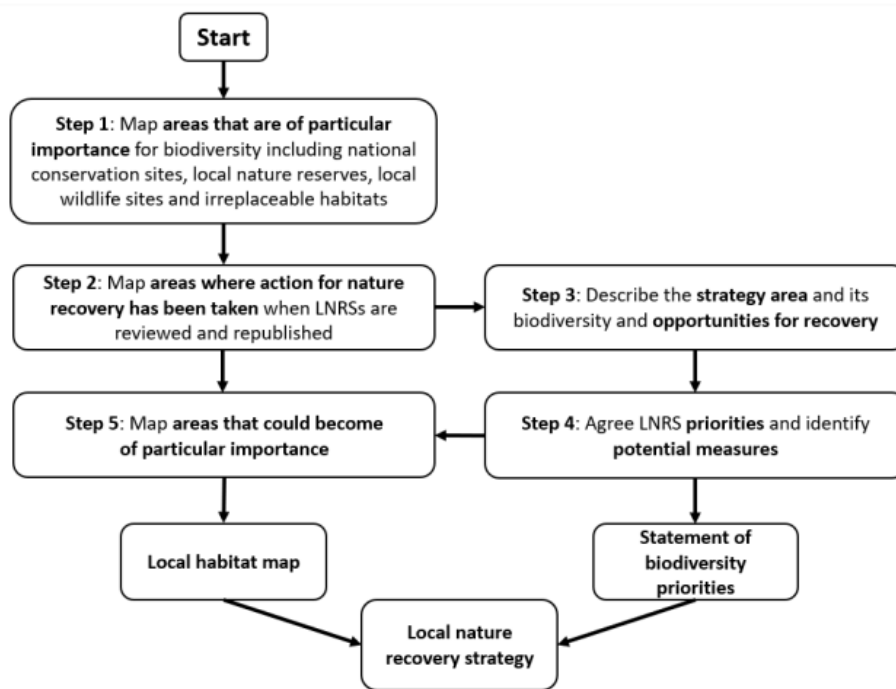


Figure 1: LNRS development process as provided in the DEFRA Statutory Guidance

2. Project Team and Governance

In order to collaboratively develop the LNRS in a way that made the best use of people’s expertise, a number of working groups were established in line with the below governance structure. The project governance structure is shown in Figure 2.

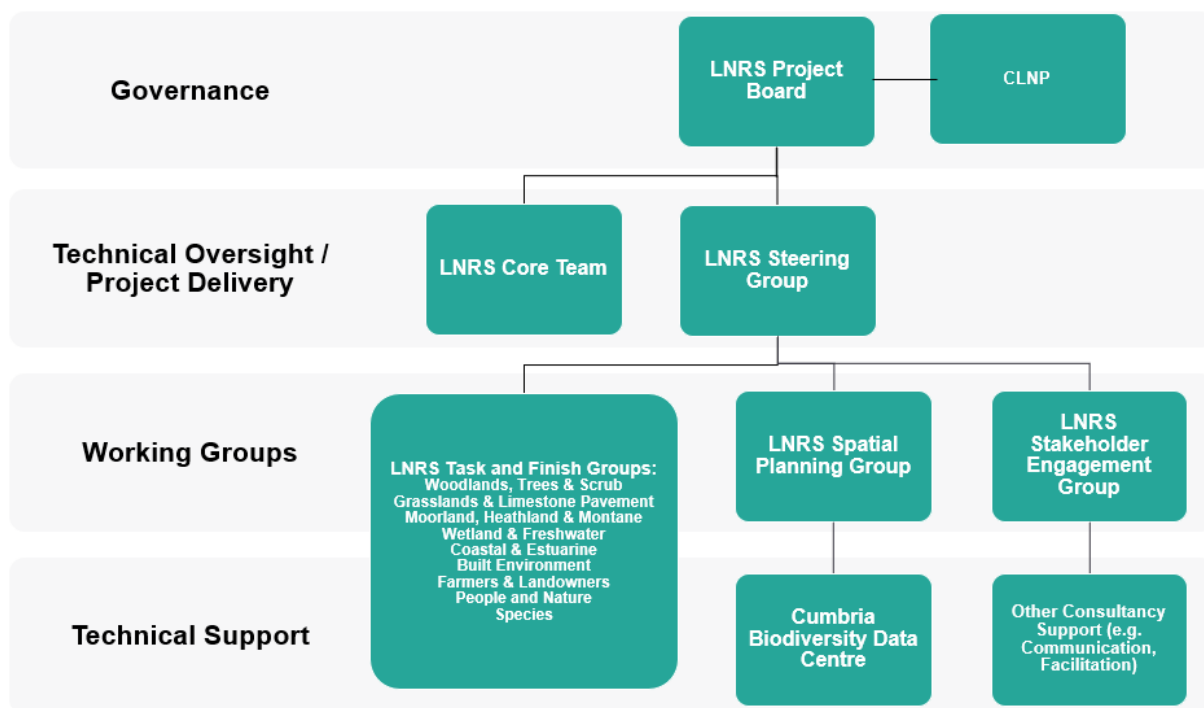


Figure 2: Cumbria LNRS Governance Structure

The following sections outline the methods used by the relevant Task and Finish Groups and associated technical experts when contributing towards the development of the LNRS. The approach was designed to make best use of existing plans and strategies, as well as local knowledge and data, and to provide stakeholders with the assurance that any previous work on nature recovery would be used in the development of the LNRS.

3. Engagement

Under sections 12 to 15 of the ‘Local Nature Recovery Strategy Statutory Guidance’ it was crucial that we worked with partners to both prepare the strategy in the initial stages, but also to review and prepare for publication.

The stakeholder engagement and communications plan outlined the process for establishing a collaborative approach to engage with stakeholders during the development of the LNRS. The plan outlined the identification of key stakeholders and their respective interests, current work, future opportunities and concerns, as well as highlighting how they would be engaged throughout the process. The aim was to ensure that anyone with any level of understanding in nature recovery could get involved and have their say, from statutory bodies and non-governmental organisations, to community groups and individuals.

The core team further established a ‘Stakeholder Engagement Group’ where members with expertise in communications and engagement with a variety of stakeholders were invited to help guide the engagement activities and support the development of the LNRS.

To support the ambition that the Cumbria LNRS is locally-led and evidence based, a range of engagement activities were scheduled throughout the development process to encourage maximum participation. These included workshops, webinars, website updates, newsletters, surveys and online drop-in sessions, and the team engaged with nearly 700 individuals throughout the development of the LNRS.

4. Evidence Review

Each Task and Finish group was granted access to a Microsoft SharePoint folder for their area of interest. An excel spreadsheet was created for each LNRS theme and saved within the relevant SharePoint Folder for everyone to access.

The spreadsheet contained 3 tabs which included:

- **evidence list:** a list of all documents in the main evidence base spreadsheet that are considered relevant to this theme

- **pressures and opportunities:** to record key facts and figures that could be used to inform this section of the LNRS
- **priorities and measures:** to record the priorities and measures from the evidence base that are relevant to the LNRS

An evidence base was created and stored internally by Westmorland and Furness Council. This listed all strategies, plans and guidance which were either used during the Cumbria pilot or had been shared with the LNRS team since. The documents within the evidence base that were considered relevant to each specific Task and Finish Group were copied to the 'Evidence list' tab in the relevant spreadsheet.

In order to ensure that we had as much relevant information as possible to inform the LNRS, members of the task and finish groups were asked to review the list of documents available for their area of expertise. They were then asked to add any key documents that were missing to the spreadsheet.

The members of each task and finish group were asked to allocate their name to the documents that were most relevant to them and extract key information that could be relevant for the development of the LNRS.

5. Describe the strategy area, its biodiversity, and opportunities for recovery

An early review of the Cumbria Pilot LNRS identified that a lot of work had already been done on describing the strategy area, its biodiversity, pressures and threats, and opportunities for nature recovery. This was largely reused for the current LNRS, following a review and minor updates where needed.

If during the document review process stakeholders came across any information that would be useful when describing the pressures and opportunities for nature recovery in Cumbria, including any information on wider benefits that come from nature recovery, they copied and pasted this information into the 'Pressures and Opportunities' tab of the spreadsheet.

Both the pilot text and any additional information provided in the spreadsheet were referred to when drafting the Statement of Biodiversity Priorities text.

The draft chapters were shared with the relevant technical groups for their input before being presented to the Steering Group for review.

6. Agree Priorities

Non-statutory advice from Natural England (NE)² set out an approach to help responsible authorities identify priorities and potential measures in a consistent way. The approach involved two broad stages:

1. Identifying possible priorities and potential measures (creating a longlist).
2. Agreeing priorities (shortlisting).

Step 1: Priorities Long List

Whilst reviewing their allocated documents from the evidence list, task and finish group members were asked to copy and paste anything that could be a priority or potential measure in the LNRS into the shared spreadsheet. This produced a collaboratively created long list of existing priorities and potential measures for each of the broad habitat themes.

Step 2: Agreeing Priorities (Shortlisting)

Seven workshop sessions were organised between March and April 2024 to allow stakeholders to review the priorities long list and use them to come up with our shortlist of LNRS priorities. Workshop sessions each focussed on a different theme and covered:

- woodlands, trees and scrub
- moorland, heathland and montane
- grasslands and limestone pavement
- wetland and freshwater
- coastal and estuarine
- built environment and farmland
- people and nature

Each workshop had three activities:

1. To suggest a 20-30 year vision for each habitat theme, starting by reviewing the habitat specific vision in the pilot scheme.
2. Review and confirm the specific habitats included in each habitat theme so that there is a common understanding on what is being discussed, and to make sure nothing was missed.
3. Identify our LNRS priorities, using the long list to come up with approximately five priorities per habitat theme, which were specific, measurable, achievable, relevant, and time-bound (3-10 years) (SMART) and would assist in achieving the long-term vision.

² Natural England (2023) *Identifying and agreeing priorities and potential measures within Local Nature Recovery Strategies: Advice for Responsible Authorities*. Version 1.

