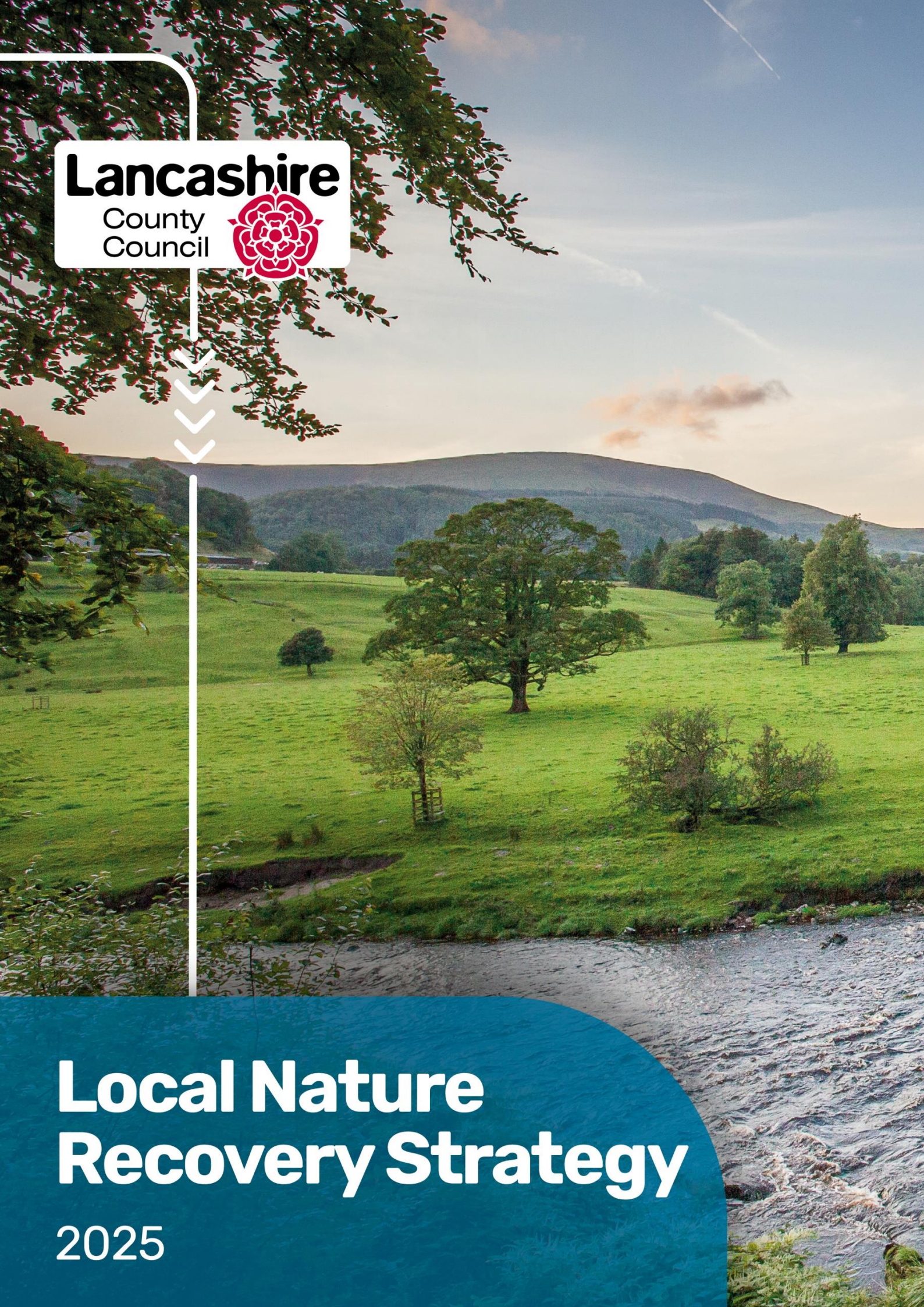

Local Nature Recovery Strategy

2025

Contents

Foreword

We are lucky in Lancashire to have a diverse and spectacular environment and landscape, stretching from the uplands to the coast, including areas designated for their national and international importance for biodiversity. However, reflecting global and national trends, Lancashire's biodiversity has been declining. We want to halt this decline and, in time, reverse biodiversity loss. We want to enhance and protect our best nature rich sites, create new sites where there is opportunity to do so, and provide better access to green and blue space that everyone can enjoy.

This is the first nature recovery strategy for Lancashire. It recognises the challenges we face in reversing this decline, but also the great opportunities we have for nature recovery and the benefits action can have, not only for our important landscapes, habitats and species, but for the people of Lancashire. Nature can provide many benefits, including greater public enjoyment and health benefits, carbon capture, water and air quality improvements and flood management. A more attractive place to work, visit and do business also encourages local economic growth.

I would like to thank everyone that has provided invaluable input and supported the County Council in preparing this Strategy for Lancashire, and I look forward to continuing this collaboration in delivering the priorities and opportunities we have collectively identified. By working together, we can build on the good track record we have in Lancashire on improving our environment and use this strategy as a foundation for further action.

Acknowledgements

This Strategy was written in collaboration with organisations and partnerships from across Lancashire, including:

Supporting Authorities:
- Blackburn with Darwen Borough Council
- Blackpool Council
- Burnley Borough Council
- Chorley Council
- Fylde Council
- Hyndburn Borough Council
- Lancaster City Council
- Pendle Borough Council
- Preston City Council
- Ribble Valley Borough Council
- Rossendale Borough Council
- South Ribble Borough Council
- West Lancashire Borough Council
- Wyre Council
- Yorkshire Dales National Park Authority
- Natural England

Consenting Authorities:
- Environment Agency
- Forestry Commission

Habitat Leads:
- Graeme Skelcher Ecology
- Greater Manchester & Lancashire Wildlife Trust
- Lancashire Peat Partnership
- Lancaster University
- Ribble Rivers Trust
- Suzanne Perry
- Wyre Rivers Trust

The local environmental records centre – LERN (Lancashire Environment Record Network).

Marine Management Organisation

Lancashire County Councill would like to thank all local authorities, organisations and individuals who have provided support, information, feedback, and input into the preparation of the strategy. A full list of those involved is included in the supporting *Evidence and Technical Information*[i] document.

Executive Summary

Local Nature Recovery Strategies (LNRS) were introduced by the Environment Act 2021 to drive nature's recovery and provide wider environmental improvements. Their main purpose is to identify locations to create or improve habitat most likely to provide the greatest benefit for nature and the wider environment. The LNRS is a tool to identify opportunities for nature recovery, which can be used to target action and funding, it is not intended to be a delivery plan.

Lancashire County Council has been appointed as the responsible authority for the preparation of the Lancashire LNRS, which includes Blackburn with Darwen and Blackpool. An inclusive and collaborative approach has been taken to co-produce the Strategy with a broad range of stakeholders.

The Strategy provides a collective vision for nature recovery to work together to protect, enhance and connect our rich biodiversity and natural environment to be enjoyed by more Lancashire residents and visitors.

It aims to:

- Halt local biodiversity loss and support thriving species populations, which can move more freely through the landscape.
- Conserve natural resources and build resilience to climate change.
- Provide wider benefits for the people of Lancashire including increased and equitable access to green and blue space.
- Reinvigorate existing partnerships and establish new ones to deliver nature recovery in the places and spaces that need it most on a landscape-scale.

The Strategy is made up of two main elements, a Statement of Biodiversity Priorities, and a Local Habitat Map.

The **Statement of Biodiversity Priorities,** includes a description of Lancashire and its biodiversity in terms of geomorphology, important habitats, and species, drawing together existing information on the state of nature and the environment in Lancashire. Lancashire's important habitats span the following broad habitat types:

- Aquatic & wetlands
- Coastal & estuarine
- Grasslands (including agricultural land)
- Lowland & upland peatland
- Rocky habitats
- Urban habitats (including infrastructure networks)
- Wooded habitats & trees

The existing and likely future pressures faced by each of these habitats have been identified, together with possible opportunities for nature recovery to overcome these pressures. These pressures and opportunities have informed the priorities (the long-term end results that the strategy is seeking to achieve) and the potential measures, or actions, that can be taken to contribute to achieving each agreed priority and deliver wider benefits such as climate resilience, flood risk management, more equitable access to green and blue space that is safe and sustainable, and improved health

outcomes. Measures include, for example, the enhancement, creation, expansion, connection and maintenance of Lancashire's important habitats as well as other actions to support nature's recovery.

Measures carried out on each specific habitat will also benefit a range of Lancashire's most important species. These have been identified alongside the habitat measures.

Twenty-four species have also been identified as 'target species'. These are some of Lancashire's most scarce, declining or most important species, requiring bespoke actions beyond the more general habitat creation and enhancement measures to enable their recovery. They are:

Mammals:

- Red squirrel

Fish:

- Atlantic salmon
- European smelt

Birds:

- Hen harrier
- Black-tailed godwit
- Black-headed gull
- Lesser black-backed gull

Plants:

- Yellow Star-of-Bethlehem
- Northern bedstraw
- Wood Crane's-bill
- Melancholy Thistle
- Lady's slipper orchid
- Petty whin
- Dwarf cornel

Invertebrates:

- Duke of Burgundy butterfly
- High brown fritillary butterfly
- Pearl-bordered fritillary butterfly
- Large heath butterfly
- Belted beauty moth
- Least minor moth
- Wall mason bee
- Tormentil Mining-bee
- Bilberry bumblebee
- Red wood ant

Additionally, three 'universal' priorities that relate to recurring pressures across all habitats have been identified as:

- Access to nature is provided whilst minimising recreational impacts on sensitive sites, habitats and species populations.
- Nutrient enrichment, sediment deposition and pollution are minimised.
- Biosecurity (measures aimed at preventing the introduction or spread of harmful organisms) and control of invasive species.

The measures that could be taken to address these have also been identified. These are unmapped measures i.e., potential actions that could be used widely across the

whole strategy area. Mapped measures are those opportunities which can be mapped to a particular area on the **Local Habitat Map** (see below).

Supporting actions that are not specifically linked to delivering actions 'on the ground' but are equally important in achieving the wider goals of nature recovery have been identified as:

- Data and evidence to inform nature recovery actions.
- Engagement & collaboration.
- Policies that support nature recovery.
- Funding and finance for nature recovery.

The **Local Habitat Map** identifies the existing Areas of Particular Importance for Biodiversity, this includes internationally, nationally, and locally designated sites, as well as Lancashire's statutory irreplaceable habitats. It also identifies the 'Areas that Could Become of Particular Importance' for biodiversity. These are the locations where creation or restoration of habitat could deliver the greatest gains in terms of nature's recovery, wider benefits for the environment and people, and the most investible opportunities for private investment in nature's recovery.

The map shows how existing habitats (our Areas of Particular Importance for Biodiversity) can be connected to create ecology networks enabling species to move between them and help nature thrive.

This LNRS will be the guiding strategy for nature recovery across Lancashire. It can be used by everyone, including local authorities, landowners, environmental organisations, businesses, community groups and residents to target action and inform future policies and plans.

1. Introduction

Lancashire is a diverse county with a rich history and culture. The contrasting geography of the area, along with the creativity and friendliness of its people, combines to make Lancashire a great place to live, learn and work. Lancashire is 'polycentric' with a strong network of urban centres set amongst areas of outstanding natural beauty.

There is great natural physical diversity from coast and estuary landscapes to uplands with extensive areas of open countryside and moorland. There is also a great variety in the focus and intensity of the management of land, including areas carefully managed for nature conservation aims, dense urban, commercial, and industrial landscapes.

"Despite being one of the most populous and urbanised shire counties in the UK, much of Lancashire is still predominantly rural. The coastal plain formerly had extensive raised mires (mosses), which have been converted into highly productive agricultural land, and uncultivated mossland only survives as remnants. Some of the vast numbers of wildfowl and wading birds, which feed and roost on the extensive estuaries also use these fields for feeding. Nationally important areas of coastal limestone pavement occur in the north of the county. Semi-natural grasslands are now very rare on the plain but, together with other traditional lowland farmscape elements, are important for farmland birds and plant species which are declining nationally. High field pond densities are locally very characteristic. In the east are two major semi-natural upland areas; of which the Forest of Bowland and outlying Pendle Hill is the most northerly. Heather moorland and blanket bog here are of international importance for breeding birds. The herb-rich hay meadows and clough woodlands are nationally important habitats, but semi-natural grasslands including marshy grasslands which support breeding waders continue to be lost to agricultural improvements. A similar range of habitats occurs in the West and South Pennines, shared with adjacent counties of Greater Manchester and West Yorkshire, and upland reservoirs here add habitat diversity. With the notable exception of the Arnside and Silverdale National Landscape, Lancashire's woodland cover is low[ii]."

Wild about the North West: A biodiversity audit of North West England

The landscape and environment in Lancashire today are the result of millennia of complex interactions between geology, topography, climate, and human activity. It is an ever-changing picture which is not (and cannot) be either static or unmanaged.

Lancashire residents recognise the importance of nature for the natural beauty and cultural heritage it provides and for the benefits it can bring for both physical and mental wellbeing, with many visiting a local park or nature reserve on a weekly basis. However, many are concerned about the state of nature and issues such as the loss of green space and pollution of rivers.

There is limited data on the state of Lancashire's nature, but from what is known, and using the knowledge of local experts, we know Lancashire is experiencing a decline in biodiversity, with key bird populations declining and bees experiencing a dramatic

decline, and woodland cover in Lancashire being below the NorthWest and national average. Lancashire's habitats and species are experiencing pressure from land-use changes, recreation, pollution, and the changing climate. However, there are great opportunities for nature recovery, building on work already being delivered by many organisations across Lancashire. For example, over £3.7m of peatland restoration projects have been delivered across Bowland since January 2022, over £1m has been secured for tree planting schemes being delivered by the Treescapes project and the strong Catchment Partnerships across Lancashire are delivering woodland creation and natural flood management schemes, being successful in securing external investment in these schemes. There are many local community engagement and volunteer groups across the county, enabling people to learn new skills and improve health and wellbeing by spending time in nature as well as making improvements to their local green space and making them more accessible for everyone.

The vision for nature recovery

This Local Nature Recovery Strategy sets out a long-term vision to work together to protect, enhance and connect our rich biodiversity and natural environment to be enjoyed by more Lancashire residents and visitors.

It aims to:

- Halt local biodiversity loss and support thriving species populations which can move more freely through the landscape.
- Conserve natural resources and build resilience to climate change.
- Provide wider benefits for the people of Lancashire including increased and equitable access to green and blue space.
- Reinvigorate existing partnerships and establish new ones to deliver nature recovery in the places and spaces that need it most on a landscape-scale.

This will be the guiding strategy for nature recovery across Lancashire. It can be used by everyone, including local authorities, landowners, environmental organisations, businesses, community groups and residents to target action and inform future policies and plans.