Activity 3 involved the following steps, following the advice from Natural England:

1. Review the long list of priorities and group them into recurring themes or priorities.
2. Scope out:
 - co-benefits (priorities should be specifically for the species and habitats that the strategy will focus on supporting)
 - references to site-level locations (priorities should apply to the target habitat or species across the entire LNRS area where possible)
 - priorities that specifically target nationally designated sites
3. Draw on criteria-based factors to further refine the priorities list including:
 - **urgency**: is the issue that the possible priority is aiming to resolve or improve already improving, or is it continuing to get worse
 - **deliverability**: for which habitats and species is the strategy area particularly important, or can make a particular contribution to in terms of creation, enhancement and connectivity
 - **contributions to National Environmental Objectives (NEOs)**: does the possible priority help to deliver one or more of the NEOs
 - **cross-boundary considerations**: which possible priorities align or could join up with those of neighbouring RAs across the boundaries
 - **climate change impacts**: are any habitats likely to be particularly affected by climate change
 - **pre-existing initiatives**: are there any particular opportunities to enhance nature recovery gains made recently in the strategy area or beyond, or otherwise support species projects
4. Propose wording for approximately five draft LNRS priorities per habitat theme.

The printed long-list priorities were retained in their groups so that key contributing documents could be assigned to each priority, as well as a record of those that were scoped out.

The feedback from each workshop was reviewed and compiled to create the draft shortlist of priorities. Once the draft shortlist of priorities was produced, these were presented to the Steering Group who reviewed and finalised them against the following criteria:

- do the agreed priorities and potential measures contribute to a balanced range of the NEOs
- do the agreed priorities address the opportunities and pressures identified in the description of the strategy area
- do the agreed priorities sufficiently cover the variation of landscapes and ecosystems in the strategy area
- do the agreed priorities balance the contributions from different types of stakeholders
- are there a manageable number of agreed priorities
- are there any recurring priorities that could be consolidated into 'overarching priorities

The draft priorities were then posted on the Cumbria LNRS website and circulated via newsletters, so that anyone could read them and provide feedback. This feedback was incorporated into the pre-consultation draft.

There are 27 LNRS priorities for Cumbria, which are presented under their relevant themes in the Statement of Biodiversity Priorities.

7. Identify Potential Measures

Once the draft priorities were finalised, the shared access spreadsheet was modified so that there was a measures tab for each priority. Previously proposed potential measures were moved into the relevant priority tab.

The two-stage approach used for identifying priorities was then repeated to identify potential measures:

1. Identifying potential measures (creating a longlist).
2. Agreeing potential measures (shortlisting).

Step 1: Potential Measures Long List

Stakeholders were invited to repeat the process followed when creating the priorities long-list, by populating the shared access spreadsheets with information from existing action plans and strategies to create a potential measures long-list for each priority.

Step 2: Agreeing potential measures (Shortlisting)

Five workshop sessions were organised in June 2024 to allow stakeholders to review the potential measures long list and use them to come up with our shortlist of LNRS potential measures. Workshop sessions each focussed on a different area of Cumbria, based on National Character Areas, and included:

- Solway Basin and Eden Valley
- Morecambe Bay, Low Fells, WCCP
- North Pennines, Border Moors, Tyne Gap
- Yorkshire Dales, Howgill & Orton Fells
- Cumbria High Fells

Each workshop had two activities:

1. Identifying our potential measures (one habitat theme per table).
2. Reviewing our potential measures (from a landscape perspective).

Activity 1 involved the following steps:

1. Group the potential measures into recurring themes, following the same steps as for priority workshop activity 3.
2. For each priority, identify approximately 10 key potential measures that will help deliver it.
3. Where possible, identify whether the measure is mappable, target habitats/areas (if mappable), any relevant standards or guidance, and any suitable monitoring methods.

Activity 2 involved the following steps:

1. Everyone's shortlisted potential measures were displayed around the room, giving everyone the chance to review all the potential measures, identify any conflicts of interest, anything that wasn't a measure/action, anything that needed strengthening, or anything that had been missed.
2. A conversation session to give participants the opportunity for discussion and feedback.

Once the shortlist of potential measures was produced, these were presented to the Steering Group who reviewed and finalised them against the criteria outlined in section 5.2.

The draft potential measures were then posted on the Cumbria LNRS website and circulated via newsletters, so that anyone could read them and provide feedback. This feedback was incorporated into the pre-consultation draft.

There are 127 potential measures, which are presented under their relevant themes in the Statement of Biodiversity Priorities and listed in full in Appendix A – 'Cumbria LNRS Priorities and Measures Matrix'.

8. Species

The LNRS must also describe opportunities, set priorities, and propose potential measures for the recovery and enhancement of species. Non-statutory advice from Natural England (NE)³ set out an approach to help responsible authorities achieve this goal in a consistent way.

The approach involved two broad stages:

1. Identifying threatened and other locally significant species relevant to the strategy area ('species long list').
2. Determining which of these species should be prioritised for recovery action ('species short list').

³ Natural England (2023) *Species Recovery within Local Nature Recovery Strategies: Advice for Responsible Authorities*. Version 1.

Step 1: The 'Long List'

A 'long-long' list of species that could be considered in the development of the LNRS was compiled by Cumbria Biodiversity Data Centre and included species records within Cumbria which meet the following criteria:

- any native species which have been assessed as Red List Threatened against IUCN criteria (Critically Endangered, Endangered, Vulnerable)
- any native species considered to be nationally extinct that re-establish themselves or are rediscovered (Critically Endangered Possibly Extinct, Regionally Extinct, Extinct in the Wild, Extinct)
- any native species which have not been formally assessed against IUCN Red List criteria but where strong evidence is provided to show that they would meet the criteria for Threatened status
- any native species which have been assessed as Red List Near Threatened against IUCN criteria
- any native species which NE suggest as suitable candidates for conservation translocation, or any native species already subject to translocation efforts (To be provided pending NE translocation data)
- any other species of local significance (Cumbria Local Biodiversity Action Plan Species List, Cumbria Sensitive Species, East of Eden Nature Recovery project, South Cumbria Butterfly & Moth Species Recovery project, JNCC Red data categories JNCC Rare and scarce species)

The 'long-long list' contained approximately 1,700 species which could potentially be considered locally significant to Cumbria. As the non-statutory advice suggested that the species long list should be between 150 and 500 species long; it was clear that the 'long-long list' not only included more species than could be practically included in the LNRS but was also much more comprehensive than the guidance indicated was required.

The species group was granted access to a Microsoft SharePoint folder. An excel spreadsheet of the long-long list was created and saved within the SharePoint Folder for everyone to access. The 'long-long' list was reviewed and refined by relevant technical specialists using the following steps:

1. Each species was assigned to one of the following categories based on the NE non-statutory advice:
 - **critical** (IUCN Red List Threatened, critically endangered or extinct)
 - **important** (IUCN Red List Near Threatened)
 - **local significance** (Other Species of local significance – as above)
 - **pilot** (Species identified in the Cumbria pilot scheme but not captured in the other three lists)
Species which have not been formally assessed against IUCN Red List criteria but where strong evidence is provided to show that they would meet the criteria for Threatened status were captured in the 'local significance' list at this stage.

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- **additional** (any species that professional opinion suggests should be on the long list but do not appear in any of the other tabs)
- 2. Species identified as being incorrect records, extinct in Cumbria, or vagrant / very rare visitors during the pilot work were given a default value to remove from the long list.
- 3. Species where the most recent record pre-dated 2000 were also given a default value to remove from the long list.
- 4. Species in the 'Local Significance' list where there are less than 10 records were once again given a default value to remove from the long list.
- 5. Each species record was then reviewed by at least one relevant specialist, using the qualifying criteria technical knowledge to either keep or exclude records from the long list.

Critical and important species remained on the long list unless they were known to be erroneous records or species that are either vagrants or now extinct in Cumbria

Local significance and pilot species were only kept on the long list if they met one or more of the following criteria:

- species known to be present in the strategy area which have not yet been Red List assessed in GB or lack approved Red Lists but for which there is strong evidence to show (or in the absence of this, authoritative expert opinion) that they would meet criteria for Threatened status
- species which local people suggest as candidates for conservation translocation (must align with the 'Reintroductions and conservation translocations: code and guidance for England')
- local 'champion' species or species which are iconic for / emblematic of the local area

Step 2: Species Short List

Once the long list was agreed, work then began on producing a species priorities list, or short list, focussing on the species which LNRS can best support and reflecting the species issues which are of greatest importance to the strategy area and local people and organisations. The species priorities list was produced by refining the species longlist of stage one, following a three-part method:

1. Identifying species which the LNRS can best support.
2. Grouping species into habitat-based assemblages.
3. Selecting LNRS species priorities.

Identifying species which the LNRS can best support.

The first step in refining the species longlist was to identify the species which the LNRS can best support and those for which the LNRS is not appropriate. This categorisation was done by categorising species based on Natural England's non-statutory advice:

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- each species record on the long list was reviewed by at least one relevant specialist, and classified according to the following criteria:
 - A: needs more / bigger / better-connected habitat
 - B: needs targeted habitat management
 - C: needs improvements in environmental quality
 - D: needs bespoke conservation action/s
 - E: needs better evidence base / on-the-ground action is not a priority
 - F: needs action outside England
 - G: vagrants / occasional visitors
- specialists were also able to provide some commentary on the key pressures facing each species

The short list was made up of species that were categorised as B, C or D.

Grouping species into habitat-based assemblages.

An in-person workshop was held to sort the species short list into groups that share habitat requirements and might thereby benefit collectively from the same recovery measures. Participants were asked to list the species that would go into their chosen assemblage and identify the potential measures that would be needed.

The outputs from the workshop were then added to the species spreadsheet to allow people to continue to review the assemblages, continue adding species to them, and suggest additional assemblages and potential measures.

All short-listed species were sorted into 26 assemblages. The potential measures for the species assemblages were then integrated as additional detail into the wider potential measures on habitat management.

Selecting LNRS priority species.

Once the shortlisted species were sorted into assemblages, the short list was reviewed once more by the species group to identify a small number (20) of LNRS priority species that require very specific potential measures that are over and above the potential measures identified for the habitat-based assemblages. This was done initially at an in-person workshop, focussing on Category D species, and aiming to identify 1-2 species per taxon group/broad habitat theme. The LNRS priority species were identified based on:

- **urgency:** do any species / assemblages stand out as having particularly urgent recovery requirements
- **deliverability:** how feasible will it be to deliver the recovery measures required by a species / assemblage
- **contributions to national species recovery:** is the strategy area of national (or international) significance for the conservation of any species / assemblages
- **cross-boundary considerations:** are there any particular opportunities to join up species recovery plans across LNRS boundaries?

- **maximising benefits:** would the recovery of a species /assemblage be likely to bring about other biodiversity and environmental benefits?
- **climate change impacts:** are any species / assemblages likely to be particularly affected by climate change
- **pre-existing initiatives:** are there any particular opportunities to enhance species recovery gains made recently in the strategy area or beyond, or otherwise support species projects

The outputs from the workshop were then added to the species spreadsheet to allow people to continue to review the LNRS priority species list, suggest additional species, and suggest additional potential measures.

There are a total of 24 habitat-based assemblages and 24 priority species in the Cumbria LNRS.

9. Local Habitat Map

Cumbria LNRS habitat basemap

The mapping work was led by Cumbria Biodiversity Data Centre (CBDC). The Cumbria LNRS habitat basemap was first developed in 2020 as part of the Cumbria Local Nature Recovery Strategy pilot funded by Defra and led by Cumbria County Council in partnership with CBDC, Cumbria Local Nature Partnership (CLNP), and a wide range of organisations across the county.

Since 2022, Westmorland and Furness Council has worked with CBDC, local partners, and national organisations to update the LNRS habitat basemap GIS layer. The process began with an 'audit' initiated by the CLNP to identify relevant habitat datasets and ensure the basemap was based on the best available evidence. Data collected from partners underwent a thorough review by CBDC to assess its suitability and quality, ensuring it was fit for purpose. Where necessary, the data was reclassified to align with the UK Priority Habitat classification (Figure 3).

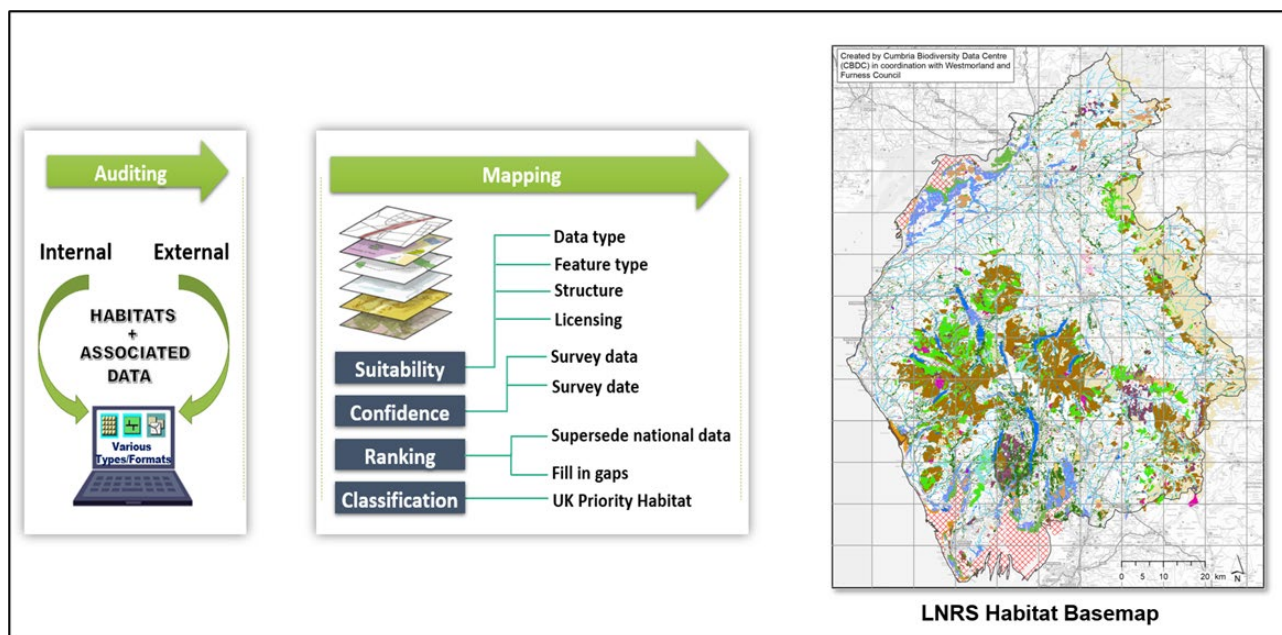


Figure 3 LNRS habitat basemap mapping process

The Cumbria LNRS habitat basemap has been developed from a large number of national and local datasets. It brings together the best of the local and national habitat data onto one Cumbria-wide map. Although we have used the best available information, the habitat maps may not be 100% accurate due to the type of surveying and the age of data. Some important habitats may have been missed during surveys and others may have been damaged or replaced since the surveys were completed. It is therefore very important to re-survey land before making decisions around land management change or potential development. Table 1 shows the sources of the mapped data.

Table 1: Data sources for the LNRS habitat basemap

Datasets	Source
Natural England and CLNP (2022) County Wildlife Sites systems and database update using FEP (HLS) data project	Cumbria Biodiversity Data Centre (CBDC)
Phase 1 Survey of Cumbria (1983-1987)	Cumbria Biodiversity Data Centre (CBDC)
Farm Environment Plan (FEP) (2016)	Cumbria Biodiversity Data Centre (CBDC)
RSPB: Orton Project - Habitat Survey	Cumbria Biodiversity Data Centre (CBDC)
East of Eden Nature Recovery (2024): Digitisation of Phase 1 Habitat Survey	Cumbria Biodiversity Data Centre (CBDC)
ELMS Project: Forgotten Land 2022	Cumbria Biodiversity Data Centre (CBDC)
Fellfoot Forward Landscape Partnership Scheme (2020 - 2024): Habitat Survey	Cumbria Biodiversity Data Centre (CBDC)
CWT Cumbria Tarns Project 2003-2009	Cumbria Wildlife Trust (CWT)

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Datasets	Source
Bennett Ash (2008) Reedbed Mapping Project for Cumbria. A Report on Behalf of Cumbria Wildlife Trust Environment Agency	Cumbria Wildlife Trust (CWT)
Cumbria Wildlife Trust: Cumbria Peat Mapping Report (2024)	Cumbria Wildlife Trust (CWT)
Cumbria Wildlife Trust: Juniper Survey Project (2011-2013)	Cumbria Wildlife Trust (CWT)
Cumbria Wildlife Trust Meadow Survey Data (2021)	Cumbria Wildlife Trust (CWT)
County Wildlife Sites (CWS) habitat review (2021)	Cumbria Wildlife Trust (CWT)
National Forest Inventory GB 2022	Forestry Commission
IECS (2002) Mapping, Condition and Conservation Assessment of Honeycomb Worm Sabellaria alveolata Reef	Institute for Estuarine and Coastal Studies, University of Hull
Hay Meadows data was collected between 1978 and 1980 in surveys organised by the Lake District Special Planning Board and the Nature Conservancy Council England Field Unit	Lake District National Park Authority (LDNPA)
Reedbeds layer created by South Cumbria River Trust for the LDNPA. It includes surveys done from a boat in October 2012 around the shore of Windermere.	Lake District National Park Authority (LDNPA)
Created by extracting ecological information from the survey of hay meadows (1978-1980)	Lake District National Park Authority (LDNPA)
Priority Habitats Inventory (England) (2022)	Natural England
Wood Pasture and Parkland Inventory (WPPI) Lake District March 2022 Version 1.2	Natural England
Wood Pasture and Parkland Inventory (WPPI) North Pennines 2023 version 1.1	Natural England
Ancient Woodland Inventory (AWI)	Natural England
Graeme Skelcher - aerial photograph/ PROW survey	Natural England and Arnside & Silverdale National Landscape
Graeme Skelcher - AONB County Wildlife Site Surveys/aerial photograph	Arnside & Silverdale National Landscape
Graeme Skelcher - More Thwaite management plan (2006)	Natural England and Arnside & Silverdale National Landscape
Graeme Skelcher - Survey of wooded limestone pavement in the Arnside/Silverdale AONB (2005)	Natural England and Arnside & Silverdale National Landscape
Graeme Skelcher - Morecambe Bay Pavements cSAC NVC survey of Underlaid, Marble Quarry & Middlewood	Natural England and Arnside & Silverdale National Landscape

Datasets	Source
North Pennines AONB Partnership - Habitat Survey	North Pennines National Landscape
OS Open Rivers (October 2024)	Ordnance Survey
YDNPA Habitat Basemap (2024)	Yorkshire Dales National Park Authority (YDNPA)

Map areas of particular importance for biodiversity.

Every Local Habitat Map must identify all national conservation sites and local nature reserves. They should also include:

- all existing local wildlife sites
- areas of irreplaceable habitat
- other areas identified by the Secretary of State as being of particular importance

The following designated sites were included as areas of particular importance for biodiversity in Cumbria:

- all national conservation sites (Special Protection Areas, Special Areas of Conservation, Ramsar sites, Sites of Special Scientific Interest, National Nature Reserves, Local Nature Reserves, and Limestone Pavement Orders)
- County Wildlife Sites

The Cumbria habitat basemap was used to identify the location of irreplaceable habitats within Cumbria, including:

- ancient woodland (including ancient wood pasture and parkland)
- ancient and veteran trees
- blanket bog
- limestone pavements
- coastal sand dunes
- lowland fens

The process for mapping areas of particular importance for biodiversity is outlined in the statutory guidance and shown in Figure 4. The map showing Areas of Particular Importance for Biodiversity is shown in Figure 5.