Why we need a Local Nature Recovery Strategy

England is widely considered to be one of the most nature-depleted countries in the world following historic and ongoing declines, resulting in the government making legally binding commitments to end these declines and for nature to recover.[iii] The 25 Year Environment Plan[iv] set out 10 long-term goals for action to help the natural world regain and retain good health. It introduced the concept of creating a "nature recovery network" to complement and connect our best wildlife sites and provide opportunities for species conservation and the reintroduction of native species. Such a network will deliver on the recommendations from Professor Sir John Lawton[v] that recovering wildlife will require more habitat; in better condition; in bigger patches that are more closely connected.

The Environment Act[vi] 2021 required the setting of a suite of legally binding targets, including a target to halt the decline in species abundance. This target is set out in the Environmental Improvement Plan 2023[vii], the first revision of the 25 Year Environment Plan, along with additional commitments related to nature. A list of relevant national targets and objectives agreed in the Plan is outlined at Appendix One. The Environment Act also introduced the requirement to prepare nature recovery strategies for areas in England to identify opportunities to create and restore habitat to help deliver these commitments. There are 48 local nature recovery strategies covering the whole of England with no gaps or overlaps. Together they will underpin the Nature Recovery Network.

The benefits of nature

Nature plays a vital role in supporting our wellbeing, society, and economy. It provides the air we breathe, the food we eat, the water we drink, and many of the resources crucial for our survival and quality of life. Nature also captures and stores carbon and has a vital role to play in helping us adapt to the impacts of climate change.[viii]

Environmental benefits

Habitats and the natural environment are responsible for dynamic systems and natural processes such as soil formation, the water cycle, the carbon cycle, supporting food production and climate regulation, which are all fundamental to sustaining life. These are functions that cannot be substituted with other solutions such as technology. They are irreplaceable.

A healthy water supply depends on natural habitats and processes for filtration, regulation of water flow and reducing sediment and pollution. Habitat creation and enhancement can also minimise erosion and support sustainable management of river catchments with increased resilience to floods and drought. Water supply, healthy soils, pollinators and the control of pests and diseases are fundamental for food production.

Habitats can store huge amounts of carbon in soil, sediment, and vegetation, helping to reduce carbon emissions. Conversely, degradation results in the release of emissions contributing to climate change. Through regulating water flows and temperature, providing flood protection, and reducing erosion the natural environment is important in helping to build resilience to the impacts of a changing climate.

Benefits to the economy
A healthy natural environment results in a more attractive area to live, work, visit and enjoy, which encourages local economic growth. The economy is reliant on natural resources for multiple purposes such as food production, raw materials for construction and industry, a healthy water supply and flood alleviation. This is known as 'natural capital' and is important to local and national economies, such as manufacturing, energy, farming, fishing, forestry, leisure, and tourism, all of which depend on local employment and skills and provide potential for the creation of new jobs in low carbon industries, land management and natural science.

Health and wellbeing benefits
Drinkable water, clean air, nutritious food, and a safe environment are all critical for physical and mental health. Risks to public health from air pollution can be reduced through tree planting and other habitat creation. Targeted planting can have further benefits on air quality through the formation of green barriers, and this can also help to control temperatures in urban areas. Experiences of nature-rich and quiet open spaces in urban and rural environments also have great benefits for both physical and mental health and wellbeing.

Social, cultural, and educational benefits
The natural environment has intrinsic value and importance to many people. Nature recovery action can enable active engagement with the natural world, whilst providing social and educational opportunities and benefits to wellbeing, through events, outdoor learning, and volunteer opportunities.

The State of Nature

Globally, it is estimated that over 1 million species are threatened with extinction and that the populations of many vertebrate animals have declined by at least two-thirds since 1970[ix]. The UK has experienced a significant loss of biodiversity, with declines over the last 50 years following on from major changes to the UK's nature over previous centuries. As a result, the UK is now one of the most nature-depleted countries[x], the State of Nature Report in England highlights:

- Intensive management of agricultural land since World War II has historically led to significant loss and fragmentation of semi-natural habitats.
- The abundance of terrestrial and freshwater species has on average fallen by 32% across England since 1970.
- The distributions of 4,815 invertebrate species on average decreased by 18% since 1970.
- Since 1970, the distributions of 64% of flowering plant species and 68% of bryophytes (mosses and liverworts) have decreased.
- Of 8,840 species that have been assessed using IUCN Regional Red List criteria[xi], 13% have been classified as threatened with extinction from Great Britain.

There is little data available on biodiversity trends for Lancashire, and the absence of sufficient data prevents robust statistical analysis. Survey and research targeted through the LNRS will therefore be essential to aid understanding and ultimately the recovery of Lancashire's habitats and species. The information available indicates:

- Total tree and woodland cover is approximately 10.34% (2022 National Forest Inventory figures), this is below the North West average for woodland cover (12.57%) and the England average (14.87%).

- Coastal squeeze of inter-tidal habitats is increasing pressure on biodiversity in the important coastal habitats of Lancashire.

- Bird populations can be used as an indicator of the wider state of nature. Mirroring national trends there have been declines in Lancashire's bird species. The data between 1999 and 2011 shows:
    - Important woodland species pied flycatcher and willow tit declining by 10% and 50% respectively with willow tit further declining by 14% between 2011 and 2020.
    - Three key moorland species are in serious decline with ring ouzel declining by 29%, whinchat by 55% and twite by 85% (possibly functionally extinct).
    - Among aquatic and wetland species, breeding curlew, lapwing and snipe are all declining (curlew unknown, lapwing by 7% and snipe by 23%).
    - Among Coastal & Estuarine species, redshank has declined by 22% and ringed plover by 28%.
    - Of grassland and farmland birds, corn crake is functionally extinct but could be considered for reintroduction in future strategies. Grey partridge, yellow wagtail and corn bunting are all in decline (by 37%, 37% and 18% respectively).
    - Among urban species, greenfinch appear to remain stable after recent declines, however others are sadly in decline with starling declining by 1% (after a much larger decline), swallow by 5%, house martins by 20% and swifts by 35%.
- Key invertebrate groups also show a pattern of decline in most species. Bees have experienced the most dramatic decline.

- We have very little information on mammal trends for Lancashire, but it is believed many follow the national trends showing a long-term decline. Some species like water vole which historically supported much greater populations in Lancashire have severely declined with only small remnant populations remaining.

- The Ribble Rivers Trust utilise a catchment scale fisheries monitoring programme, focused on salmonids (Trout and Salmon) to provide an indication of catchment health, which allows identification of locations in poor condition requiring further investigation and action to make improvements. This data has shown a concerning decline in populations of both salmon and trout across the catchment. Although salmon populations are significantly dependent on marine conditions, trout are less so and show the same trajectory. Historically eel populations were well supported in Lancashire but only small remnant populations now remain.

Causes of biodiversity decline

Evidence from the last 50 years shows that on land and in freshwater,xii climate change and land management intensification have had the greatest impacts on our wildlife. Historic pressures on habitats and biodiversity have been linked to increased consumption, reduced resource efficiencyxiii, and changes to land use and human activity. Many habitats have become fragmented or lost as a result. Absent management is an ongoing pressure on remaining habitat fragments, which may be too small to be managed effectively, particularly species-rich grasslands and wetlandsxiv. However, many land managers are working hard together with ecologists and conservationist to reverse these trends.

The government's Environmental Improvement Plan acknowledges the significance of climate change as a pressure on nature. It recognises that we will see more intense and changeable weather and coastal erosion; an increase in risks from pests, pathogens, and invasive species; and knock-on impacts to our ecosystems, habitats, species and agricultural, forestry and marine productivity.

Nature Recovery

Ecological networks have become widely recognised as an effective way to conserve wildlife in environments that have become fragmented by human activities. An ecological network comprises a suite of high-quality sites which collectively contain the diversity and area of habitats needed to support species and which have ecological connections between them enabling species to move between them. The LNRS identifies where the greatest connectivity between similar biodiverse habitats across the landscape can be achieved.

What is a Local Nature Recovery Strategy?

A local nature recovery strategy (LNRS) is a locally led collaborative strategy identifying priorities agreed between a wide group of stakeholders to drive nature's recovery and in doing so provide wider environmental and co-benefits, such as public access to nature, natural flood-risk management, and resilience to climate change.

The main purpose of the LNRS is to identify locations to create or improve habitat most likely to provide the greatest benefit for nature and the wider environment. These mapped opportunity areas are intended to guide where the public, private and voluntary sectors can focus their nature recovery efforts to enable the best, most joined-up actions to help improve connectivity and resilience for habitats and species across the strategy area.

The LNRS is a tool to identify opportunities for nature recovery, which can be used to target action and funding. It is not intended to be a delivery plan. Landowners of the areas mapped are not obliged to deliver the opportunities identified. They are simply opportunities within areas that could deliver the greatest gains in terms of nature's recovery, wider benefits for the environment and people, and the most investible opportunities for private investment in nature's recovery.

The LNRS does not add levels of designation to land and therefore does not assign any level of protection or restrictions on land use. It also does not give permission to create habitat without necessary consultation and consents or without following appropriate existing statutory requirements, decision-making frameworks, and pre-existing procedures.

What is in the Local Nature Recovery Strategy?

The Nature Recovery Strategy is made up of two main elements, a statement of biodiversity priorities and a local habitat map, that come together to set out how and where action can be taken to provide the greatest benefits for nature recovery.

The statement of biodiversity priorities draws on existing information on the state of nature and the environment to describe Lancashire and its biodiversity and identify existing areas of particular importance, including internationally designated sites and those designated locally as important for Lancashire.

The existing and likely future pressures on nature such as pollution, climate change, development and other land-use change, and the possible opportunities for nature recovery and enhancement to overcome those pressures are identified. These pressures and opportunities have informed the development of the Strategy priorities and measures for both habitats and species.

Priorities: These are the long-term end results that the strategy is seeking to achieve in terms of habitats and species. The priorities for Lancashire reflect local circumstances, including the most important issues to local people and organisations.

Potential Measures: These are the practical actions that could contribute to achieving each agreed priority and can deliver wider gains for the environment and people of Lancashire.

The Local Habitat Map provides a clear visual way to see the areas which already are, and those that could become, of particular importance. Areas that could become of particular importance have been targeted to join up or expand existing areas of particular importance for biodiversity. This is intended to establish larger, more resilient networks of high-quality habitat across the landscape, and show how spaces can be better connected across Lancashire.

How the strategy was developed

As the designated responsible authority, Lancashire County Council has led on the production of this LNRS. However, an inclusive and collaborative approach has been taken to co-produce the Strategy with a broad range of stakeholders. This includes all local authorities in the strategy area, public bodies (Environment Agency, Forestry Commission and Natural England), habitat and species experts from local environmental organisations and Lancaster University. Land managers (farmers, local authorities, education providers, the NHS, and utilities companies) and members of the public have shared their knowledge, experience and understanding of where nature recovery should be focused, and this information has fed into the production of the LNRS. The Strategy has been developed following the statutory and non-statutory guidance provided by DEFRA and Natural England, taking an evidence-based and locally led approach incorporating data, local expertise, and local opinion.

In preparing this strategy we have:

- Established a Steering Group to provide oversight and direction.
- Delivered a stakeholder mapping workshop to identify key organisations to be involved at various stages of the process.
- Established a mapping, data, and evidence group to develop ecological network models and lead on data management.
- Carried out an online public engagement survey, including an interactive publicly accessible online map, to gather opinion and opportunities for nature recovery across the strategy area.
- Appointed specialist facilitators to engage with landowners, land managers, farmers, and representatives from the sector through workshops, webinars, drop-ins at auction marts and attending existing farmer groups.
- Supported by Natural England, held four 'People and Nature' workshops to engage with the Voluntary Community Faith and Social Enterprise (VCFSE) sector.
- Reviewed over 190 national, regional, and local strategic plans, and documents to identify common pressures, themes, priorities, and measures.
- Commissioned local environmental organisations to lead on each of the habitat groups and facilitate input from key interested organisations. They helped to describe the strategy area, its biodiversity and identify the pressures and opportunities for recovery in relation to their habitat to inform the development of priorities and measures.
- Engaged species experts to identify Lancashire's most scarce, declining or most important species requiring bespoke actions beyond the more general habitat creation and enhancement measures.

A timeline of the key milestones is provided in Figure 1. Further details on the LNRS development process, and sources of information and data used to inform the strategy are included in the supplementary *Evidence and Technical Information* document[1].

[1] *Lancashire LNRS Evidence and Technical Information Document.*

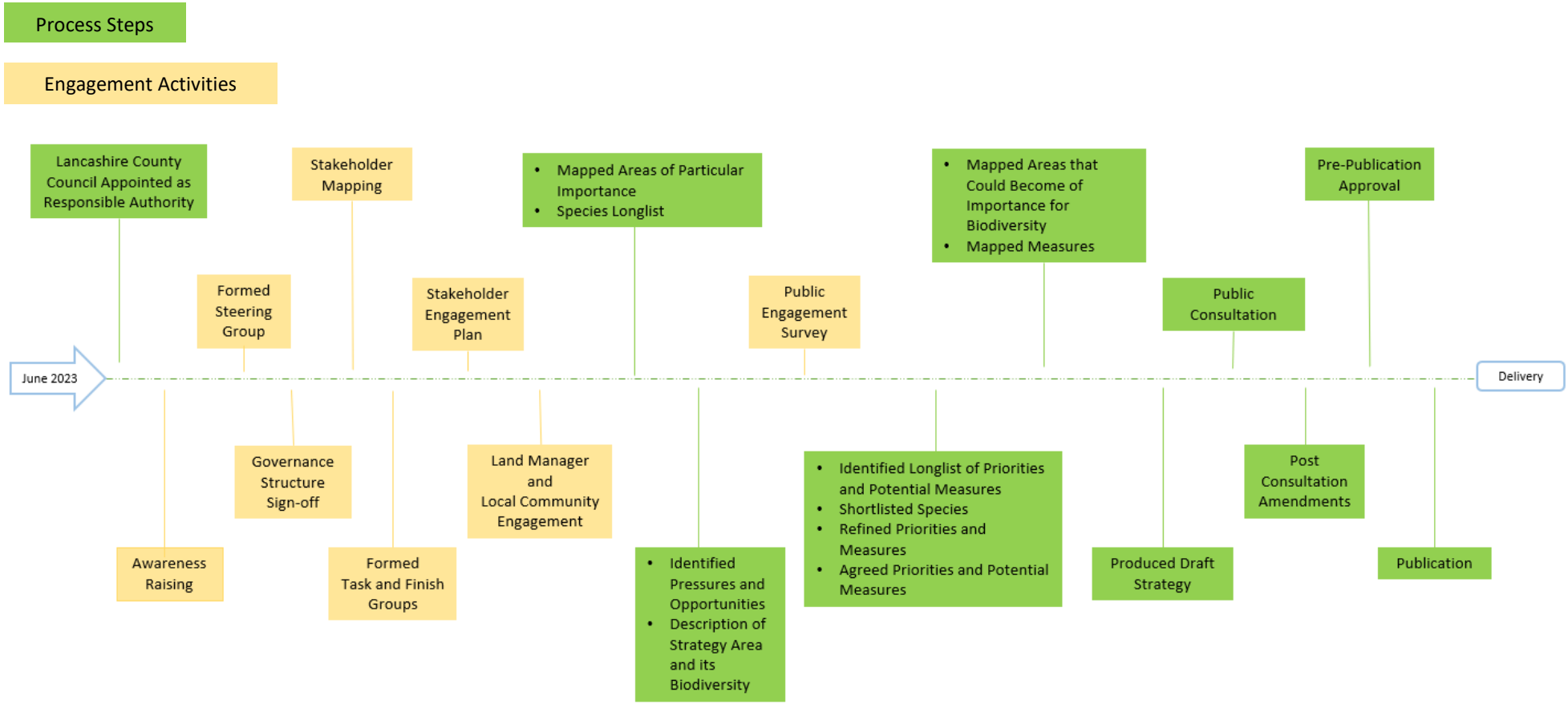

Figure 1: LNRS Development Timeline and key milestones

Who the LNRS is for and how to use it

The LNRS is for the nature and people of Lancashire. Whether you are a land manager, developer, planner, environmental organisation, member of a community group or resident, everyone can act for nature.