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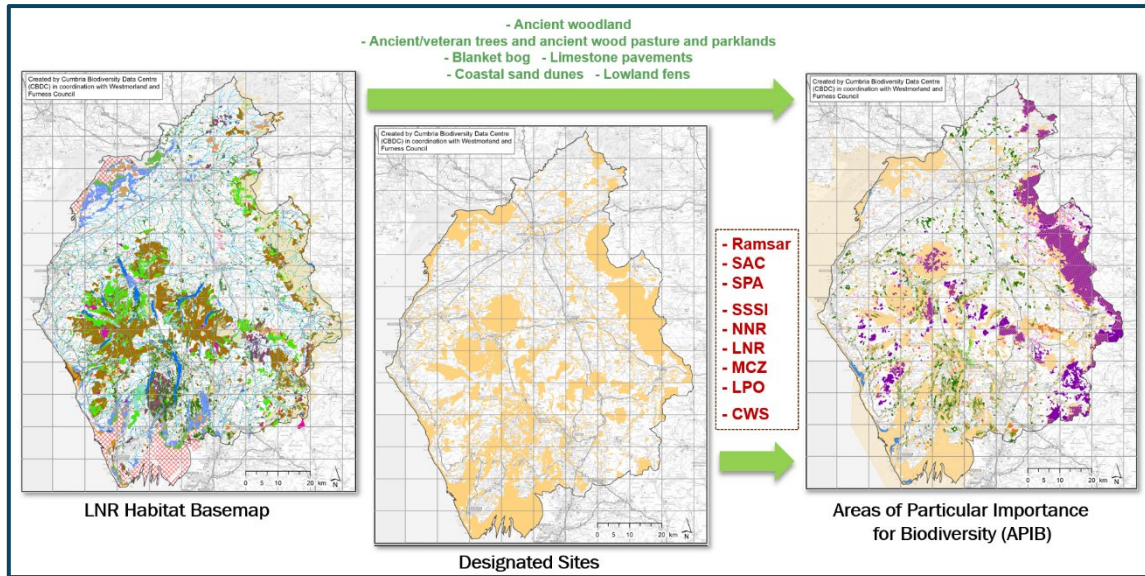


Figure 4: Process for mapping areas of particular importance for biodiversity

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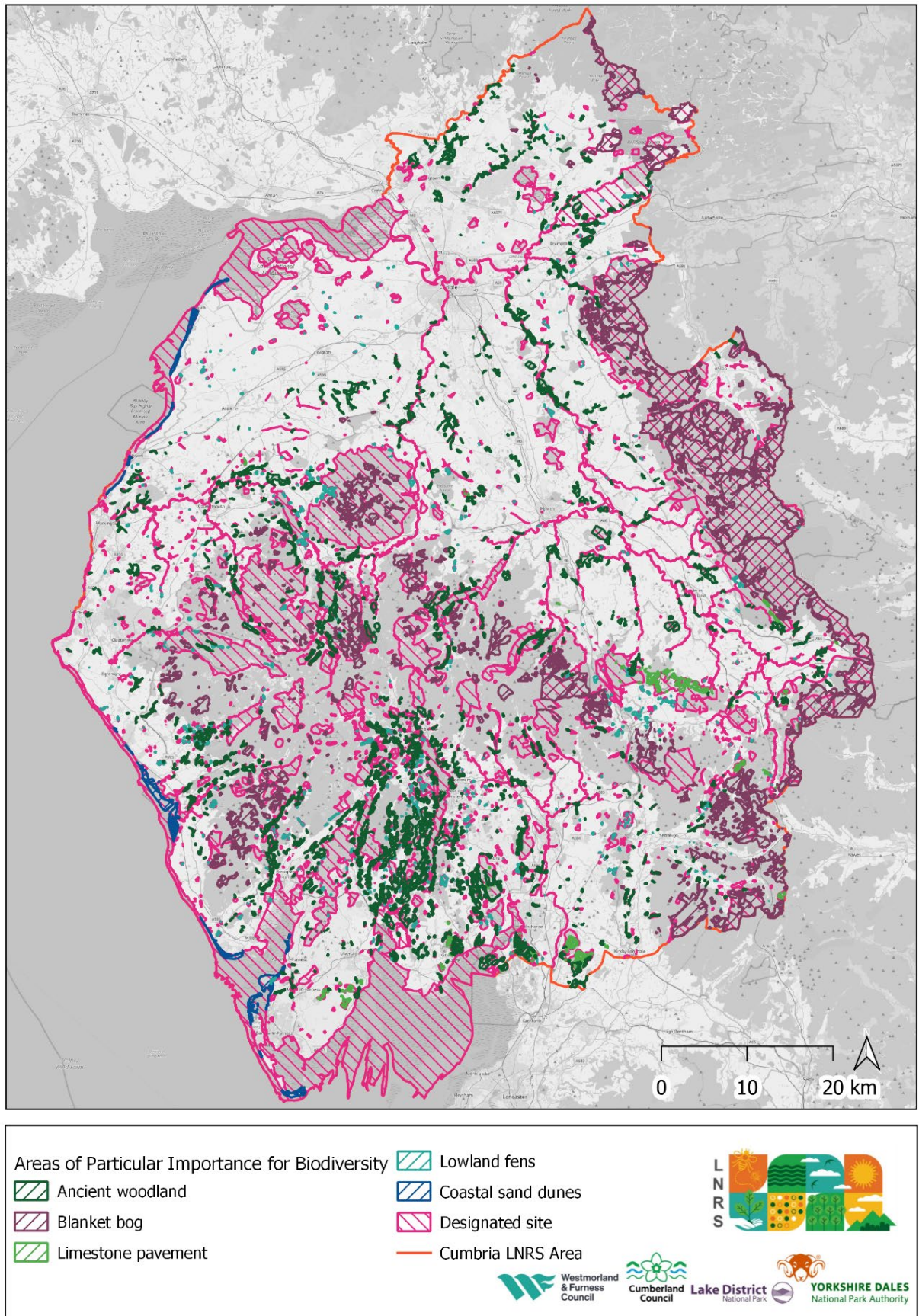


Figure 5: Areas of Particular Importance for Biodiversity

Map areas that could become of particular importance.

Network Models

Various habitat modelling tools (including Condatis, Linkage Pathways, ESRI Suitability Modeler) were considered as part of the pilot and reviewed as part of the LNRS development process. The LNRS Spatial Planning Group decided to continue with the use of Natural England's England Habitat Network model⁴ for mapping the Cumbria LNRS Habitat Network Maps, as this was what was agreed on during the pilot and was felt to be successful. The Habitat Network model utilises individual (primary) wildlife-rich habitats from the Cumbria LNRS Habitat Basemap, along with their associated habitats (Table 2), and incorporates other datasets (Table 3) to identify zones that could be suitable for the restoration or creation of additional wildlife-rich habitats. These are the areas where actions for nature recovery should be prioritised to make our existing wildlife-rich habitats bigger and more joined up.

Table 2: LNRS primary and associated habitats

Primary habitats	Associated habitats
Ancient Woodland (ASNW)	Deciduous Woodland, Wood-Pasture & Parkland, Traditional Orchards.
Blanket Bog	Upland Flushes Fens & Swamps, Lakes, Upland Heathland (not on deep peat).
Broadleaved Woodland	Lowland Meadows, Lowland Calcareous Grassland, Lowland Acid Grassland, Lowland Heath, Lowland Fen, Purple Moor-grass & Rush Pasture, Limestone Pavement, Upland Calcareous Grassland, Traditional Orchards, Ancient Semi-Natural Woodland, Wood-Pasture & Parkland.
Coastal Sand Dunes	Coastal Saltmarsh, Coastal Vegetated Shingle, Saline Lagoons, Lowland Acid Grassland, Lowland Calcareous Grassland, Lowland Heath, Reedbed.
Coastal Saltmarsh	Coastal Sand Dunes, Coastal Vegetated Shingle, Mudflats, Saline Lagoons, Reedbed.
Coastal Vegetated Shingle	Coastal Sand Dunes, Coastal Saltmarsh, Saline Lagoons, Lowland Acid Grassland, Lowland Calcareous Grassland, Lowland Heath, Reedbed.
Lowland Acid Grassland	Coastal Sand Dunes, Coastal Vegetated Shingle, Lowland Calcareous Grassland, Lowland Fen, Lowland Heath, Lowland Meadows, Maritime Cliff & Slope.
Lakes	Blanket Bog, Calaminarian Grassland, Coastal Saltmarsh, Coastal Sand Dunes, Coastal Vegetated Shingle, Limestone Pavement, Lowland Calcareous Grassland, Lowland Acid Grassland, Lowland Fen, Lowland Heath, Lowland Meadows, Lowland Raised Bog, Maritime Cliff & Slope, Mudflats, Purple Moor-grass & Rush

⁴ Edwards J, Knight M, Taylor S & Crosher I. E (May 2020) 'Habitat Networks Maps, User Guidance v.2', Natural England.

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Primary habitats	Associated habitats
	Pasture, Reedbed, Saline Lagoons, Traditional Orchards, Upland Calcareous Grassland, Upland Flushes Fens & Swamps, Upland Hay Meadow, Upland Heathland, Wood-Pasture & Parkland.
Lowland Calcareous Grassland	Coastal Sand Dunes, Coastal Vegetated Shingle, Lowland Acid Grassland, Lowland Meadows, Limestone Pavement, Maritime Cliff & Slope, Upland Calcareous Grassland, Calaminarian Grassland, Lowland Fen.
Lowland Fen	Calaminarian Grassland, Lowland Acid Grassland, Lowland Calcareous Grassland, Lowland Heath, Lowland Meadows, Lowland Raised Bog, Limestone Pavement, Purple Moor-grass & Rush Pasture, Reedbed, Upland Calcareous Grassland, Upland Flushes Fens & Swamps, Upland Hay Meadow.
Lowland Heath	Lowland Acid Grassland, Lowland Fen, Maritime Cliff & Slope, Lowland Raised Bog, Purple Moor-grass & Rush Pasture, Lowland Meadows, Calaminarian Grassland.
Lowland Meadows	Lowland Acid Grassland, Lowland Calcareous Grassland, Lowland Fen, Maritime Cliff & Slope, Purple Moor-grass & Rush Pasture, Traditional Orchards, Wood-Pasture & Parkland, Upland Hay Meadow, Coastal Sand Dunes.
Lowland Raised Bog	Lowland Acid Grassland, Lowland Fen, Lowland Heath, Purple Moor-grass & Rush Pasture, Reedbed.
Limestone Pavement	Upland Calcareous Grassland, Upland Hay Meadow, Upland Flushes Fens & Swamps, Calaminarian Grassland, Lowland Calcareous Grassland, Lowland Fen.
Maritime Cliff & Slope	Lowland Acid Grassland, Lowland Calcareous Grassland, Lowland Heath, Lowland Meadows.
Purple Moorgrass & Rush Pasture	Lowland Fen, Lowland Meadows, Lowland Raised Bog, Reedbed, Lowland Heath, Lowland Acid Grassland, Upland Hay Meadow.
Reedbed	Lowland Fen, Lowland Meadows, Lowland Raised Bog, Purple Moor-grass & Rush Pasture, Coastal Saltmarsh, Coastal Sand Dunes, Coastal Vegetated Shingle, Saline Lagoons, Rivers, Lakes.
Rivers	Blanket Bog, Calaminarian Grassland, Coastal Saltmarsh, Coastal Sand Dunes, Coastal Vegetated Shingle, Limestone Pavement, Lowland Calcareous Grassland, Lowland Acid Grassland, Lowland Fen, Lowland Heath, Lowland Meadows, Lowland Raised Bog, Maritime Cliff & Slope, Mudflats, Purple Moor-grass & Rush Pasture, Reedbed, Saline Lagoons, Traditional Orchards, Upland Calcareous Grassland, Upland Flushes Fens & Swamps, Upland Hay Meadow, Upland Heathland, Wood-Pasture & Parkland, Lakes.
Upland Calcareous Grassland	Limestone Pavement, Upland Flushes Fens & Swamps, Upland Hay Meadow, Calaminarian Grassland, Lowland Calcareous Grassland, Lowland Meadows, Purple Moor-grass & Rush Pasture.