The LNRS is not a delivery plan but can be used to understand how and where action could be taken to help nature recover. It identifies the opportunities for nature recovery action in locations likely to provide the greatest benefit. It does not impose requirements for land use change, establish statutory designations or place restrictions on land use. All projects delivered to meet LNRS priorities must still comply with relevant legislation, policy, and best practice standards, a summary of some key considerations is provided in Appendix Two.

The Strategy can be used to:

Inform and evidence:

- Policies, plans, and land-use change decisions.
- Land management options, advice, and decisions.
- Appropriate nature recovery opportunities locally and on a landscape scale.
- Understanding of the state of Lancashire's nature and where there is a need for improved information and data.

Target action:

- in the places where it is most likely to have the greatest benefit to species and habitats.
- to take a strategic approach to species recovery, including target species prioritised for bespoke conservation measures.

Deliver multiple benefits:

- Identifies where actions can have multiple benefits, such as reduced flood risk, climate resilience, equitable access to nature, and improved health outcomes.
- Encourage greater involvement in nature recovery by everyone and promote a collaborative approach.

Direct funding & investment:

- Helps to target and prioritise nature recovery funding and investment.
- Identifies strategically significant locations for delivery of biodiversity net gain.
- Provides evidence and support for funding applications.

Monitor:

- Provides a strategic framework for monitoring biodiversity change.

Different organisations and groups of people will be able to use the LNRS in different ways:

Local authorities and public bodies: Section 40 of The Natural Environment & Rural Communities (NERC) Act 2006 (duty to conserve biodiversity)[xv] addresses the duties

of public authorities in relation to local nature recovery strategies. Public authorities are required to consider what they can do to conserve and enhance biodiversity and then take action as they consider appropriate. In meeting this requirement, they must have regard to any relevant local nature recovery strategy.

Section 98 of the Levelling-up and Regeneration Act 2023[xvi] requires the Contents of a neighbourhood development plan to take account of any local nature recovery strategy that relates to the neighbourhood area.

The LNRS can support with informing policy, targeting action and provide assurance that biodiversity improvements and nature recovery projects are being targeted in the best locations to achieve the greatest benefit.

Land managers and landowners: Landowners and land managers are integral to supporting nature and achieving better outcomes for biodiversity. The Local Habitat Map shows where the best opportunities to do something significant for nature recovery are located and what the likely best actions could be. Management for nature recovery may provide opportunities for funding, such as through agri-environmental schemes or Biodiversity Net Gain. The Local Habitat Map also highlights where there are nearby opportunities and where potential landowner clusters could be formed to collaborate on nature recovery initiatives.

Developers: The local habitat map identifies opportunities for developers to deliver mandatory biodiversity net gain (BNG). Development projects that create, enhance, or recover habitat in locations which are mapped in a local nature recovery strategy will get a higher biodiversity value in the biodiversity metric than they would in other locations.

Environmental organisations: Local environmental organisations are already delivering nature recovery projects across Lancashire and will be important in achieving the strategy priorities. The LNRS provides an opportunity to align approaches and work towards an agreed set of shared goals. The Local Habitat Map shows where the best opportunities to do something significant for nature recovery are located and will help to identify where efforts and funding could be targeted for the greatest benefit.

Businesses: All businesses and organisations can take action to embed nature-friendly practices into their operations and corporate plans and invest in nature's recovery. The Local Habitat Map can help businesses to understand how their activities fit within the local environment and could identify opportunities for collaboration, staff volunteering schemes or opportunities to support a local community group deliver nature recovery initiatives.

Community groups: There are many active community groups tending local sites across Lancashire. The LNRS can help to identify where the best opportunities for nature recovery are, provide direction on what action to take, and support funding applications. It will also help groups understand how local project support wider nature recovery.

Residents: Residents can use the LNRS to find out what they can do to support nature recovery. Private gardens, yards, balconies and communal spaces are particularly important for habitat connectivity, helping species move between areas.

What matters to you?

In March 2024 an online public engagement survey sought residents' views on nature recovery to better understand what is important to our residents with regards to the natural environment, concerns for nature and aspirations for nature recovery. 963 people responded. You told us:

- The main reasons nature is important is for natural beauty/cultural heritage and improvement of mental and physical health.
- Almost half of respondents are concerned about the state of nature in Lancashire. 55% believe that nature in Lancashire is in at least a 'good' state.
- Hedgehogs, Bees and Red Squirrels were the top species identified for nature recovery action.
- Almost 50% of respondents spend time in nature in their own garden daily, 21.4% visit their local park at least once a week with 17.5% visiting a nature reserve / conservation area weekly. However, only 30% strongly agreed that nature is of a high enough standard to want to spend time in.
- Barriers to accessing nature include safety, poor public transport, loss of nature to development, landowner restrictions and bad weather.
- The most important environmental issue of concern was, *'building on green and natural spaces'*, closely followed by *'pollution of rivers, lakes and groundwater'*.

Less than 5% of respondents to the survey were under 30 years old. To further engage with this age group, students at Myerscough College and at the Lancashire Youth Climate Conference 2024 at Blackpool Sixth Form were asked what issues were important to them. They highlighted:

- How nature connects people to places
- Conserving green spaces and nature reserves
- Clean beaches
- Good water quality on the coast

Information gathered from the public engagement survey formed part of the data used to inform the shortlisting of priorities and measures.

Landowners and managers

Independent facilitators experienced in working with farmers and land managers organised several workshops, webinars and drop in events to raise awareness of the LNRS and seek views and feedback that would help shape the priorities for Lancashire.

Participants from this sector displayed a clear pride in, and knowledge of, the wildlife on their land. This results in many taking action to support nature and biodiversity on their land and outside of any support or funding structures, and many examples of this were given. Key themes and opportunities that came out of this engagement were:

- The need for one-to-one advice
- The need for a single, trusted platform for information
- The need for education, training, and upskilling
- More and accessible baseline data
- The LNRS providing an opportunity for joined up thinking.

Some of the barriers and opportunities for nature friendly land management practices were identified as human impacts, accessibility of grants and agri-environment schemes, the pressures on farmers and land managers and in particular education; and the importance of educating children at an early age. The insight and feedback gathered[xvii] particularly around the enablers and barriers to nature friendly farming and land management practices has informed the potential measures and supporting actions.

Voluntary, Community, Faith, and Social Enterprise (VCFSE) Sector

Four 'People and Nature' workshops targeted at those working in health and education, the VCFSE sector and local community groups working on projects to achieve multiple outcomes for people and nature. Areas of good practice and opportunities for nature as well as what could be done better were considered. They identified:

- The creation of high tide roosts for birds and the need for wetland restoration.
- The creation of wildflower meadows in parks and cemeteries and along road verges.
- The control and removal of invasive species.
- Water quality improvements.
- Species recovery.
- Supporting tree planting and peatland restoration projects.
- Numerous urban based projects including 'Green Social Prescribing' (nature-based activities to improve mental and physical health), 'growing' projects and nature-based regeneration and green infrastructure.

The pressure from development was a concern highlighted by all groups; as well as the need for training, pooling of resources and better knowledge sharing through resource hubs. These key findings have been reflected in the potential measures and supporting actions identified.

2. Statement of Biodiversity Priorities for Lancashire

Description of Lancashire and its biodiversity

The area covered by the strategy includes Lancashire's twelve districts, Blackburn with Darwen and Blackpool, covering an area of 3,066 square kilometres, with a population of 1.53 million. The Lancashire LNRS also includes a small part of the Yorkshire Dales National Park.

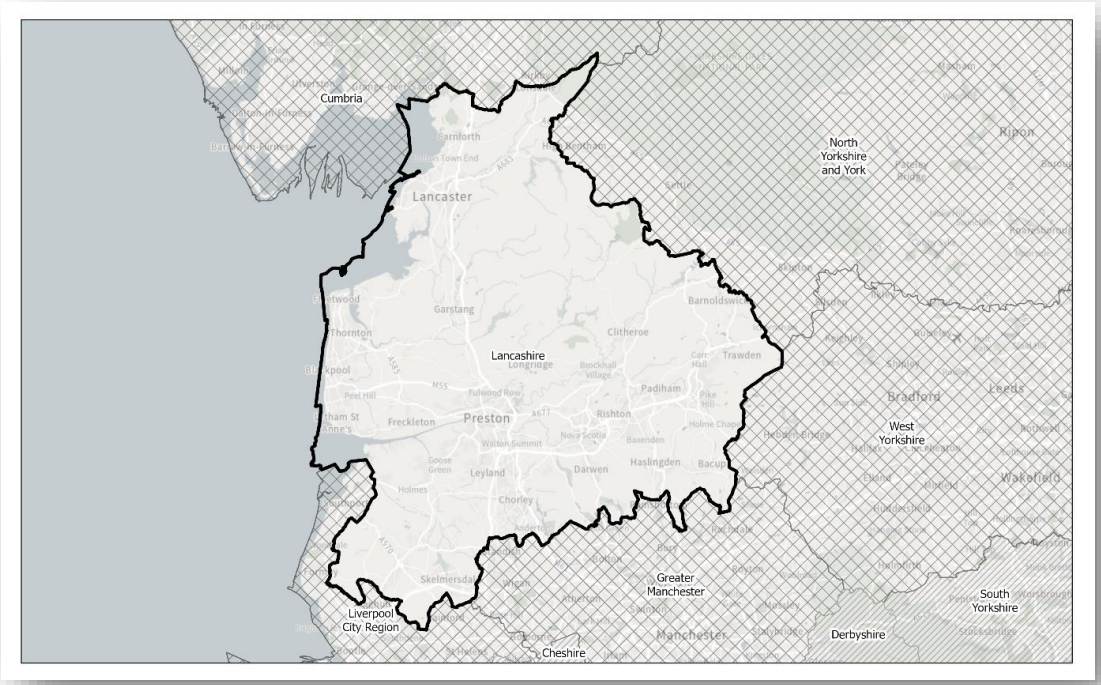

Figure 2: Boundary of the strategy area

Lancashire is 'polycentric' with a strong network of urban centres set amongst areas of outstanding natural beauty. There is great natural physical diversity from coast and estuary landscapes to uplands with extensive areas of open countryside and moorland, as well as dense urban, commercial, and industrial areas. Natural England's National Character Area (NCA) profiles[xviii], together with a range of other local information have been used to provide summary descriptions of Lancashire's varied natural environment and biodiversity. Lancashire is divided into 11 National Character Areas, each representing a distinctly different landscape and following natural lines in the landscape not county or district boundaries.

- Morecambe Bay Limestones
- Morecambe Coast and Lune Estuary
- Bowland Fells
- Lancashire and Amounderness Plain
- Lancashire Valleys
- Bowland Fringe and Pendle Hill
- Southern Pennines
- Lancashire Coal Measures
- Manchester Pennine Fringe
- Sefton Coast
- Yorkshire Dales

Morecambe Bay Limestones

This area is found entirely within the district of Lancaster. It is a lowland landscape that surrounds the head of Morecambe Bay, consisting of conspicuous limestone hills with prominent scars, cliffs, screes, and exposed limestone pavements separated by areas of low-lying undulating farmland with limestone drystone walls, and wetland habitats including reedbeds, mudflats, coastal marsh and saltwater lagoons (in particular Leighton Moss). There are significant areas of limestone pavement, often forming a mosaic with other habitats. Lancashire and Cumbria are nationally recognised for the rare and unique wooded limestone hills and the limestone pavements of Arnside and Silverdale National Landscape. Some limestone pavements are heavily damaged with many covered by scrub or woodland. There are also several small caves, limestone outcrops and active and former quarries together with open mosaic habitats on previously developed land. The underlying limestone blocks form an arc rising steeply from the estuarine landscape at the head of Morecambe Bay with its extensive intertidal flats and salt marshes.

The retreat of glaciers from the last ice age to the north in Cumbria left several shallow river valleys including the Crake, the Lyth, Bela and Keer whose rivers join the channels of the main rivers, the Leven, and the Kent, as they enter Morecambe Bay and discharge through a vast dynamic estuarine network.

Leighton Moss SPA, Ramsar and SSSI, situated between Warton Crag and Silverdale on the edge of Morecambe Bay, is a site of outstanding importance for birds and wetland habitats. It contains the largest reedbed in north-west England, areas of open water and willow/alder scrub and mixed fen vegetation, supporting nationally important breeding populations of bittern, and bearded tit. A large population of reed warbler (one of the most northerly colonies in Britain), as well as sedge and grasshopper warblers, water rail, spotted crake and a wide range of waterfowl also breed there. The site also supports a variety of passage and wintering waterfowl and other birds, including nationally important numbers of teal, shoveler and gadwall. The site is also of value for other fauna including otters and a wide range of butterflies.

There are a number of important grasslands found in this area. Lowland calcareous grasslands are most extensive in the Arnside & Silverdale National Landscape and are present on the surface of the underlying limestone bedrock often occurring in intimate mosaics with woodland and limestone pavement habitats. Examples of high-quality calcareous grassland can be found within the Sites of Special Scientific Interest (SSSIs) at Gait Barrows, Warton Crag, Hawes Water, Thrang End and Yealand Hall Allotment, Jack Scout, and Silverdale Golf Course. The international value of the best of these sites has been recognised through designation as part of a suite of smaller sites that comprise the Morecambe Bay Limestones Special Area for Conservation (SAC). Semi-natural species-rich grasslands occur here on the deeper, neutral soils in mosaic with calcareous grasslands on thinner soils.

Important locations for waxcap grasslands in Lancashire include the area of Arnside & Silverdale National Landscape where over 20 species have been recorded. Two sites in Lancashire, Jack Scout, and the Post Office Lots, meet the threshold for SSSI qualification though neither site has been recognised for this interest feature.

Woodland habitats cover 15% of the area. This includes important upland deciduous ash woodlands and coniferous yew woodlands, for which the Morecambe Bay limestones are a stronghold. However, many have been affected by ash dieback, so these woodlands are at risk. Much of the landscape that has been reclaimed for agriculture and is otherwise virtually treeless aside from hedgerows alongside ditches on field margins.

Scrub forms part of this landscape including species-rich scrub in high quality semi-natural habitats of national and international importance. There are also orchards that contribute to food provision, genetic diversity, pollination, and biodiversity. The Arnside and Silverdale National Landscape is part of the Lake District Important Invertebrate Area, a significant place for the conservation of invertebrates and the habitats upon which they rely.

Morecambe Coast and Lune Estuary

Morecambe Coast and Lune Estuary is a relatively small and low-lying NCA bordering Morecambe Bay with a bedrock of sandstones and mudstones of Carboniferous, Permian, and Triassic age, but with a surface mainly shaped by superficial deposits of glacial, fluvial, and coastal origin. There are highly populated areas in the towns of Heysham and Morecambe and the City of Lancaster, but the NCA also encompasses areas of high tranquillity, particularly around the Lune Estuary and westwards along the Pilling Coast. There is a longstanding cultural link to the coastal environment through fisheries, trade, and tourism.

The area is crossed by the rivers Lune and Cocker, both of which enter the NCA from the Bowland Fringe. The rivers that empty into the bay also provide a strong physical connection between the area and the upland NCAs that frame it, particularly through the Lune Catchment, which drains a number of external NCAs including Cumbria High Fells, Howgill Fells and Yorkshire Dales as well as Bowland Fells.

The identity is strongly linked to the coastal environment along its margin with Morecambe Bay, and inland through the estuaries of the rivers Lune and Keer. These are nationally and internationally designated as SSSIs, SAC, SPA and Ramsar sites for their coastal habitats and the wildlife that they support. These include salt marshes, intertidal reefs, and wader and waterfowl populations.

Coastal and floodplain grazing marsh are associated with the estuaries of the Rivers Lune and Wyre, recognised for their internationally important wildfowl (for example, northern pintail) and wader populations (for example, redshank, ruff and ringed plover) through the Morecambe Bay & Duddon Estuary SPA designation. The proximity of the coastal grazing marshes to these outstanding wildfowl sites is important, as birds regularly commute between the grazing marshes and the mudflats and saltmarshes of the estuaries to forage and roost; the coastal and floodplain grazing marshes are therefore recognised as functionally linked land around the Morecambe Bay & Duddon Estuary SPA.

Away from the coast and urban areas, the landscape is mainly one of pastoral agriculture, including dairy, which varies in character from reclaimed grasslands bounded by wet ditches in the lowest-lying areas to a hedged landscape including frequent boundary trees as the land begins to rise in elevation. Stone walls become

prevalent near the adjacent upland NCAs, and where drumlins are present. Very small areas of lowland calcareous grasslands are found here, on old industrial or previously quarried sites.

Bowland Fells

The Bowland Fells form a distinctive upland block on the boundary between north Lancashire and the Yorkshire Dales. Upland areas of Lancaster, Ribble Valley and Wyre districts reside within its boundary. The landscape is wild and windswept, with upland oakwood on the steep slopes and cloughs, steep escarpments, upland meadows and pasture and expansive open moorland.

The NCA is within the Forest of Bowland National Landscape and contains areas of moorland, designated as a SPA due to its international importance for breeding hen harrier, merlin, and lesser black-backed gull. It also provides habitat for other important raptor species, peregrine falcon, and short-eared owl (features of the SSSI), and two breeding bird assemblages (also features of the SSSI) including songbird species such as ring ouzel and whinchat and wader species including curlew, lapwing, snipe and oystercatcher.

An assemblage of interesting and rare plant species is also a feature of the SSSI, some associated with woodland for example, chickweed wintergreen, some with the Millstone Grit crags such as hayscented buckler-fern and some found in flushes and springs such as broad-leaved cotton grass.

The peat soils of the fells, including the deep columns of peat associated with blanket bog, store significant volumes of carbon and are recognised for their importance through their designation as the Bowland Fells SSSI. Blanket bog habitat is also important for water storage with important peat forming *Sphagnum* mosses acting as sponges and growing in hummocks around dwarf shrubs such as heather and bilberry creating an uneven surface of tall vegetation and hollows essential for keeping water on the tops of the fells. The drainage pattern of this area has cut deep cloughs through the harder sandstone in a radial pattern emanating from the upland moorland plateau.

The remaining uplands are soils from the Belmont series and are typically acid, coarse and loamy. However, there are tracts of underlying limestone that buffer many of the water courses from the acidity. This land has traditionally been converted, by drainage, fertiliser, and lime application to improved pastures for grazing.

Upland oakwood is also a feature of the Bowland Fells SSSI, it is now fragmented, occurring on the steep slopes and in the cloughs, adding to the diversity of habitats within the site but only a remnant of the previous woodland. Many of the trees are of great age, supporting a variety of lichens, and the shelter they provide allows the growth of carpets of tall ferns. Temperate rainforest or acid oakwood (described by the Joint Nature Conservation Committee as old sessile oak woods with Holly and Hard Fern) is a habitat of European importance, with the best examples designated as Special Areas for Conservation (SAC). The British Isles once supported large expanses of temperate rainforest across its western fringes including South and West Pennines and the Forest of Bowland, the vast majority of which have been replaced by coniferous plantations and sheep grazed pastures. Temperate rainforest also forms part of the natural range of mammals such as pine marten and red squirrel (now mostly

restricted from the area) and provides habitat for migrant birds such as pied flycatcher[xix].

The area provides water catchments for many of the surrounding rivers in the adjacent Bowland Fringe and Pendle Hill NCA and beyond. There are also a large number of important waterbodies such as Stocks reservoir and several upland reservoirs at Barnacre, Barn Fold and Longridge also important for species such as birds, otter and invertebrates such as stoneflies and mayflies as well as providing water for public consumption within the towns of Blackburn, Burnley and Lancaster.

The northern slopes of the Fells are drained by streams that flow to the rivers Wenning and Hyndburn, tributaries of the Lune, which flows through Lancaster before entering the sea at Morecambe Bay. The western and south-western slopes are drained by the headwaters of the River Wyre and its tributaries, the rivers Calder and Brock, as well as the River Conder, which flows directly to the Irish Sea. The River Wyre enters the sea at Fleetwood. The southern and eastern slopes are drained by streams flowing to the River Ribble and by the headwaters of its tributary, the River Hodder. The Ribble flows through Preston before entering the Irish Sea at Lytham St Anne's.

High-quality species-rich meadows can be found in the limestone areas to the east. Lowland calcareous grasslands are found on old industrial or quarried sites, much the same as in Morecambe Coast and Lune Estuary. In Bowland however, calcareous grassland can sometimes be found above 250m, and similar in composition to the nearby lowland grasslands rather than a distinct upland calcareous grassland vegetation. A few upland hay meadows (nationally scarce flower-rich grasslands rich with eyebrights, pignut and yellow rattle) are found around the margins of the Bowland Fells and small pockets of Lancashire's semi-natural species-rich grasslands persist despite wide-spread agricultural improvements.

Species-rich purple moor-grass and rush pasture are found very patchily within the Bowland Fells. This is one of a few important locations for upland acid grasslands in Lancashire found mostly above 250m or 300m on acid rocks, sands and gravels. Waxcap grasslands are also present with ongoing research suggesting that grassland fungi are likely to be more widespread and diverse and potentially nationally important in Lancashire than is currently recognised.

The Fells are fringed by extensive areas of piecemeal ancient pre-1600 farm enclosures with irregular small to medium sized field parcels defined by a mixture of drystone walls, banks, hedgerows and fragments of ancient woodland. Extensive conifer plantations occur to the south-east and east of the area, with fragmented broadleaved woodland largely in the cloughs. Gisburn Forest adjacent to Stocks Reservoir, which is important for wintering wildfowl and breeding birds such as red breasted merganser, black-headed gull and ringed plover, is one of the largest examples of its kind in Lancashire. It also supports small but locally important populations of crossbill, black grouse, nightjar and goshawk. There are approximately 2,902ha of woodlands in the Lancashire area of the NCA (9% of the total area of the NCA in Lancashire), of which 415ha is ancient woodland, of which 27ha is plantation on ancient woodland sites.

Lancashire and Amounderness Plain

Lancashire and Amounderness Plain is an area of high-grade agricultural land, bounded by Morecambe Bay in the north and Liverpool City Region to the south. The most populated urban areas include Blackpool, Fleetwood, Leyland, Lytham St. Annes, Preston, Ormskirk and Skelmersdale.

The eastern boundary of the NCA is contained by the Bowland Fringe. The plain is made up of a series of low-lying landscape types: in the east, undulating lowland farmland on the highly productive coastal plain, and in the west, the former moss lands and their remnant sites, and the coastal marshes and dunes. The Ribble Estuary and coastline include intertidal sand flats and mudflats, backed by remnant dunes and some of the largest salt marshes in the county. About 90 % of Lancashire's sand dunes are in the Fylde district. Place names incorporating ‘moss’ and ‘mere’ are numerous today and are associated with an abundance of maintained ditches and drains.

The northern Fylde (or Amounderness) coastal plain contains the estuary and lower reaches of the River Wyre, as well as its tributaries, the rivers Calder and Brock. It is predominantly improved pasture, with isolated arable fields. It is an ordered landscape of medium-sized fields with field ponds, clipped hedgerows and drainage ditches with areas of stubble and grass leys that contribute to significant feeding grounds for internationally important flocks of pink-footed goose and whooper swan. This is a medium to large-scale landscape, where blocks of wind-sculpted mixed woodland punctuate the relatively flat to gently rolling plain.

At the centre of the Lancashire and Amounderness Plain lies the estuary and lower reaches of the River Ribble which has its source in the neighbouring Yorkshire Dales and its tributary, the River Darwen which drains the Southern Pennines. The River Douglas and its tributaries, the rivers Yarrow and Lostock, drain much of the southern half of the NCA, with the River Douglas flowing into the southern side of the Ribble Estuary. The headwaters of these rivers are on Rivington Moor, in the Southern Pennines NCA. South of the Ribble Estuary the plain has a different physiographical history to that of the north, and this is reflected in the land use of the area. It is predominantly highly productive arable land with large fields and is internationally important for wintering wildfowl such as pink-footed geese and whooper swan and wading birds such as golden plover and oyster catcher.

Agricultural drainage systems, including steep-sided ditches with localised reedbeds and steep embankments, are a dominant feature, and are responsible for the area’s dramatic transformation from marshland to a rich and ordered landscape of farmed land parcels. This is mainly an area of open, high-quality farmland with large, rectilinear fields bounded by ditches, as well as some pasture for sheep and cattle, with scattered remnant woodlands and wetlands. Coastal inland areas in the south of the NCA fall below sea level, as far inland as the base of Parbold Hill and flooding is a recurring risk. The forecasted impacts of rising sea levels resulting from climate change will make this issue worse, presenting an ongoing challenge to the farming community. This area, which also contains Martin Mere SPA, is key feeding ground for the birds associated with the estuary such as pink-footed geese, teal and pintail.

There are significant pond networks to both the north and south of the Plain, emphasising its importance in providing ecological connectivity between pond habitats.

Small pockets of semi-natural species-rich grasslands remain in southern parts of the Plain. Coastal grazing marshes and floodplain grazing marshes found here are associated with the estuaries of the Rivers Wyre and Ribble and are recognised as functionally linked land around the Morecambe Bay & Duddon Estuary SPA and the Ribble & Alt Estuary SPA. They are internationally important for the wildfowl and wader populations they support (as above). Relict acid grasslands are also found around Martin Mere in the Rufford area where, despite being inland, they show some affinity with dune grassland as sand sedge is present.

The NCA includes approximately 4,343ha of woodland (6% of the total area), of which 518ha is ancient woodland.

Lancashire Valleys

The Lancashire Valleys run north-east from Chorley through Blackburn, Accrington, Burnley and Nelson to Colne. The NCA lies mainly in east Lancashire and is bounded to the north-west by the Bowland Fells fringe and Pendle Hill, and to the south by the Southern Pennines. A small proportion of the area (5%) lies in the Forest of Bowland National Landscape.

Lancashire Valleys consists of the wide vale of the rivers Calder and Ribble and their tributaries, running northeast to south-west between Pendle Hill, the Bowland Fells and the Southern Pennines. The landscape here has an intensely urban character. The Millstone Grit outcrop of Pendle Hill, on the northern boundary and the fells of the Southern Pennines to the south create enclosure and serve as a backdrop to the settlements in the valley bottom. The north-west of the NCA contains the middle section of the River Ribble, which has its source in Ribblesdale in the adjacent Yorkshire Dales NCA, as well as the Ribble's confluence with the River Hodder, which drains the southern slopes of the Bowland Fells. In the south, the River Yarrow rises on Rivington Moor in the Southern Pennines before joining the River Douglas in the Lancashire and Amounderness Plain NCA to the west. A number of reservoirs lie on or close to the boundary with adjacent NCAs.

There is approximately 5,463ha of woodland in the Lancashire area of the NCA (8% of that total area). Much of this (91%) is broadleaved and is situated on steep valley sides. There is also a small amount of conifer plantation. There are approximately 1,462 ha of ancient woodland, of which 107ha is plantation on ancient woodland sites.

Small broadleaved woodlands, often ancient, are scattered throughout the remaining farmland associated with rivers, field boundaries and cloughs. The wooded, steep-sided and narrow cloughs are a characteristic feature of the Lancashire Valleys – for example, Priestly Clough in Accrington, Spurn Clough in Burnley and Lower Darwen Valley which comprises oak, alder and sycamore with areas of grassland flushes and wetland. Wood anemone, Herb Paris and small-leaved lime are all ancient woodland indicators and typical species in these areas. Wet woodlands dominated by alder occur on the flood plains and riverbanks. There are also small areas of woodland and scrub associated with abandoned or reclaimed industrial land and several small conifer plantations, the largest being Standardise Plantation by Elslack Reservoir to the north-east of Colne.

Small pockets of semi-natural species-rich grassland remain in the valleys that have not been agriculturally improved, while some upland acid grasslands are found in the areas of upland fringe. Floodplain grazing marsh associated with the river valleys is present. Species-rich lowland dry acid grasslands are found on fluvio-glacial sands along the River Darwen. Waxcap grasslands are likely to occur too, although further research is required to identify their locations.