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Primary habitats	Associated habitats
Upland Flushes Fens & Swamps	Lowland Fen, Blanket Bog, Upland Calcareous Grassland, Upland Heathland, Upland Hay Meadow.
Upland Heathland	Blanket Bog, Upland Calcareous Grassland, Calaminarian Grassland, Upland Flushes Fens & Swamps, Lowland Heath, Lowland Acid Grassland, Lowland Fen, Purple Moor-grass & Rush Pasture, Lowland Calcareous Grassland, Limestone Pavement.
Upland Hay Meadow	Limestone Pavement, Lowland Meadows, Purple Moor-grass & Rush Pasture, Lowland Acid Grassland, Lowland Fen, Lowland Calcareous Grassland, Calaminarian Grassland, Upland Calcareous Grassland, Upland Flushes Fens & Swamps.
Wood-Pasture & Parkland	Lowland Meadows, Lowland Calcareous Grassland, Lowland Acid Grassland, Lowland Heath, Lowland Fen, Purple Moor-grass & Rush Pasture, Limestone Pavement, Upland Calcareous Grassland, Traditional Orchards, Ancient Semi-Natural Woodland.
Traditional Orchards	Lowland Calcareous Grassland, Lowland Acid Grassland, Lowland Fen, Lowland Meadows, Purple Moor-grass & Rush Pasture.

Table 3: Other data sources used in the Habitat Network Modelling

Datasets	Source
UK Lakes Database (2004)	Centre for Ecology and Hydrology (CEH)
Land Cover Map 2023 (LCM2023)	Centre for Ecology and Hydrology (CEH)
NATMAP soilscapes - National Soil Map	Cranfield University
Peatland Restoration Site (2024)	Cumbria Wildlife Trust (CWT) 'Peatland Conservation project'
Habitat Creation Restoration (2024)	Cumbria Wildlife Trust (CWT) 'Planting for Pollinators Project (PFP)'
Agri-environment schemes data (2019)	DEFRA
LIDAR Composite DTM 2019 - 10m	Environment Agency
Flood Map for Planning (Rivers and Sea) Flood Zone 2	Environment Agency
Flood Map for Planning (Rivers and Sea) Flood Zone 3	Environment Agency
National Forest Inventory Woodland GB (2022)	Forestry Commission
Inventories for the Alkaline Fen and Transition Mire and Quaking Bog Annex 1 habitats in England	Natural England
Ancient Woodland England (2024)	Natural England
National Seagrass Layer England (2024)	Natural England
Wood Pasture and Parkland England	Natural England
Priority Habitat Inventory (PHI) (2022)	Natural England
Green Infrastructure delivery (2016)	Natural England

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Datasets	Source
PTES Traditional Orchards HAP data layer	Natural England
Peaty Soils Location (2024)	Natural England
Unobserved Gill Model (2023)	North Pennines National Landscape
Urban Settlements (2023)	OS MasterMap
Priority Rivers Habitat Map	OS MasterMap
RPA Land Cover	Rural Payments Agency (RPA)
Habitat Creation Restoration	West Cumbria Rivers Trust (WCRT)
Ancient Tree Inventory (2024)	Woodland Trust

A habitat network was created for each primary habitat with a model available. The habitat network maps are made up of eight classes which are categorised into existing habitat or network enhancement and expansion opportunity.

Existing Habitats are existing potentially wildlife-rich habitats, which need to be conserved, enhanced or restored (i.e. better) and include the following habitat network layers:

- **Primary habitat:** the priority habitat which is the focus of the individual habitat network
- **Associated habitat:** other priority habitat types that form a mosaic or an ecologically coherent group within the landscape and may, for example, be essential for some species associated with the primary habitat
- **Habitat creation/restoration:** areas where work is underway to either create or restore the primary habitat
- **Restorable habitat:** areas of land, predominantly composed of existing semi-natural habitat where the primary habitat is present in a degraded or fragmented form and which are likely to be suitable for restoration

Network Enhancement & Expansion are the areas which could be suitable for restoration or creation to make our wildlife-rich habitats bigger and more joined up and include the following habitat network layers:

- **network enhancement zone 1:** land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat (*factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here*)
- **network enhancement zone 2:** land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat (*action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here*)
- **fragmentation action zone:** land within enhancement zone 1 that connects existing patches of primary and associated habitats which are currently highly fragmented and where fragmentation could be reduced by habitat creation

(action in this zone to address the most fragmented areas of habitat can be targeted here)

- **network expansion zone:** land beyond the network enhancement zones with potential for expanding, linking/joining networks across the landscape i.e. conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to enhancement zone 1 *(action in this zone to improve connections between existing habitat networks can be targeted here)*

The Habitat Network Model was used to create 24 individual habitat networks (Table 2) showing the eight classes identified above.

Combined Habitat Networks

Following the Cumbria LNRS pilot and consultation with the Spatial Planning Group and Steering Group, it was agreed that grouping the LNRS habitat networks would help better identify potential opportunities and provide a more comprehensive understanding of habitat conservation across the landscape. Discussions highlighted the importance of considering a broader range of habitats rather than focusing solely on a single priority habitat. The LNRS individual habitat networks were grouped into the following broad habitat themes:

- woodland, trees and scrub
- moorland, heathland and montane
- grassland and limestone pavement
- wetland and freshwater
- coastal and estuarine

In addition to the primary habitats initially identified in Table 2, consultation with stakeholders led to the inclusion of Coniferous Woodland and Plantation on Ancient Woodland Sites (PAWS) as primary habitats within the combined Woodland Trees and Scrub network. Similarly, seagrass beds, mudflats, rocky shores, and *Sabellaria alveolata* reefs were added as primary habitats to the combined Coastal and Estuarine network.

The habitat theme networks were then grouped again to form one overall Local Nature Recovery Network.

It was also agreed by the Spatial Planning group that the eight classes produced by the Habitat Network Model were not particularly intuitive or easy to understand by the general public. Instead, the eight classes were grouped into four main categories:

- enhance
- restore
- create
- not allocated

Enhance includes the improvement of **existing wildlife-rich habitats** (e.g. upland hay meadow) to give better condition or distinctiveness of habitat. This is the focus of the network model.

Restore applies to **degraded or fragmented habitats that are not currently classed as wildlife-rich**. Associated potential measures would result in improving their condition or distinctiveness to make them wildlife-rich where the **broad habitat type would stay the same** (e.g. modified grassland being transformed into hay meadow).

Create is on land that could be suitable for the **creation of wildlife-rich habitat and would result in a broad change in habitat type** (e.g. modified grassland being transformed into broadleaved woodland). This will make our existing wildlife-rich habitats bigger and more joined up.

Not allocated are the areas that are not identified as a strategic location for the delivery of any of the mappable potential measures.

The process for grouping the habitat networks and the network classes is outlined in Table 4 (page 29) and Figure 6. When displaying the network classes by broad habitat theme, the associated habitats were not shown; this is because an associated habitat in one network is a primary (or enhance) part of another network.

Due to the large proportion of Cumbria that is under landscape scale designations and the lack of condition data available for our designated sites, the network models were retained in their entirety, rather than being reduced to only those areas outside of mapped Areas of Particular Importance for Biodiversity.

The overall Local Nature Recovery Network is shown in Figure 7. The grouped habitat networks are shown in Figures 8-12 at the end of this document.

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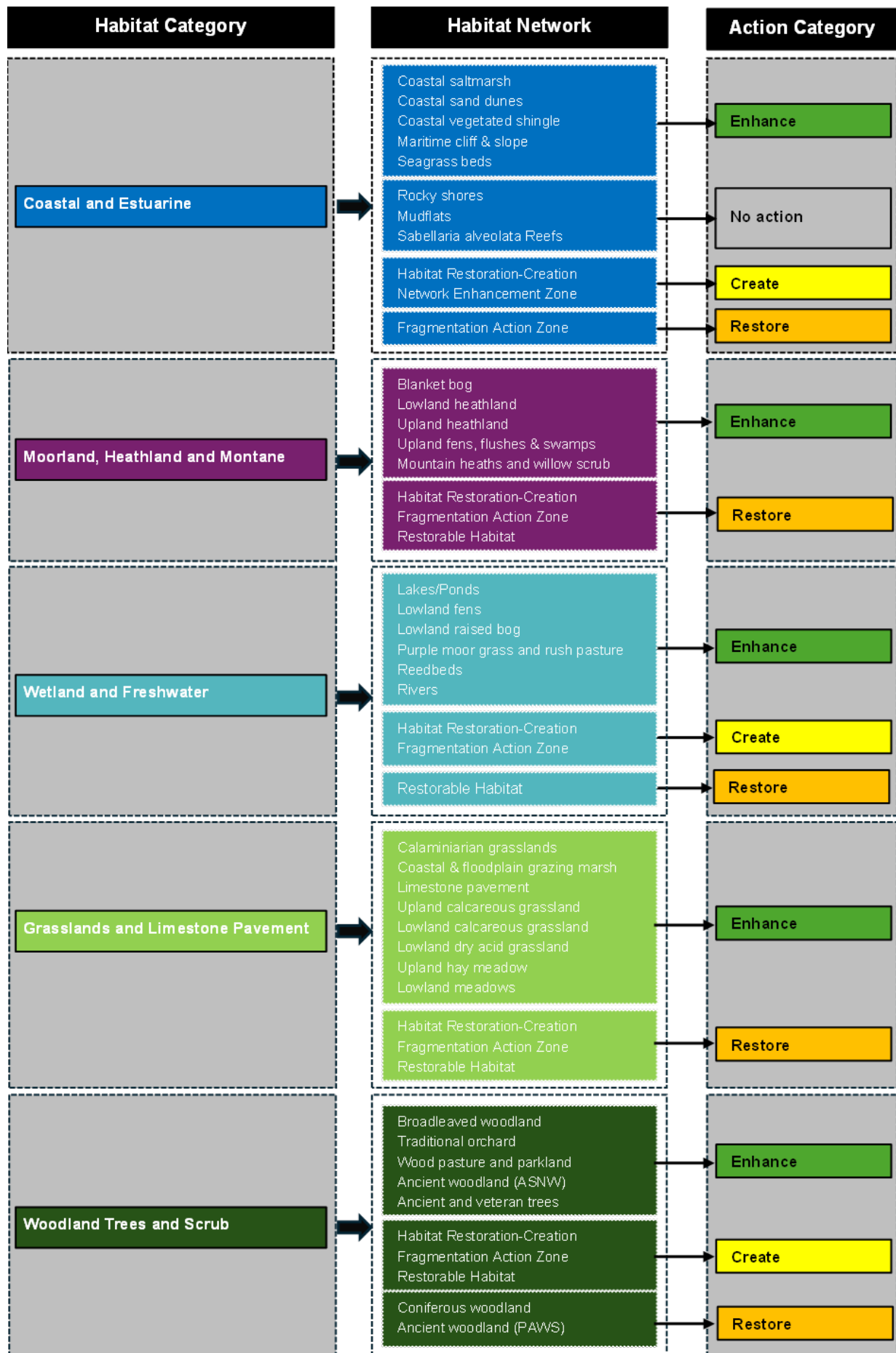


Figure 6: LNRS Habitat networks grouping process

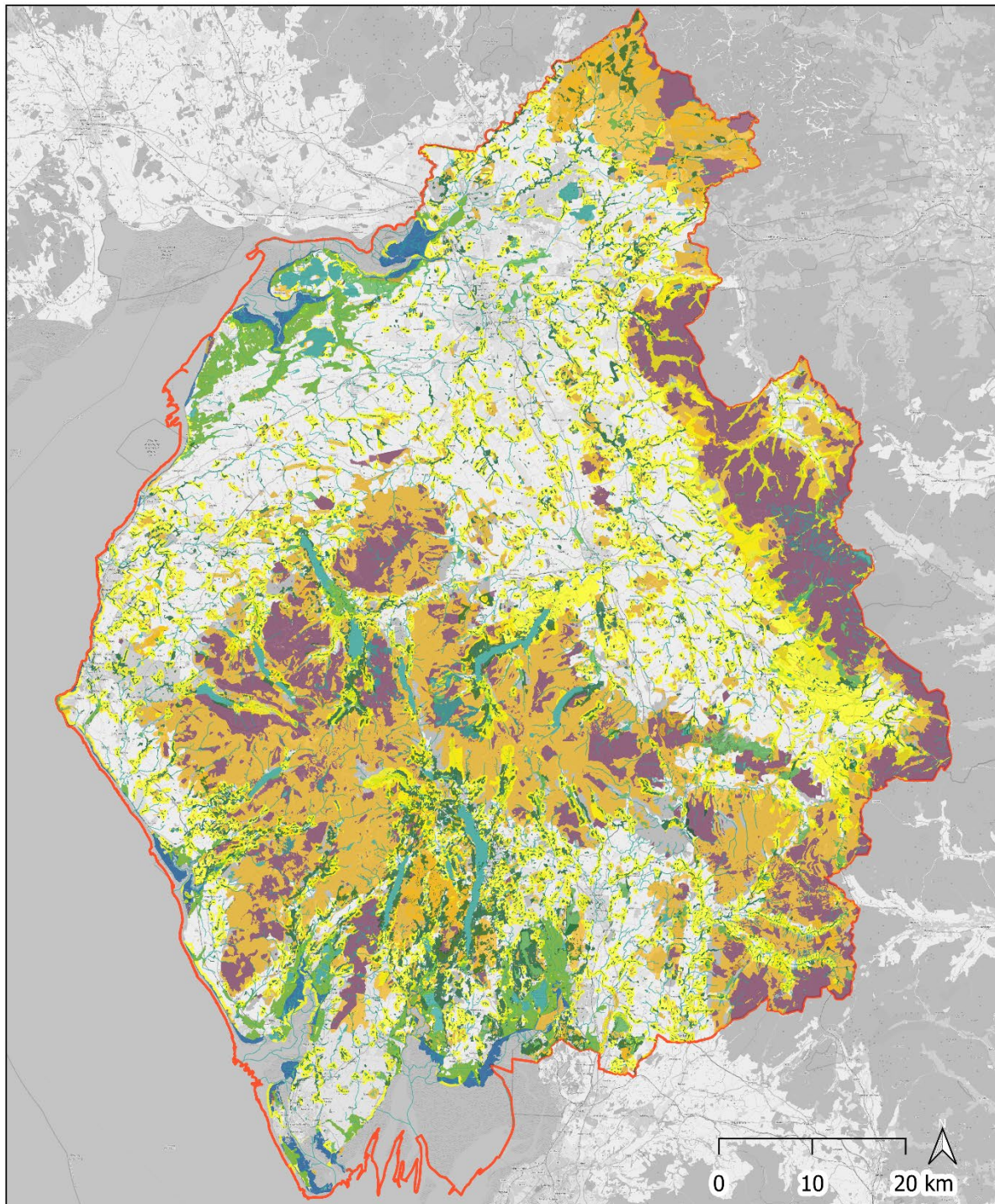


Figure 7: Overall Local Nature Recovery Network

Mapping potential measures

Once the nature recovery networks were modelled, an in-person workshop was held with the Spatial Planning group to review the draft potential measures, decide which potential measures could be mapped, and assign the mappable potential measures to different parts of the networks.

Potential measures were not considered mappable where:

- they did not relate to or support habitat creation or improvement
- they would be similarly beneficial over wide areas
- carrying out the potential measure would not have sufficient impact to increase the potential to become of particular importance for biodiversity
- it was not possible to find a suitable location to carry out the potential measure

Potential measures were considered mappable where they directly related to habitat creation, restoration or enhancement. For each mappable measure the following information was provided:

- the relevant habitat
- the layers of the model that the mappable measure applies to
- whether the measure would be considered as enhancement, restoration or creation

The wording of the potential measure was then reviewed to check that it reflected the habitat and model layer it was mapped to. This information was then provided to CBDC who assigned the mappable potential measures to the relevant areas of the networks and uploaded the data to an interactive online portal to allow the data to be interrogated by a variety of users.

Four interactive mapping workshops were held in to launch the draft mapping work. Three workshops were open to anyone; the fourth was aimed at land agents, surveyors and foresters. The workshops allowed people to explore the Local Habitat Map and provide feedback on three questions:

1. How is the **functionality** of the mapping system? i.e. Is it logical? Easy to use? Can you find what you want? Anything to improve?
2. Is the map **accurate**? Can you see anything that does not correspond to your knowledge on the ground?
3. Do you know of any **existing or upcoming projects** that may affect the mapping? Any other constraints?

The feedback from the workshops was then used to further refine and update the habitat network maps. Refinements were limited to changes that could be made with a blanket approach, rather than by making individual changes on a site-by-site basis. Where additional spatial habitat data was provided, this was added to the habitat basemap where suitable, to inform the Network Model. Where suitable spatial information on confirmed

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projects was provided, this was added to the Network Model as 'habitat restoration/creation'.

As the potential measures had also been refined and updated at this time, the potential measures allocated to each network component were also double checked. The finalised potential measures and part of the habitat network they are allocated to are shown in Table 4.

Table 4: LNRS Habitat Network components and the potential measures mapped to them.

Habitat Groups	Combined Habitat Networks	Broad Habitat Networks	Potential Measures
Woodland trees and scrub	Broadleaved woodland	Enhance	M30
Woodland trees and scrub	Wood-pasture & parkland	Enhance	M46
Woodland trees and scrub	Traditional orchards	Enhance	M31
Woodland trees and scrub	Ancient semi-natural woodland	Enhance	M30
Woodland trees and scrub	Ancient and veteran trees	Enhance	M48
Woodland trees and scrub	PAWS	Restore	M47
Woodland trees and scrub	Coniferous woodland	Restore	M30
Woodland trees and scrub	Restorable Habitat	Create	M39, M53
Woodland trees and scrub	Fragmentation Action Zone	Create	M39, M53
Woodland trees and scrub	Habitat Restoration-Creation	Create	M39, M53
Woodland trees and scrub	Where Network Enhancement Zone 2 from the ancient woodland network overlaps with the Create part of the woodland network	Create	M40
Moorland, heathland and montane	Blanket bog	Enhance	M55, M56
Moorland, heathland and montane	Lowland heathland	Enhance	M61
Moorland, heathland and montane	Upland heathland	Enhance	M55, M56
Moorland, heathland and montane	Upland fens, flushes & swamps	Enhance	M96
Moorland, heathland and montane	Mountain heath and willow scrub	Enhance	M65
Moorland, heathland and montane	Restorable Habitat	Restore	M55, M56, M57, M60
Moorland, heathland and montane	Fragmentation Action Zone	Restore	M55, M56, M57, M60
Moorland, heathland and montane	Habitat Restoration-Creation	Restore	M55, M56, M57, M60
Grassland and limestone pavement	Lowland calcareous grassland	Enhance	M70, M71

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Habitat Groups	Combined Habitat Networks	Broad Habitat Networks	Potential Measures
Grassland and limestone pavement	Lowland dry acid grassland	Enhance	M70, M71
Grassland and limestone pavement	Lowland meadows	Enhance	M70, M71
Grassland and limestone pavement	Upland calcareous grassland	Enhance	M70, M71
Grassland and limestone pavement	Upland hay meadows	Enhance	M70, M71
Grassland and limestone pavement	Calaminarian grasslands	Enhance	M72
Grassland and limestone pavement	Coastal floodplain and grazing marsh	Enhance	M78
Grassland and limestone pavement	Limestone pavements	Enhance	M79
Grassland and limestone pavement	Restorable Habitat	Restore	M71 ⁵
Grassland and limestone pavement	Fragmentation Action Zone	Restore	M71 ⁵
Grassland and limestone pavement	Habitat Restoration-Creation	Restore	M71 ⁵
Wetland and freshwater	Lakes/Ponds	Enhance	M82
Wetland and freshwater	Lowland fens	Enhance	M96
Wetland and freshwater	Lowland raised bog	Enhance	M94
Wetland and freshwater	Purple moor grass and rush pasture	Enhance	M96
Wetland and freshwater	Reedbeds	Enhance	M96
Wetland and freshwater	Rivers (NE)	Enhance	M82
Wetland and freshwater	Restorable Habitat	Restore	M82, M95
Wetland and freshwater	Fragmentation Action Zone	Create	M82, M95
Wetland and freshwater	Habitat Restoration-Creation	Create	M82, M95
Coastal and estuarine	Coastal Saltmarsh	Enhance	M106
Coastal and estuarine	Coastal sand dunes	Enhance	M105
Coastal and estuarine	Coastal vegetated shingle	Enhance	M105
Coastal and estuarine	Maritime cliff and slope	Enhance	M105
Coastal and estuarine	Seagrass beds	Enhance	M108
Coastal and estuarine	Fragmentation Action Zone	Restore	M111 ⁶
Coastal and estuarine	Habitat Restoration-Creation	Create	M111 ⁶
Coastal and estuarine	Network Enhancement Zone 1	Create	M111 ⁶

⁵ M77 applies for creation of wildlife-rich grassland on non-grassland habitats.