One of the key characteristics is that field boundaries are regular to the west and more irregular to the east. They are formed by hedges with occasional hedgerow trees and by stone walls and post-and-wire fences at higher elevations.

Bowland Fringe and Pendle Hill

The Bowland Fringe and Pendle Hill NCA is a transitional landscape that wraps around the dramatic upland core of the Bowland Fells, underpinned by Carboniferous geology. The cultural heritage is an integral part of its character with a range of rich and distinct landscapes, including the substantial extent of semi-natural woodland, tree-fringed rivers, and irregular field patterns defined by well-maintained hedgerows and hedgerow trees. Improved pastureland defined by well-maintained hedgerows is characteristic of the agricultural land in the fringes, which supports both dairy and livestock farming. In contrast to the predominantly rural feel, this NCA includes several relatively urban areas in Clitheroe, Bentham and Longridge.

Over half of this NCA, along with the Bowland Fells, makes up the Forest of Bowland National Landscape. This is a diverse landscape of herb-rich hay meadows, lush pastures, broadleaved woodland, parkland, waterbodies, rivers and streams. The numerous river valleys and associated woodlands are a major component of the area. To the west, this NCA includes part of the Bowland Fells SPA, where the influence of human habitation and activity, and the area's long farming history, contribute significantly to its character. Calf Hill and Cragg Woods SAC to the north of the Forest of Bowland is designated for its old sessile oak woods on the north- and south-facing slopes of a valley on millstone grit.

Many of the meadows are nationally or internationally designated, including North Pennine Dales Meadows SAC (which supports globe flower and lady's mantle species). The rivers and streams support nationally and internationally protected species, including Lancashire LNRS Target Species Atlantic salmon and smelt, as well as white-clawed crayfish, otter, water vole, river water-crowfoot, wasp and cranefly species and various species of bat.

Lowland calcareous grassland occurs in association with the scattered limestone knolls such as Long Knots, Great Dunmow Hill, Worsaw Hill; one of the best examples being on the Clitheroe Knoll Reef SSSI designated for its geological interest.

Unimproved species-rich grassland on neutral soils is a rare habitat in Lancashire due to the influence of agricultural improvement and development. There are however a few upland hay meadows around the margins of Bowland Fringe and Pendle Hill. Floodplain grazing marsh found here are associated with the river valleys of the Lune, Wyre and Ribble. Species-rich purple moor-grass and rush-pastures, valuable for ground nesting waders, including curlew lapwing, redshank and snipe, are found in patches in mosaic with dry grassland and wet woodland.

Species-rich lowland dry acid grasslands are found only very sparsely due to historic heavy stock grazing which has reduced their species-richness. Important locations for upland acid grasslands in Lancashire lie primarily within the Forest of Bowland SPA, in the Bowland Fells and the Bowland Fringe and Pendle Hill NCAs; where they contribute to the important upland vegetation mosaics alongside blanket bog, heath and flush habitats. Waxcap grasslands are also present. The NCA contains 5,060ha of woodland (7% of the total area), including 1,165ha of ancient woodland, almost a quarter of which is plantation on ancient woodland sites.

Southern Pennines

Upland areas within the Lancashire districts of Burnley, Chorley, Hyndburn, Pendle, Rossendale as well as Blackburn with Darwen reside within the Southern Pennines NCA. The Southern Pennines are part of the Pennine ridge of hills, lying between the Peak District National Park and the Yorkshire Dales National Park. Major urban areas include Bacup, Darwen, Haslingden and Rawtenstall. The Southern Pennines are important for recreation due to the extensive open access areas and footpaths, and the sense of escapism they offer, along with the ease of access from large towns. Challenges for the area include managing the land to reduce downstream flooding, halting decline in the upland peat habitats, improving water quality, and managing increased recreational demand.

This is a landscape of large-scale sweeping moorlands, pastures enclosed by drystone walls and gritstone settlements contained within narrow valleys. The moorland plateau is dissected by many small, fast-flowing streams which are tributaries of multiple main rivers; the Aire and the Yorkshire Calder and Colne, draining to the east, the Roch and Irwell which drain to the south-west and the headwaters of the Lancashire Colne and Calder, the Douglas and the Darwen draining to the north and west. Most of the valleys are narrow and steep-sided with woodland on the steepest slopes.

With its high rainfall and impervious rocks, the area is a valuable water catchment area and contains a large number of reservoirs including Belmont reservoir and Turton & Entwistle Reservoir which support the bird features of the West Pennine Moors SSSI, black-headed gull, heron and Mediterranean gull and supply the water to adjacent conurbations.

The area contains internationally important mosaics of moorland habitats that support nationally rare birds such as merlin, short-eared owl, ring ouzel and twite. Nesting on the unenclosed moorland and foraging elsewhere, including wet grassland and rush pastures in the in-bye fields below the moorland line are wader species like lapwing and curlew.

There are large expanses of internationally important blanket bog and upland heathland within the West Pennine Moors SSSI, often botanically poor and dominated by purple moor grass, with *Sphagnum* mosses being quite rare primarily because of overgrazing, over burning and atmospheric pollution. Upland dry heath, dominated by common heather, occupies the lower slopes of the moors on mineral soils or where the peat is thin. In the wooded cloughs, which transition into the heather moorlands, a greater mosaic of habitats and plants can be found.

The peat soils include blanket bog, a statutory irreplaceable habitat that supports rare and threatened species such as golden plover and dunlin, dwarf shrub species like cranberry and bog-rosemary as well as peat forming *Sphagnum* mosses.

The heathlands and blanket bogs, in mosaic with smaller habitat features such as upland acid flushes are an important component of the blanket mire landscape. They support species such as round-leaved sundew and include lime-rich flushes with carpets of lime-loving bryophytes, fens and areas of bracken and scrub, which support nationally rare bird species.

Upland hay meadow habitat reaches its southern British limit of distribution in Lancashire in the Southern Pennines NCA. Species-rich purple moor-grass and rush-pastures are found very patchily within the Southern Pennines. Stands are sometimes found within the margins and clearings of wet woodland along cloughs, for example at Owshaw Clough in the West Pennine Moors SSSI. In the West Pennine Moors SSSI area of the Southern Pennines NCA, most areas of lowland acidic grassland have arisen through the degradation of heathland through a combination of fires and overgrazing and latterly affected by environmental nitrification. Historically many of these grassland areas would have supported oak woodland. [xx]

Other important grasslands include upland acid grasslands found within the South Pennine Moors SAC/SPA and waxcap grasslands. A survey of upland fringe fields in the West Pennine Moors SSSI found a total of 23 different waxcap species, though individual fields fell just short of qualifying for SSSI notification for this feature[xxi].

There is approximately 3,026ha of woodland in the Lancashire area of the NCA (8.6% of the total Lancashire area found within) of which 70%, 2,115ha, is broadleaved woodland. Of the woodland resource, 11% (332ha) is ancient woodland.

The West Pennine Moors includes a number of acid oak woodlands often along steep-sided cloughs and water courses, some of which are remnants of temperate rainforest for example at Stronstrey Bank, Lead Mine's Clough, Dean Wood, Tiger's Clough, Hall Wood and Longworth Clough.

Woodland habitats include oak woodlands with downy birch, rowan, holly and hazel with ground flora comprising wavy hair-grass, interspersed with ferns, (such as hard-fern and lemon-scented fern), dwarf shrubs (such as bilberry) and woodland flowers (such as wood sorrel). These may be interspersed with wet woodland with species-rich flushes comprising species such as marsh hawk's beard, marsh valerian and many blue-green sedges. The woodlands are also important because they support a diverse assemblage of woodland breeding birds, including scarce and/or rapidly declining species such as pied flycatcher and willow tit. Extensive woodland clearance of higher land during the later Neolithic period and the Bronze Age has formed the open peat landscapes of today.

Lancashire Coal Measures

The Lancashire Coal Measures surrounds the towns of St Helens and Wigan and extends from the Mersey Valley in the south to the Lancashire and Amounderness Plain in the north-west. 10% of this NCA lies within the districts of Chorley and West Lancashire. Rocks from the Carboniferous Coal Measures underlie most of the area,

giving rise to a varied topography of gentle hills and valleys, with patchy layers of glacial deposits. The area is crossed by a number of rivers. The River Douglas is the largest of these and drains through West Lancashire alongside the Leeds and Liverpool Canal which eventually connects to the river.

Past industrial activity and mining subsidence have severely altered the drainage and landform of the area, creating a disrupted drainage pattern characterised by low-lying waterbodies, subsidence flashes and peatlands as well as remaining fragments of ancient woodland. This has created the habitat for an array of important species such as the red-eyed damselfly, willow tit, bittern and one of the LNRS target species, the large heath butterfly. This led to the 2022 designation of the Wigan Flashes National Nature Reserve (NNR) in Greater Manchester.

Manchester Pennine Fringe
The Manchester Pennine Fringe occupies the transitional zone between the open moorlands of the Dark Peak and Southern Pennines, and the densely populated urban conurbation of Manchester. Very small areas of Rossendale as well as Blackburn with Darwen lie within this NCA.

Numerous rivers flow through the area, with the Irwell's source in Rossendale district found in the Southern Pennines NCA to the north which drains down through the Southern Pennines towards the lowland Manchester Conurbation and Mersey Valley, ultimately flowing into the Mersey Estuary and the Irish Sea. These rivers are important links between the uplands and lowlands, in terms of ecological connectivity as well as water management.

Sefton Coast
This area runs from the mouth of the Ribble Estuary in the north to the edge of Crosby in the south. It is characterised by intertidal sand flats and mudflats, coastal sand dunes, coastal dune heathland and conifer plantations, and is backed by a hinterland of flat farmland. It is a small area of this hinterland that lies within West Lancashire. The landscape is low-lying with complex hydrology, with much of the area at or below sea level. The coastal hinterland is extensively pumped to drain the land for agriculture and to provide flood protection for urban areas.

The River Alt rises in the urban area of Huyton in Merseyside, and flows into the Irish Sea at Hightown, south of Formby. The wide flood plains of the Crossens catchment extend into the Lancashire and Amounderness Plain, with a large network of modified watercourses and a multiple land drainage system discharging into the Ribble Estuary. The sedimentary shoreline experiences a range of physical environments influenced by shallow water and high tidal ranges. This has led to the development of extensive sandy and muddy/sandy beaches along the coast. Dunes of recent wind-blown sand present the dominant landscape feature along much of the coast.

Yorkshire Dales
A small area of the Yorkshire Dales NCA overlaps with Lancaster district. A number of limestone outcrops within peatland are found within this area together with a small area of limestone pavement, sink holes and a large cave system. This limestone scenery is characterised by the virtual absence of surface drainage and an extensive subterranean drainage network which has resulted in these features[xxii]. There are also

areas of scree and drystone walls. Leck Fell, a limestone fell at 627m, is the highest point in Lancashire. Its slopes support semi-natural species-rich grasslands and grazing is the dominant land use. The landscape of drystone walls and field barns reflects the farming traditions. There are also small areas of irreplaceable habitats, ancient woodland and lowland fen.

Areas of Particular Importance for Biodiversity in Lancashire

Existing areas of particular importance for biodiversity are defined in the LNRS statutory guidance. This is to help establish a nationally consistent baseline of areas whose particular importance has already been recognised.

These areas in Lancashire are detailed below and can be viewed here:
Areas of Particular Importance for Biodiversity in Lancashire

International Conservation Sites

13% of Lancashire (41,586 hectares) is covered by a Special Protection Area (SPA) or Special Area of Conservation (SAC). These include:

- Bowland Fells SPA
- Calf Hill & Cragg Woods SAC
- Leighton Moss SPA
- Martin Mere SPA
- Morecambe Bay and Duddon Estuary SPA
- Morecambe Bay SAC
- Morecambe Bay Pavements SAC
- North Pennine Dales Meadows SAC
- Ribble & Alt Estuaries SPA
- Part of the South Pennine Moors SPA and SAC

Ramsar Sites within Lancashire include Leighton Moss, Martin Mere, Morecambe Bay and the Ribble and Alt Estuaries.

National Conservation Sites

Nationally designated conservation sites in Lancashire Include:

- Two National Nature Reserves (NNR): Gait Barrows and the Ribble Estuary
- Two Marine Conservation Zones (MCZ): Ribble Estuary and Wyre-Lune.
- 70 Sites of Special Scientific Interest (SSSI) covering a total of 49,247 hectares.

Local Nature Reserves (LNR)

Local Nature Reserves are designated for their natural features, such as habitats, wildlife, or geology, and managed by local authorities for environmental education and the enjoyment of the public. At least part of each LNR should be publicly accessible by anyone where visitors would not damage or disturb wildlife.

Biological Heritage Sites (BHS)

Biological Heritage Sites is the name given in Lancashire to non-statutory wildlife sites of at least County significance. They are considered to form part of the suite of sites collectively referred to as 'locally designated sites' in the National Planning Policy Framework, and elsewhere as 'Local Wildlife Sites'.

There are currently 1,215 Biological Heritage Sites, covering a total area of 34,298 hectares. Although they do not have statutory protection per se, some are equal in quality to the representative sample of sites that make up the suite of statutory Sites of Special Scientific Interest (SSSIs). They are identified and designated by a

partnership comprising Lancashire County Council, Lancashire Wildlife Trust and Natural England, using a set of published guidelines[xxiii].

District Wildlife Sites

District Wildlife Sites are considered part of the suite of Local Wildlife Sites. These sites are identified by district councils and unitary authorities and have various names locally. They are one 'tier' below Biological Heritage Sites and are not identified in all local authorities in Lancashire. They may also have an important role in contributing to the public enjoyment of nature conservation.

Statutory Irreplaceable Habitat

The statutory irreplaceable habitats found in Lancashire, as defined by The Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024 are:

- ancient woodland
- ancient and veteran trees
- blanket bog
- coastal sand dunes
- limestone pavements
- lowland fens

Mapped, these core sites, our existing areas of Particular Importance for Biodiversity, help us to identify opportunities to connect and link them up to provide more and higher-quality habitats to allow nature to thrive and species to recover, expand and move across the landscape, and in turn create our Local Habitat Map including Areas that Could Become of Particular Importance across the landscape as a whole and not just in isolated reservoirs. It should be noted that the mapped areas are based on best available information and will be updated when new monitoring data becomes available in future iterations of the LNRS.

Habitat Extent

In the absence of local habitat trend data and a state of nature report for Lancashire, Table 1 provides a summary of habitat extent, extracted from the Local Habitat Map. Information on the data sources used to create the habitat map can be found in the *Evidence and Technical Information* document.

Table 1: Coverage of broad habitat types in Lancashire
(area and % coverage of total county area calculated using the Local Habitat Map[2])

Habitat category	Habitat area ha.	% of total county area
Acid grassland	26,043	7.5
Arable	31,240	9.5
Built environment and residential gardens	37,340	10.5
Calcareous grassland (including limestone grasslands)	597	0.2
Coastal and floodplain grazing marsh	12,291	4
Coniferous woodland	4,392	1
Deciduous woodland (includes temperate rainforest orchards and wood pasture parkland)	18,660	7.6
Fen, Marsh and swamp	7,053	2
Heath	12,591	4
Improved grassland	90,231	27
Inland rock (including exposed limestone pavement)	851	0.3
Littoral sediment and rock (includes littoral sediment, sand dunes, dune slacks, maritime cliff, mudflats, saltmarsh, saline lagoons, shingle, supralittoral sediment)	22,293	7.8
Lowland bog (including raised bog, shallow peat (<40cm), deep peat (>40cm), lagg and agricultural peat)	263	0.1
Mixed woodland	955	0.3
Modified grassland (including amenity and tall ruderal)	5,294	2
Neutral grassland	13,592	4
Rivers, streams and drains	9,385	3
Rough grassland (OS National Geographic Database habitat type)	2,650	1
Scrub	474	0.2
Semi-improved grassland	3,906	1
Standing Open Water and Canals	4,891	1

[2] For information on how the Local Habitat Map was derived see the 'Habitat map' section of the Evidence and Technical Information supporting document.

Suburban (including verges)	3,807	1
Upland bog	17,361	5
Total broad habitat	**326,160**	

Table 2: Coverage of irreplaceable and other important habitat types in Lancashire not included in Table 1
(Area and % coverage calculated using the Local Habitat Map. These include transitioning habitats and overlapping habitats and when included will therefore exceed the overall size of Lancashire)

Habitat	Ha	% of total land area
Ancient woodland	5,159	2
Hedgerows	21,877 (km)	
Lowland fens	815	0.2
Limestone pavements	8	0.002
Purple moor-grass and rush pastures	212	0.1
Reedbeds	134	0.04
Sand Dunes	374	0.1
Saltmarsh	4,093	1
Temperate rainforest	195	0.1
Upland hay meadows	102	0.03

Species

Due to Lancashire's diversity of habitats, including everything from the upland fells to the coasts and estuaries, as well as farmed and urban landscapes, there are also thousands of species that make Lancashire their home. Considering factors such as their scarcity, decline and whether they are or could be of national importance, 534 species have been identified as the most threatened or locally significant to prioritise for recovery action. The full species list is included in the *Evidence and Technical Information* supporting document[3]. While trends for many of these species are currently unavailable, a number can be identified as being of national significance, these are detailed in Table Two.

Table 3: Shortlisted species where the Lancashire population is of national significance (LNRS Target Species in Bold. Some species appear across more than one habitat group).

Habitat	Lancashire species with populations of National Significance
Aquatic & Wetland	**14 Species:** Birds - Sedge warbler, bittern, curlew, willow tit.

[3] *Appendix Ten.*

	Plants - divided sedge, bird's-eye primrose, flat-stalked pondweed, narrow small reed, thread rush, green-flowered helleborine, floating water-plantain. Fish - **European smelt, Atlantic salmon,** eel**;** Amphibians - Great crested newt, Mammals - Water vole, Invertebrate (Crustacean) - White-clawed crayfish.
Coastal & Estuarine	**20 Species**: Birds - **Black-tailed godwit**, curlew, redshank. Fish - plaice, sole, **European smelt, Atlantic salmon,** eel**.** Invertebrates - saltern neb moth, black sober moth, sandhill rustic moth, **belted beauty**, vernal mining bee, margined colletes bee, *Podalonia affinis* (a wasp). Plants - variegated horsetail, Baltic rush and a hybrid *Juncus balticus x J. inflexus,* seaside centaury, dune helleborine, divided sedge and lax-flowered sea-lavender.
Peatland	**7 Species:** Birds - **Hen harrier**, curlew. Invertebrates – **Large heath butterfly, bilberry bumblebee**, the northern sallow mining bee. Plants - broad-leaved cotton grass and **dwarf cornel** (for England).
Rocky habitats	**17 Species:** Plants - Dark-red helleborine, Killarney fern, narrow-leaved bitter-cress, angular Solomon's-seal, fingered sedge, rock whitebeam, Lancastrian whitebeam, baneberry, rare spring-sedge, **lady's-slipper orchid**, mezereon, wall whitlowgrass, blue-moor grass. Invertebrates - barred tooth-striped moth, white-spotted sable moth, **least minor** moth and *Scythris fallacella* (a moth).
Wooded habitats & Trees	**19 Species:** Birds - Willow tit, Plants - green-flowered helleborine, narrow-leaved bitter-cress, angular Solomon's-seal, fingered sedge, rock whitebeam, Lancastrian whitebeam, *Rubus accrescens* (a bramble). Invertebrates - **high brown fritillary, pearl-bordered fritillary and Duke of Burgundy** butterflies, barred tooth-striped and netted carpet moths, **wall mason bee, red wood ant**, shiny guest ant, *Passaloecus monilicornis* (a solitary wasp), *Pseudoplatylabus violentus* (a parasitic wasp), and broad margin mining bee.
Grassland (Including agricultural land)	**19 Species:** Birds – Curlew. Plants - Purple ramping-fumitory, bird's-eye primrose, *Alchemilla monticola* and *Alchemilla subcrenata* (lady's-mantle species). Invertebrates - **least minor**, white-spotted sable, rufous marble, bronze owlet, *Elachista cingillella* and *Anania terrealis* (all moth species), **wall**

	mason bee, **tormentil mining bee**, moss carder-bee, *Lasius sabularum* (an ant), *Pseudoplatylabus violentus* (a parasitic wasp), **high brown fritillary, pearl-bordered fritillary and Duke of Burgundy** and northern brown argus butterflies.
Urban habitats (including infrastructure networks)	**5 Species:** Birds - Swift, **lesser black-backed gull, black-headed gull**, Invertebrates - European hornet Amphibians - Great crested newt.

24 species have been identified as 'target species', those that require multiple or urgent bespoke actions that could not be delivered through habitat measures. These are:

Mammals:

- Red squirrel

Fish:

- Atlantic salmon
- European smelt

Birds:

- Hen harrier
- Black-tailed godwit
- Black-headed gull
- Lesser black-backed gull

Plants:

- Yellow Star-of-Bethlehem
- Northern bedstraw
- Wood Crane's-bill
- Melancholy Thistle
- Lady's slipper orchid
- Petty whin
- Dwarf cornel

Invertebrates:

- Duke of Burgundy butterfly
- High brown fritillary butterfly
- Pearl-bordered fritillary butterfly
- Large heath butterfly
- Belted beauty moth
- Least minor moth
- Wall mason bee
- Tormentil Mining-bee
- Bilberry bumblebee
- Red wood ant

Pressures and Opportunities

In the absence of a state of nature report for Lancashire, stakeholders, including the Lancashire Environmental Records Network, local environmental organisations, and other specialists provided information to better understand Lancashire's most important habitats and species, the pressures that are influencing them and the opportunities to aid their recovery.

Pressures on Lancashire's biodiversity

Climate change is acknowledged as a leading pressure across all of Lancashire's broad habitat types. Changing weather patterns with warmer drier summers and warmer, wetter winters with more frequent extreme weather events are likely to become the norm [xxiv]. Flooding and the impacts to both wildlife and communities are a major pressure on watercourses, floodplains, wetlands, and the wider riverine environment. Bowland Fringe and Pendle Hill is a high-risk area within Lancashire. The areas steep topography and narrow flood plains combined with waterlogged moorland soils and high rainfall, produces watercourses that respond rapidly to rainfall, increasing fluvial flood risk. Saltwater flooding is a pressing threat on the coastal and floodplain grazing marsh of the Lune and Wyre River estuaries[xxv]. These coastal grazing marshes are at additional risk from sea level rise, leading to increased inundation, potential coastal erosion, and coastal squeeze, with freshwater sites adjacent to the coast sensitive to saline intrusion. Climate predictions suggest there will be a significant impact on existing and future wooded habitats. These include losses in soil carbon, carbon stored in vegetation and reduced ability of wooded habitats to store carbon in the future. Prolonged periods of drought are likely to lead to reduced ground water and drying out of wet woodland habitats making them more prone to soil erosion and wildfire events. Climate extremes are likely to increase the threat to trees and woodland habitats from new pests and disease.

Human activity such as land use changes, urbanisation, recreation, and pollution have impacted the natural environment and biodiversity. Diffuse water pollution and nutrient enrichment from multiple sources is a particular concern. Some of Lancashire's core sites are particularly impacted by diffuse water pollution and nutrient enrichment, including around Leighton Moss SSSI, Martin Mere SSSI and the Lune, Ribble, and Douglas River catchments[xxvi]. With high rainfall coupled with a growing population and an ageing infrastructure, the Ribble catchment suffers significant point-source pollution from combined sewer overflows[xxvii].

Land is increasingly under pressure from development to meet the variety of needs of those that live and work here, for example the demand for new affordable homes and commercial space, transport, and utilities, to support energy generation, for food growing and recreation, resulting in habitat loss and fragmentation.

Land use practices can also be detrimental to biodiversity, for example a high proportion of species-rich neutral grasslands (especially hay meadows) occur on generally flat topography over deep soils. Consequently, they are readily ‘improved’ in agricultural terms into productive fields. Some national policies, subsidies and incentives have led to land management practices that have contributed to habitat loss and species decline for example wildflowers and the invertebrates they support in the Forest of Bowland over the last 80 years or so. During the last two centuries, both

lowland and upland peatlands in Lancashire were drained to lower the water table, dry the land and make it more productive. Other factors (such as historic peat extraction, overgrazing, inappropriate burning, and recreation) coupled with drainage have contributed to significant loss and degradation of our peatlands over many years.

Opportunities for recovery or enhancement

A range of opportunities were identified to overcome the existing pressures and likely future pressures on our most important habitats and species. Existing successes and potential new initiatives to provide wider benefits by expanding, enhancing, and re-connecting our most important habitats were considered. Opportunities were identified for each of the broad habitats, in many cases building on and expanding existing work being delivered by many organisations across Lancashire, see the 'Pressures and opportunities for recovery' tables for each of the broad habitat types below.

There are excellent opportunities to mitigate the impact of climate change and build resilience for example by building on the collaborative holistic approach to nature recovery through the Catchment Based Approach (CaBA) partnerships. The CaBA is an inclusive, civil society-led initiative that works in partnership with Government, Local Authorities, water companies, businesses and local groups, to maximise the natural value of our environment. These initiatives are a strong platform to launch engagement and educational projects with local communities and land manager networks to highlight the importance of river health.

Climate resilience could also be gained within the Wyre and Lune Estuaries by restoring saltmarsh through rewetting interventions, changes to grazing management and managed realignment through breaches to the seawall reconnecting low-lying farmland to saltmarsh systems.

Reinstating the natural hydrology and revegetating areas of bare peat on blanket bogs could reduce carbon emissions and slow the flow of water of the fells and reduce flooding pressure downstream. Upland peat soils are located in the headwaters of the upper catchments of our major rivers: the Wyre and its tributaries from the Bowland Fringe and Pendle Hill; the Ribble and its tributaries from the Bowland Fells, Bowland Fringe and West Pennines; and the upper Irwell from the Southern Pennines. Combining peatland restoration with sustainable land management will help reverse the decline of this irreplaceable habitat. Public body funding through existing sources such as ELMs and the Nature for Climate grant scheme is available. Stacking this funding with private investment through offers such as the Peatland Carbon Code standard or Water Industry National Environment Improvement Programme (WINEP) funding can help realise the potential.

Opportunities in the lowland peatlands vary on location and external factors. In West Lancashire, a move towards a new water level management board on lowland pump drained peat could see valuable natural capital conserved in high grade agricultural areas. A new water level management strategy following review of the historic and failing pump station infrastructure could enable a range of land use including agriculture, flood defence and conservation within the region. A new Water Level Management Board for the Alt Crossens catchments could incorporate more space for water in the landscape. All of which will build in climate resilience into our catchments.

The way in which trees and woodland are established and managed, both now and in the future will influence the abundance and quality of associated biodiversity as well as building climate resilience, improving water quality and providing places for recreations. Soil carbon is high under areas of woodland, and carbon storage and sequestration are provided by the woodland itself. Active management enhances the carbon storage balance, particularly when managed to supply the wood fuel industry as it offers a low-carbon energy source reducing pressure on fossil-fuel demand while increasing carbon storage in standing biomass. Restoration of Plantation Ancient Woodland (PAWs) is a good opportunity in Lancashire. Planning ahead to consider climate change adaptation by encouraging natural regeneration, and planting of both local provenance and more southerly provenance can increase resilience. Diversifying age and species structure can build resilience to disease, pests and more extreme weather events.

Instilling climate resilience within the connected landscape will benefit our important grassland habitats. Improving conservation land management practises through farming networks and stronger engagement with the land manager community on nature recovery and funding opportunities is key in ensuring that we safeguard our existing important grassland sites. Further work on identifying waxcap grasslands when land use changes are proposed in areas suspected to contain waxcap communities could help prevent the loss of these important ancient grasslands.

There are a range of opportunities to address land use pressures in Lancashire. Recreational impacts could be alleviated on the Morecambe Coast and Lune Estuary, through the collaborative development of a Strategic Recreational Access Management plan. Identifying and creating Suitable Alternative Natural Green Spaces (SANGs) within more localised urban settings to provide access to good quality green space and reduce pressures on important coastal habitats.

Developing or reviewing biodiversity management plans for active and recently closed quarries would be of great value for rocky habitat communities. Quarries have considerable potential for biodiversity and preserving their community composition could maintain and enhance the biodiversity value of these important sites whilst also improving habitat connectivity for species that use the complex mosaic of habitats at some stage in their life cycle. Lancashire and Cumbria are nationally recognised for the rare and unique wooded limestone hills and the pavements of Arnside and Silverdale. There is a need to better understand and then share best practice in the management requirements of these rare habitats to support species recovery.

The urban environment is rich in opportunities to enhance and improve existing green space to encourage more wildlife into our built environment. Improving our existing parks and gardens by planting broadleaved native trees and improving the structure of our park woodland can benefit both people and nature. Broadleaved native urban tree planting to build climate resilience through shading and cooling. Improving existing green urban spaces can also act as a Suitable Alternative Natural Green Space, alleviating recreational impacts. This can provide wider environmental benefits for our local communities improving health and quality of life and providing better access to wildlife rich green space.

Priorities and Potential Measures – what we need to do

Priorities are the long-term end results, and the potential measures are the practical actions that will help to deliver these priorities, they have been informed by the pressures and opportunities identified for habitats and species.

To cover the different types of places and spaces across Lancashire the priorities have been identified by seven broad habitat types and the target species which require their own bespoke set of measures.