⁶ M112 applies for creation of saltmarsh

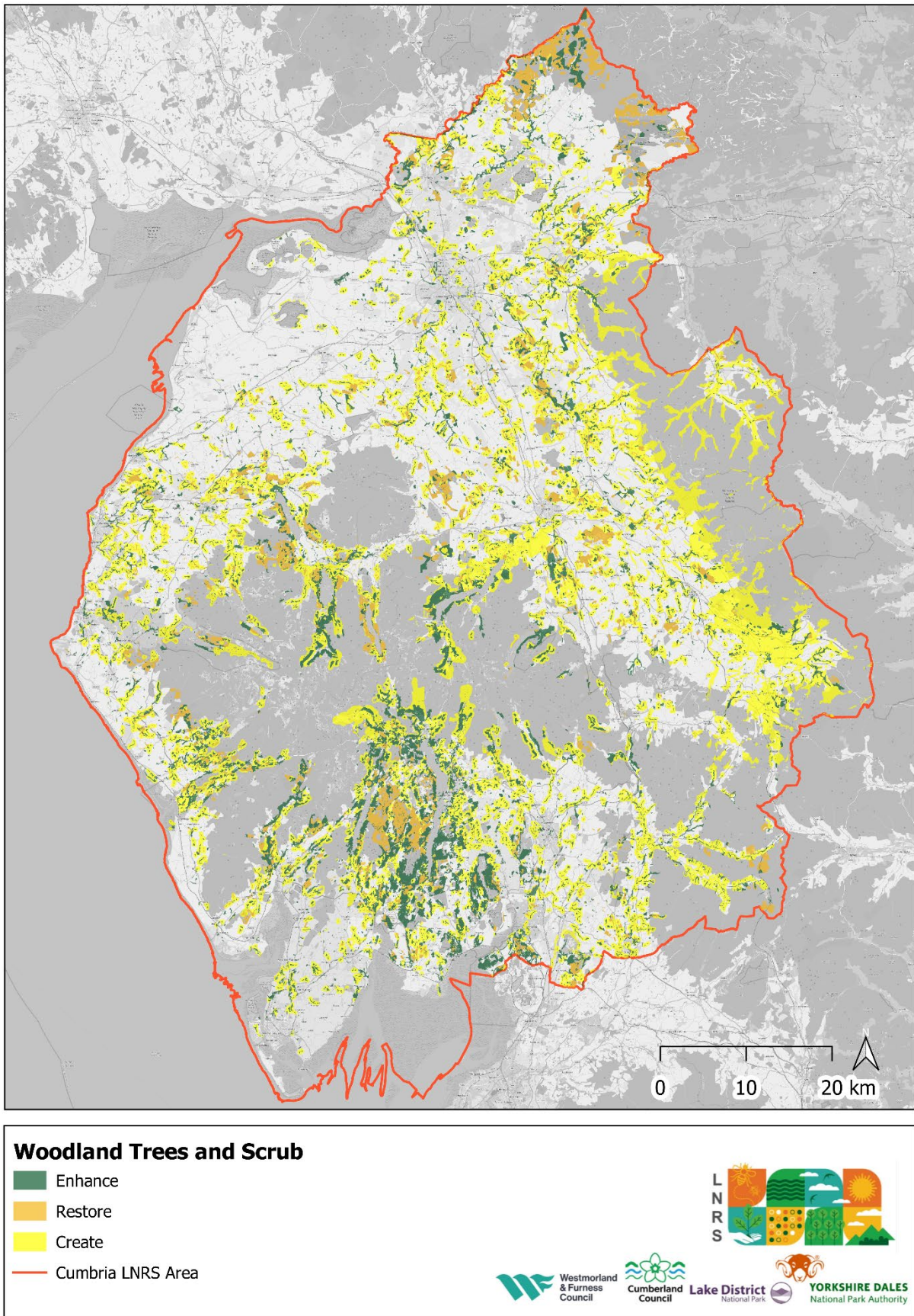


Figure 8: Local Nature Recovery Network for Woodlands Trees and Scrub

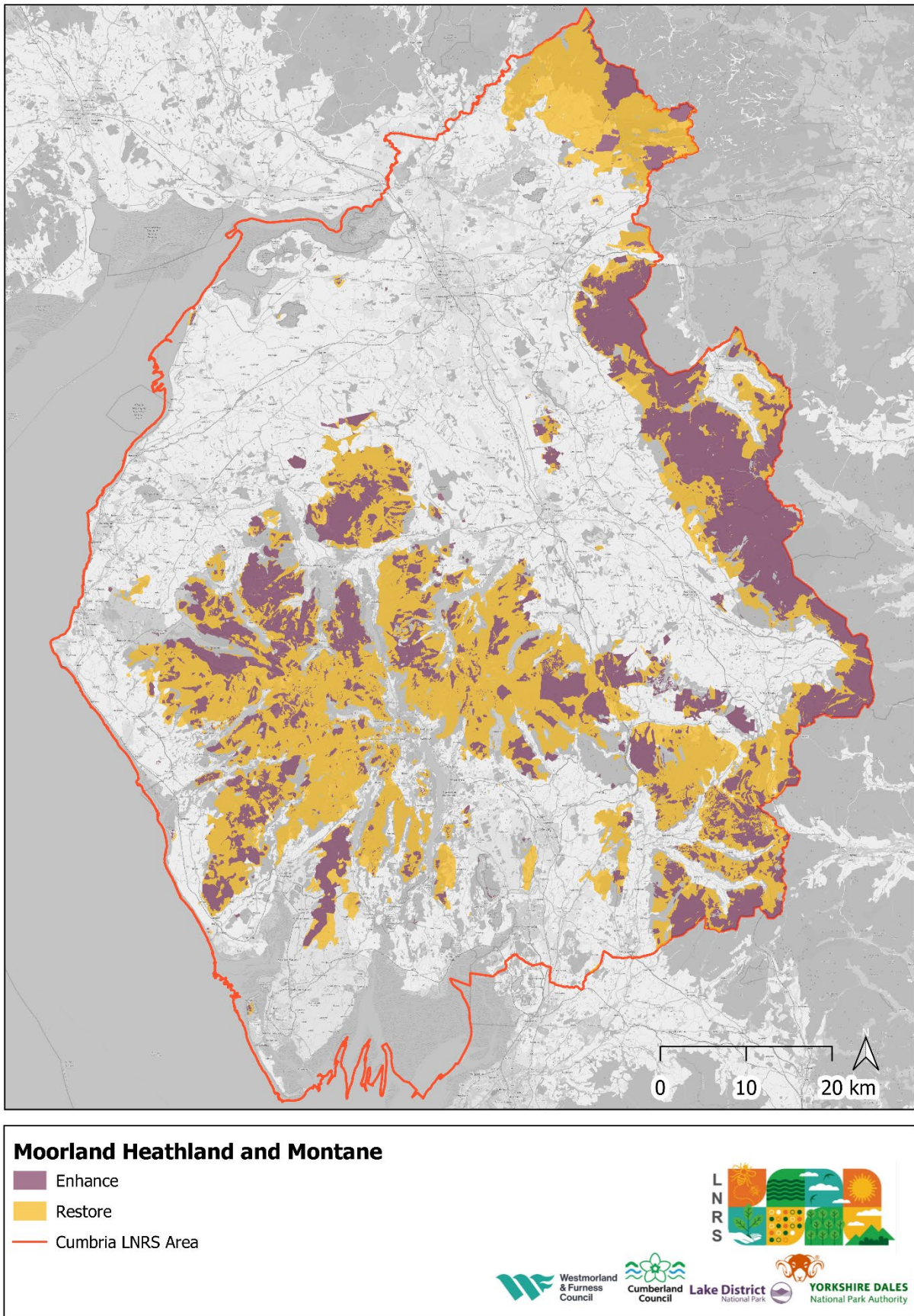


Figure 9: Local Nature Recovery Network for Moorland Heathland and Montane

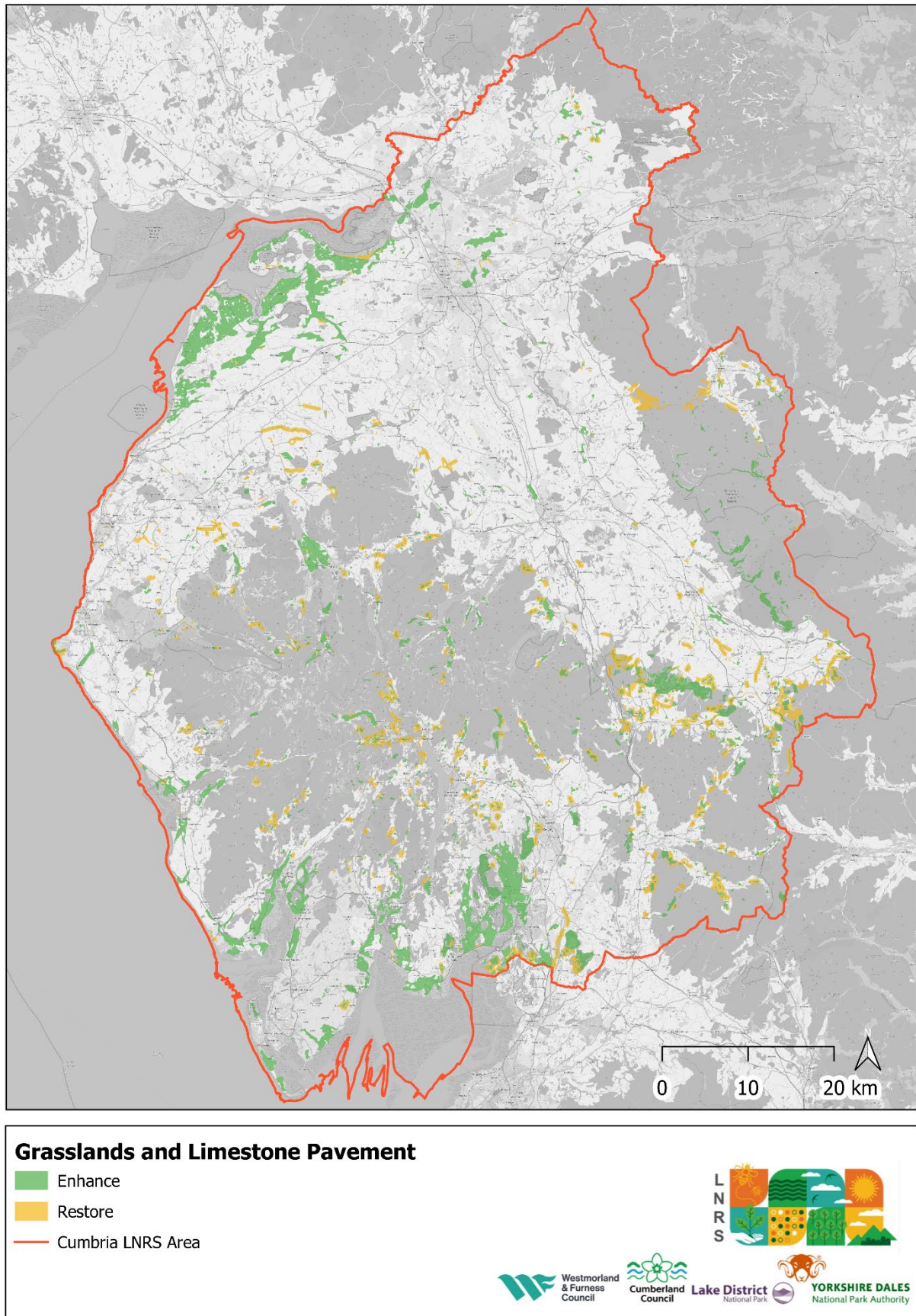
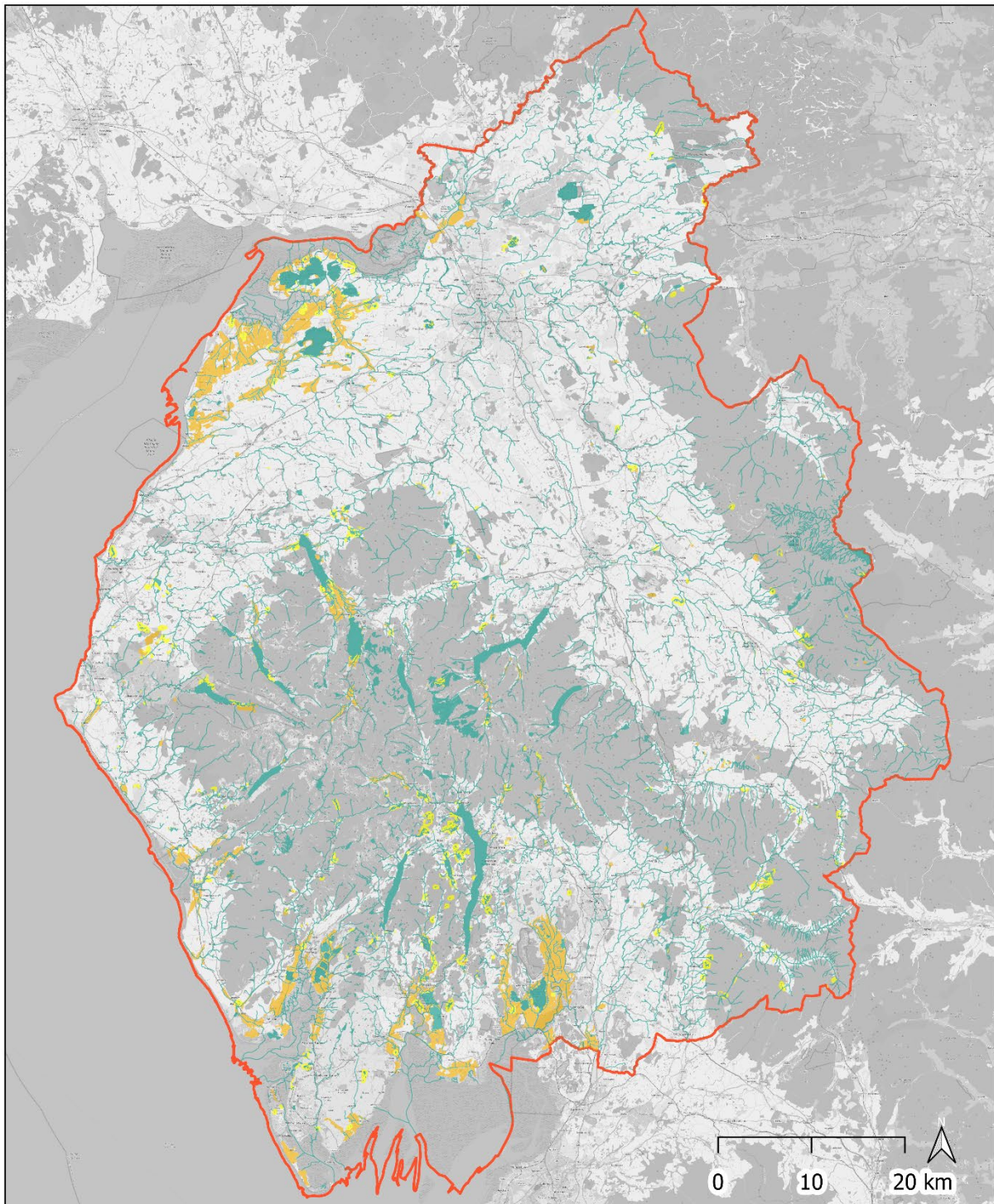






Figure 10: Local Nature Recovery Network for Grasslands and Limestone Pavement