Example – Considering the Pressures & Opportunities on Lancashire's Habitats to Establish our Priorities and Potential Measures

Water quantity extremes, a consequence of climate change, such as flooding is a pressure on Lancashire's flood plain meadows and downstream communities that was highlighted by our Aquatic and Wetland group. They then suggested an opportunity to overcome the pressure would be the creation of wetter areas throughout our river systems. This led to the priority, AW4 Catchments resilient to water quantity extremes. The group then worked up a selection of actions or potential measures to achieve the priority which included *AW4.4 -Bioengineering* and nature-based solutions* for moderation of water flows, such as reedbed filters, living dams, living revetments, tree and hedge planting and kested* hedgerows*. Suitable locations were then identified in Lancashire on our Local Habitat Map for this measure and, if carried out, would contribute to addressing the pressure. Species such as water vole, various fish species, riverine insects such as cranefly and wasps and white-clawed crayfish would all benefit. Wider benefits for people would include an improved water environment to provide sustainable resources for a growing population, drought resilience and soil loss prevention.

There may be many potential measures that support each priority, and a single measure may help to achieve more than one priority. They are not intended to be detailed instructions, but guidance for what appropriate action can be taken. **Before undertaking any measure**, it is important to obtain the permission of the landowner, carry out any necessary surveys/assessments and obtain the required consents and approvals from any relevant public bodies. A summary of some key compliance requirements is provided in Appendix Two.

Some measures have been mapped on the Local Habitat Map. The Map shows where the best opportunities to do something significant for nature recovery and the wider

environment have been identified and what the most beneficial measures could be. These measures are highlighted in green in the priority tables.

The habitat priorities will be of huge benefit to many of Lancashire's most important species. The 534 prioritised species have been assigned to groups called "assemblages", which are communities of species that exist in a particular habitat and will therefore be affected by some of the same pressures and share some of the same requirements and management needs. It is anticipated that these species assemblages are likely to benefit from similar habitat recovery measures.

The measures identified will also deliver wider benefits for the environment and people of Lancashire, as well as help to meet national targets and objectives. These benefits have been summarised to assist those using the LNRS to target action and evidence outcomes from potential projects. The benefits provided by individual potential measures will depend on precisely how, when and where they are carried out.

Aquatic and Wetland

The condition of Aquatic Habitats across Lancashire varies significantly (as does the number of different ways to assess them). However, broadly speaking, they are not in good condition. 88% of Lancashire's surface water bodies were classified as having 'moderate' water quality and all of our waterbodies failed in the Chemical Status of the Water Framework Directive Water Bodies assessment[xxviii].

In respect of aquatic and wetland species, water voles have undergone one of the most serious declines of any wild mammal in Britain during the 20th century having been lost from 94% of places where they were once widespread[xxix]. In Lancashire, although oystercatcher have shown an increase of 12%, our breeding curlew, lapwing and snipe are all in decline. The Ribble Rivers Trust use Trout and Salmon as indicators of catchment health, which allows identification of locations in poor condition. Both species are showing a concerning decline across the catchment.

To ensure continuity and integration of efforts to recover aquatic habitats and species, it is important to collaborate with our neighbouring authorities due to our connections with the Yorkshire Dales, South Cumbria Fells, Merseyside Conurbation and Mersey Valley.

Table 4: Pressures and opportunities for recovery (Aquatic & Wetland Habitats)

Pressures	Example Habitats Affected	Broad Species Assemblages Affected (including example species[4])	Opportunities Identified
• Pollution, sediment deposition and nutrient enrichment • Point source pollution • Climate change • Water quantity extremes such as flood and drought • Invasive species • Recreational impacts	Canals and ditches Flood plain meadows Grazing marsh Ground water Lowland fens Marsh Standing open water / Ponds Reedbeds Rivers Streams Upland flushes, springs, fens and swamps Wet woodland (also considered under the	**<u>Flushes</u>** **(including upland, lowland & wetlands)** 41 shortlisted species including - *Plants:* • Green-flowered Helleborine • Ivy-leaved bell flower • *Drepanocladus turgescens* (a feather moss) • *Plagiomnium ellipticum* (Marsh Thyme-moss) **<u>Standing open water</u>** **(including ponds, canals and ditches)** 29 shortlisted species including -	Natural flood management solutions to slow the flow of water and attenuate flow Creation of wetter areas throughout our catchments Tree planting in the upper catchments and riparian planting Sustainable Drainage Systems Reduce diffuse and point source pollution

[4] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

• Land management detrimental to biodiversity	trees & woodland group).	*Mammals:* • Water vole • Foraging bats *Amphibians:* • Great crested newt *Plants:* • Pondweed and water-crowfoot species **<u>Rivers & streams</u>** **(including riverbanks and riverine sediments)** 27 shortlisted species including - *Mammals:* • Otter *Fish:* • Numerous fish species *Invertebrates:* • Numerous crane-fly species • Freshwater pearl mussel • White-clawed crayfish **<u>Marsh</u>** **(including upland, lowland, fen and reedbeds)** 10 shortlisted species including - *Birds:* • Bittern • Sedge warbler • Snipe	entering our watercourses Reinstating our lost pond landscape in low lying areas Build on the successes of the Catchment Based Approach (CaBA) partnerships

Table 5: Aquatic and wetland priorities, potential measures, and associated benefits

AQUATIC AND WETLAND			
PRIORITY	**MEASURES**	**SHORTLIST SPECIES BENEFITED[5]**	**BENEFITS**
AW1. Enhanced existing river, stream and watercourse network and associated floodplains in Lancashire.	**AW1.1 -** Support the expansion of eels across the county for example by: • removing barriers to migration such as dams, • installing eel and elver passes, • improving water quality, • protecting key areas from habitat loss.	*Fish:* • **Atlantic Salmon** • **Smelt** • Brown trout • Lamprey species • Eels	National objectives and targets: 1, 2, 3, 4, 5, 8, 10, 11, 12, 13, 14, 15, 16 Wider benefits: • improvements in water quality, • local economy and green jobs, • climate adaptation, • Water flow regulation, • reduction in flood risk, • social, cultural and educational Other linked LNRS Priorities: AW2, AW3. AW4, C1, C2, C3 G1, U1, U2, U4, W2
	AW1.2 - Improve the extent and condition of floodplain habitats including floodplain meadows, damp grassland, grazing marsh, reedbeds, wet woodland and lowland fen.	**Flood plain habitats** *Mammals:* • Otter *Birds:* • Ruff • Redshank *Invertebrates:* • **Belted beauty moth** • Crescent striped moth *Plants:* • Divided sedge • Meadow barley	

[5] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

	<u>Reedbeds</u> *Mammals:* • Harvest mouse *Birds:* • Sedge warbler • Bittern • Lapwing. **<u>Wet woodland</u>** *Birds:* • Willow tit • Sedge warbler *Plants:* • Dark-leaved willow • Bryophytes including *Plagiomnium ellipticum* (marsh thyme-moss).
AW1.3 - Sensitive management of ditches and other watercourses for biodiversity for example by: • Reduced livestock grazing along the water's edge to reduce trampling. • Control the extent of trees and scrub along waterways so other native, non-invasive vegetation important for biodiversity is not shaded out. • If bankside cutting is required, cut on a two-year rotation (or longer), leaving one bank uncut each year. • De-silting of ditches on a five-year rotation.	*Mammals:* • Water voles • Harvest mice *Amphibians* • Common toad *Invertebrates:* • Norfolk Hawker dragonfly *Plants:* • Aquatic and marginal vegetation such as water-

		crowfoot and pond weed species.	
AW2. Natural river processes restored, with habitats connected along water courses and between their flood plains.	**AW2.1** - Increase the multiplicity and structural diversity of water course corridors to include multiple and sinuous channels, the natural supply of sediment, woody material and gravel management. **AW2.2** - Remove or redesign artificial structures impacting natural processes of water courses including culverts, weirs, revetments, embankments and installation of fish passage solutions. **AW2.3** - Re-meandering of reaches of straightened and artificial modified channels of rivers and streams.	*Mammals:* • Otter • Water voles *Fish:* • Eels • **Atlantic Salmon** • Smelt • Brown trout • Lamprey species *Invertebrates:* • Scarce yellow splinter (cranefly) • Norfolk Hawker dragonfly • Freshwater pearl mussel • White-clawed crayfish	National objectives & targets: 1, 2, 3, 4, 5, 8, 10, 11, 12, 13, 14, 15, 16 Wider benefits: • restore natural hydrology and hydro-geomorphic processes including sediment and nutrient deposition • reduction in flood risk to downstream communities • climate resilience • local economy and green jobs, • water attenuation • improve natural function, • health and wellbeing • social, cultural, and educational Other linked LNRS Priorities:

			AW1, AW3, AW4, C1, C2, C3, G1, G2, P1, P2, P3, P4, P5, P6, W2, U1, U2, U3, U4
AW3. A restored and connected healthy freshwater and wetland landscape in Lancashire.	**AW3.1.1** - Restoration of Lancashire's lost pond landscape **AW3.1.2** – Rotational pond management to preserve marginal, emergent and submerged vegetation. **AW3.2 -** Appropriate canal management to protect and maintain bankside, marginal, emergent and submerged vegetation. **AW3.3 –** Expand and enhance fens, reedbeds, springs, flushes, marshes, marsh fen and ephemeral waterbodies. **AW3.4 -** Restore and reconnect fragmented canal network.	*Mammals:* • Water voles • Foraging bats *Birds:* • Bittern • Sedge warbler • Snipe • Oyster catcher • Curlew *Amphibians:* • Great crested newt • Common toad *Plants:* • Green-flowered Helleborine • Ivy-leaved bell flower • Great fen-sedge • Golden dock • Pondweed and water-crowfoot species • *Drepanocladus turgescens* (a feather-moss) • *Plagiomnium ellipticum* (marsh thyme-moss)	National objectives and targets: 1, 2, 3, 5, 8, 11, 12, 13, 14, 16 Wider benefits: • natural resources, • health and wellbeing, • natural processes regulation such as water attenuation, • improved water quality • climate resilience, • local economy and green jobs, • reduction in flood risk to downstream communities, • improved connectivity • social, cultural and educational Other linked LNRS Priorities: AW1, AW2, AW4, C1, C2, C3, P1, P2, P3 P4, P5, P6, W1, W2, U2, U3, U4

<table>
<tr>
<td rowspan="3">AW4. Catchments resilient to water quantity extremes.</td>
<td>AW4.1 - Install woody material, including leaky dams to promote natural processes and provide habitat for a range of aquatic species.</td>
<td>Mammals:
Water vole
Fish:
Various species
Invertebrates:
Riverine invertebrate species such as craneflies and wasps
White-clawed crayfish</td>
<td rowspan="3">National objectives and targets:
1, 2, 3, 4, 5, 8, 9, 11, 12, 13, 14, 16
Wider benefits:
improved water environment to provide sustainable resources to support a growing population,
soil erosion prevention,
drought resilience,
local economy and green jobs,
natural flood-risk management,
promote natural processes
Other linked LNRS Priorities:
AW1, AW2, AW3, C1, C2, C3, G3, P1, P2, P3, P4, P5, P6, W2, U1, U2, U4</td>
</tr>
<tr>
<td>AW4.2 – Create biodiverse sustainable drainage systems incorporating habitats such as swales, ponds, wetlands and reedbeds.

AW4.3 - Sustainable abstraction plan for agriculture and horticulture in Lancashire.</td>
<td>Amphibians:
great crested newt
common toad
Invertebrates:
craneflies
Plants:
pondweed species
water-crowfoot species</td>
</tr>
<tr>
<td>AW4.4 - Bioengineering and nature-based solutions for moderation of water flows, such as reedbed filters, living dams, living revetments, tree and hedge planting and kested hedgerows.</td>
<td>As above, also:
Birds:
For example,
Sedge warbler (reedbeds)
Corn bunting and tree sparrow (hedgerows)</td>
</tr>
</table>

Coastal and Estuarine

The coastal expanse of Lancashire's strategy area spans from Silverdale to Birkdale Sands. This large expanse of coastline has several contributing main estuaries of the Ribble, Wyre, Lune, Keer, Kent and Leven with a myriad of smaller channels and outlets that feed into the coastline. There are extensive areas of river, coastal and estuary SSSIs which predominantly are in favourable condition.

Sand dunes are multiple systems that are vulnerable to increased disturbance and invasive plant species, as well as weather and sea conditions[xxx]. Over the past 150 years, more than 80% of the sand dunes in Lancashire have been lost[xxxi]. 90% of Lancashire's remaining sand dunes are in Fylde. The presence of three large golf courses on Lancashire's dune land has saved extensive areas of semi-natural vegetation, including the largest remaining areas of dune heath, from built development.[xxxii] However, without sensitive management of routine golf course operations such as drainage, irrigation, tree-planting, mowing, fertilising and re-seeding then their biodiversity value is at risk.

Coastal squeeze of inter-tidal habitats is an increasing pressure on biodiversity in Lancashire.