Wetland and Freshwater

- Enhance
- Restore
- Create
- Cumbria LNRS Area


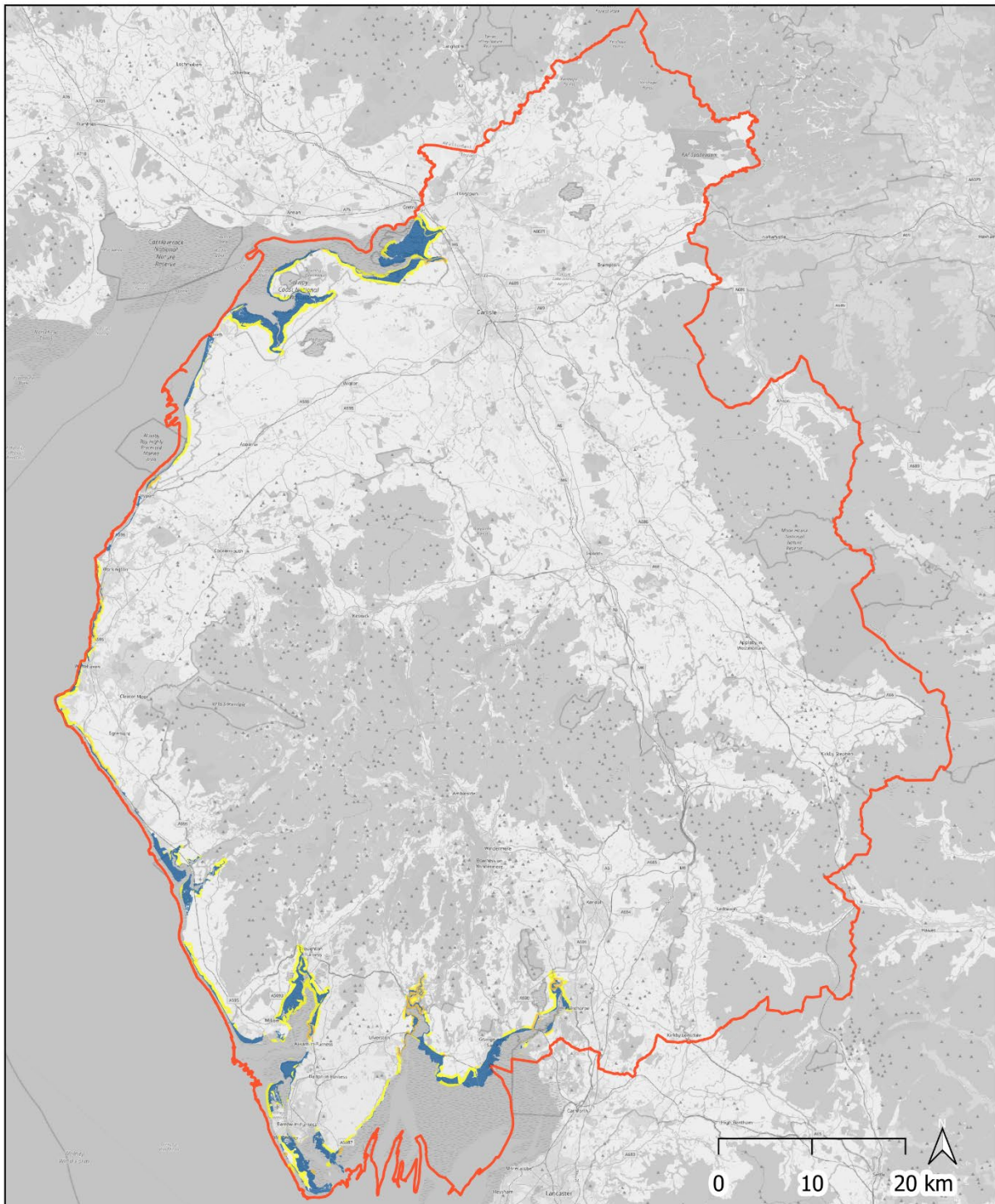


Figure 11: Local Nature Recovery Network for Wetland and Freshwater

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Coastal and Estuarine

- Enhance
- Restore
- Create
- No action
- Cumbria LNRS Area












Figure 12: Local Nature Recovery Network for Coastal and Estuarine