Table 6: Pressures and opportunities for recovery (Coastal & Estuarine Habitats)

Pressures	Example Habitats Affected	Broad Species Assemblages Affected (including example species[6])	Example Opportunities Identified
• Climate change • Drought & flooding • Land & sea management detrimental to biodiversity • Habitat loss • Development & physical modification • Pollution, sediment deposition and nutrient enrichment • Recreational impacts	Brackish reedbeds Coastal grasslands Coastal floodplain grazing marsh Coastal hinterland (functionally linked farmland) Coastal saltmarsh Coastal sand dunes Coastal vegetated shingle Coastal woodlands Estuaries Lowland rivers and watercourses Maritime cliffs Mudflats Non-saline lagoons Saline lagoons	**Estuaries** 14 shortlisted species including - *Birds:* • Ringed plover • Lapwing *Fish:* • Eel • Lesser sand eel • River lamprey **Dune slacks** **(including dune slacks/sand dune systems and coastal ditches and canals)** 10 shortlisted species including - *Invertebrates:*	Restore saltmarsh through rewetting interventions, changes to grazing management and managed realignment. Managed realignment, for tidal exchange. Juvenile fish and spawning habitat restoration in the middle and upper estuaries of the Lancashire and Amounderness Plain, Morecambe Coast & Lune Estuary, and Morecambe Bay Limestones. Promotion of a step change to agricultural management practices. Wetland and flood storage habitat creation in West Lancashire, Morecambe Coast &

[6] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

	Inter-tidal and sub-tidal cobble & boulder skears Open mosaic on previously developed coastal land	• Sand dart moth • tiger crane-fly *Amphibians:* • Common toad *Plants:* • Tubular water dropwort • Early sand-grass **<u>Sand dunes</u>** **(including beach and sand dunes associated with woodland, lowland heath and shingle)** 32 shortlisted species including - *Reptiles:* • Sand lizard • Adder *Invertebrates:* • White Colon moth • Black-headed leafcutter bee • Sand runner spider. *Plants:* • Dune helleborine • Seaside centaury • Creeping willow	Lune Estuary and Lancashire & Amounderness Plain to improve the current water management regime. Alleviate recreational impacts through public engagement for example, through raising awareness and Community wildlife projects and improvements to Suitable Alternative Natural Green Spaces

		<u>Saltmarsh</u> **(including transitional brackish marsh and floodplain grazing marsh** 19 shortlisted species including - *Birds:* • Redshank • **Black-tailed godwit** • Pintail *Invertebrates:* • Saltern neb moth • **Belted beauty moth** *Plants:* • Sea milkwort • Divided sedge **<u>Coastal rocky / maritime cliffs</u>** 4 shortlisted species including - *Plants:* • Common Scurvy Grass • Sea spleenwort (a fern) **<u>Coastal grasslands</u>**	

		9 shortlisted species including - *Invertebrates:* • White-dusted owlet moth • Vernal Mining bee *Plants:* • Field gentian • Hoary Cinquefoil	

Table 7: Coastal and estuarine priorities, potential measures, and associated benefits

COASTAL AND ESTUARINE			
PRIORITIES	**MEASURES**	**SHORTLIST SPECIES BENEFITED[7]**	**BENEFITS**
C1. Coastal habitats connected with wider ecosystems particularly transitional habitats.	**C1.1** - Create and restore coastal habitats (such as sand dunes, dune slacks and saltmarshes) to reverse fragmentation. **C1.2** - Remove or create pathways through barriers such as small weirs, road culverts and other riverbed modifications, to improve connectivity for species dispersal by focussing on barriers within main rivers at, or close to the tidal limit. **C1.3** - Create and enhance habitat corridors to support species migration including connectivity between coastal and freshwater ecosystems e.g., salt marsh, estuaries, intertidal pools, floodplain grazing marsh.	*Birds:* • Ringed plover • Lapwing • Redshank • **Black-tailed godwit** • Pintail • Ruff *Reptiles:* • Sand lizard *Fish:* • Eel • Lesser sand eel • **Smelt** • **Atlantic salmon** • Brown trout *Invertebrates:* • **Belted beauty moth** • Saltern neb moth • Sand dart moth • White Colon moth	National objectives and targets: 1, 2, 3, 4, 5, 8, 11, 12, 13, 14, 16 Wider benefits: • Natural resources quality, • Reduction in flood risk for coastal communities, • Natural processes regulation, • Climate resilience, • Local economy and green jobs, • Ensure resilient and healthy populations of coastal species. • Improve migration routes. • Health and wellbeing • Social, cultural, and educational Other linked LNRS Priorities:

[7] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

		• Black-headed leafcutter bee • Sand runner spider Plants: • Tubular water dropwort • Early sand-grass • Dune helleborine • Seaside centaury • Creeping willow • Divided sedge	AW1, AW2, AW3, AW4, C2, C3, G3, P1, P2, P3
C2. Naturally functioning coastal systems with dynamic processes forming embryonic and transitional habitats.	**C2.1** - Restore natural processes in coastal waters, estuaries, dune slacks, sand dunes and salt marsh habitats for example by: • Redesigning and realigning coastal flood defences • Creating naturally functioning saltmarsh creek networks, • Restoring natural hydrology in dune slacks, • Promote the natural growth of sand dunes, • Rewetting of desiccated coastal wetlands and grasslands. **C2.2** - Restore, create and actively manage dune slacks for example through scrape creation, management of frontal woodlands and scrub control. **C2.3** - Allow natural formation of embryonic habitats such as embryonic dunes, salt marshes (including strand line and pioneer vegetation) and dune slacks. **C2.4** – Manage and enhance sand dune habitats for example through sand patching and vegetation management to maintain a structurally varied habitat.	*Amphibians:* • Potential for future natterjack toad re-introductions • Common toad *Fish (coastal waters and estuaries are a key habitat for juvenile and larvae phase fish):* • Eel • Lesser sand eel • **Smelt** • **Atlantic salmon** • Brown trout • Cod • Plaice *Reptiles:* Sand lizard	National objectives and targets: 1, 2, 3, 5, 8, 11, 12, 13, 14 Wider benefits: • natural resources, • health and wellbeing • climate regulation, • local economy and green jobs, • reduction in flood risk to coastal communities, • restoration of coastal habitat dynamism, • safeguarding natural coastal processes, • social, cultural and educational Other linked LNRS Priorities:

			AW1, AW2, AW3, AW4, C1, C3, P1, P2, P3, U1, U4
C3. Expanded, enhanced and preserved coastal and estuarine habitat important to Lancashire.	**C3.1** - Create undisturbed coastal high tide roost sites for waders and coastal lagoons and islands for nesting sites. **C3.2** - Creation of estuarine, and lower river (between tidal limit and 1-2 miles upstream) riffle habitats to support key fish species for example by: • Installing natural features such as large wood or large rocks within the watercourse to alter flow and facilitate sediments to be deposited in desired areas. **C3.3** - Creation and restoration of naturally functioning saltmarsh habitat. **C3.4** - Creation of coastal habitats, including brackish reedbeds, coastal grasslands and wetlands within their former extent for example by reconnecting low-lying reclaimed and frequently flooded agricultural land to coastal and transitional habitats.	*Birds:* • Ringed plover • Lapwing • Redshank • **Black-tailed godwit** • Arctic tern • Common tern *Reptiles:* • Sand lizard *Invertebrates:* • **Belted beauty (moth)** • Dark green fritillary butterfly • Small heath *Fish (particularly riffle habitats):* • **Atlantic salmon** • **Smelt** • Lamprey species *Plants:* • Green-flowered helleborine	National objectives and targets: 1, 2, 3, 5, 8, 11, 12, 13, 14, 16 Wider benefits: • natural resources, • natural processes regulation, • reduction in flood risk to coastal communities, • climate regulation, Other linked LNRS Priorities: AW1, AW2, AW3, AW4, C1 C2, G1, G2, G3, P2, P3, U1, U4

Grassland (Including agricultural land)

Semi-natural grassland is one of the most threatened habitats in the UK, with a reported 97% loss of semi-natural enclosed grasslands in England and Wales between 1930 and 1984[xxxiii].

Between 1960 and 2013, semi natural grasslands in England declined by 47% overall[xxxiv]. Dry acid grassland saw the greatest loss (85%) while the extent of upland calcareous grassland was at 39% loss[xxxv]. The Floodplain Meadows Partnership estimate that about 1,100 hectares (ha) remain of the classic floodplain meadow plant community in England and Wales[xxxvi].

Most semi-natural grassland in England has been improved to benefit agricultural production, and the grasslands in Lancashire are no exception. The more natural and species-rich sites that remain are often small and isolated but can still support communities of specialised plant and animal species[xxxvii]. The annual value of carbon sequestration by vegetation in grassland is estimated to be approximately £0.2 billion[xxxviii].

Undertaking a range of enabling measures in the Supporting Actions sections will contribute towards achieving the Grassland including agricultural land priorities. The data and evidence as well as engagement and collaboration ones are of particular interest.

Table 8: Pressures and opportunities for recovery (Grassland & Agricultural Habitats)

Pressures	Example Habitats Affected	Broad Species Assemblages Affected (including example species[8])	Example Opportunities Identified
• Climate change • Land management detrimental to biodiversity • Habitat loss and fragmentation • Pollution, sediment deposition and nutrient enrichment	Coastal and floodplain grazing marsh Calcareous grassland Lowland dry acid grassland Lowland meadows and pastures Purple Moor Grass and Rush Pastures and other fen Upland acidic grassland	**<u>Arable & farmland</u> (including grazed pasture, arable and Farmland Mosaic /Hedgerows)** 11 shortlisted species including - *Birds:* • Corn bunting • Yellow wagtail • Tree sparrow; *Plants:* • 31 arable plant species. **<u>Unimproved Grassland</u>**	Improve land management practises through farming networks and stronger engagement with the land manager community on nature recovery and agri-environment funding opportunities. Funding reforms to incentivise land managers. Establish collaborative nature recovery programmes like the Farming in Protected Landscapes scheme and promote and support new and existing farming clusters/networks. Create a map and directory

[8] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

• Recreational impacts • Invasive species	Waxcap (CHEGD) grasslands	**(including ancient grasslands, dry grasslands and hay meadows)** 14 shortlisted species including - *Invertebrates:* • Wall butterfly • Phantom hoverfly *Plants:* • Dyer's greenweed • Globeflower *Fungi:* • 50 grassland fungi species. **<u>Calcareous Grasslands</u>** 22 shortlisted species including - *Invertebrates:* • Dingy skipper (Butterfly) • Northern brown argus (Butterfly) • **Least minor (Moth)** • Cistus forester (Moth) *Plants:* • Green-winged orchid • Moonwort. • *Rhytidium rugosum* (a feather-moss) • *Didymodon acutus* (a moss) **<u>Open Grassland Mosaics</u> including lowland, coastal, upland, damp, acid, rich flower resource (botanically species-diverse) and verges** 20 shortlisted species including - *Mammals:* • Harvest mouse • Polecat *Invertebrates:*	of green hay donors and donor sites that can provide the seed source to support hay meadow recovery projects. Create a directory of contractors who specialise in using smaller tractors and mowers for sites with limited accessibility to maintain low nutrient levels. Reduce verge (and some amenity grasslands) cutting regimes to increase sward diversity

		• Small heath butterfly • Tormentil nomad bee • Small flecked mining bee *Plants:* • Autumn crocus • Saw-wort **<u>Flushes /flushed grasslands</u>** 5 shortlisted plant species: • Marsh lousewort • Small water pepper • Mossy saxifrage • Lesser skullcap • Ivy-leaved bell flower **<u>Marsh</u>** **(including upland and lowland marsh/ fen and wet grassland)** 12 shortlisted species including - *Birds:* • Curlew • Oystercatcher *Plants:* • Heath Fragrant Orchid • Corky-fruited Water-dropwort • Marsh stitchwort	

Table 9: Grassland priorities, potential measures, and associated benefits

GRASSLAND (INCLUDING AGRICULTURAL LAND)			
PRIORITY	**MEASURE**	**SHORTLIST SPECIES BENEFITED[9]**	**BENEFITS**
G1. Ecologically important grasslands preserved and managed for biodiversity.	**G1.1** - Create and maintain conditions to allow thriving, resilient and dynamic populations of waders important to Lancashire dependent on key habitats including grasslands, peatland and arable land.	*Mammals:* • Harvest mouse • Polecat *Birds:* • Curlew • Oyster catcher • Lapwing *Invertebrates:* • **Least minor moth** • Cistus forester moth • **Duke of Burgundy butterfly** • **Pearl-bordered fritillary butterfly** • **High brown fritillary butterfly** • Wall butterfly • Dingy skipper • Northern brown argus butterfly • Small heath butterfly	National objectives and targets: 1, 2, 3, 5, 8, 11, 12 Wider benefits: • preservation of natural resources, • local economy and green jobs, • social, cultural and educational Other linked LNRS Priorities: AW1, AW3, C1, C3, G2, G3, P2, P5,
	G1.2 - Secure appropriate management of grasslands with high biodiversity value such as ancient permanent grasslands and grasslands rich in plant species, fungi, or invertebrates (for example, conservation grazing, preservation of undisturbed and uncultivated soils and maintenance of low nutrient levels, appropriate sward structure and hydrological conditions).		
	G1.3 - Secure appropriate conservation management of known fungi-rich grasslands, including (for example) preserving undisturbed soils with no cultivation, no nutrient inputs, maintaining suitable sward heights to allow fruiting and restricting scrub/tree encroachment.		
	G1.4 – Enhance grasslands by inoculating sites with appropriate plant species from suitable agreed donor sites.		
	G1.5 - Produce a local directory of resources to aid grassland management, facilitate sharing of equipment and access to appropriate grazing stock and seed donor sites.		

[9] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

	G1.6 - Undertake suitability assessments and grassland fungi surveys (fruit body or DNA) on long-established semi-improved and unimproved grasslands (including botanically species poor examples) subject to any proposal or land-use change which could disturb the soil or increase nutrient levels in the soil (such as tree planting, other habitat creation requiring soil disturbance, change in agricultural use, excavation, ploughing, nutrient enrichment, development etc) and use this information to assess importance and inform decision making, to ensure the conservation of ancient and important grasslands	• Tormentil nomad bee • Small flecked mining bee • Phantom hoverfly *Plants:* • Dyer's greenweed • Globeflower • Green-winged orchid • Moonwort • Autumn crocus • Saw-wort • Lesser skullcap • Ivy-leaved bell flower • Heath Fragrant Orchid • Corky-fruited Water-dropwort • Marsh stitchwort • *Rhytidium rugosum* (a feather-moss) • *Didymodon acutus* (a moss) Grassland fungi assemblage (for example, waxcaps and earthtongues): • Jubilee waxcap • Pink waxcap • Glistening waxcap • Brightsky pinkgill • Lilac pinkgill • Violet coral • Dark-purple earthtongue	

		• Rufous earthtongue	
G2. A connected network of biodiverse grassland habitats.	**G2.1** - Enhance habitat, for example, good, semi-improved grasslands to priority habitat, and create biodiverse grasslands buffering and connecting important habitats, through appropriate management including low nutrient inputs, species and sward diversification as well as conservation grazing and mowing regimes.	As above	National objectives and targets: 1, 2, 3, 5, 8, 11, 12, 14, 16 Wider benefits: • natural resources with improved soil health, • health and wellbeing, • crop pollination, • local economy and green jobs, • social, cultural and educational Other linked LNRS Priorities: AW1, AW3, C1, C3, G1, G3 P2, P5, U2, U3, U4
	G2.2 – Enhance grasslands by inoculating sites with appropriate plant species from suitable agreed donor sites for example where natural re-colonisation is unlikely.		
	G2.3 - Maintain and enhance biodiverse grassland verges such as identified biodiversity verges and wildflower verges which may be particularly valuable in aiding connectivity, including appropriate mowing regimes to enable flowering/seeding and removal of arisings.		
	G2.4 - Create biodiverse grassland verges in suitable locations to enhance habitat connectivity, for example, through species and sward diversification, conservation mowing regimes to enable flowering / seeding and removal of arisings.		

G3. Sustainably managed agricultural land with maximised biodiversity value, generating wider environmental benefits.	**G3.1** - Manage soils for enhanced biodiversity and improved soil health for example by reducing compaction, winter cover crop, crop and grazing rotation, produce a soil management plan.	*Mammals:* • Brown hare • Hedgehogs • Polecat • Roosting and foraging bats (including: Whiskered bat, Serotine, Lesser horseshoe) *Birds:* • Corn bunting • Yellow wagtail • Tree sparrow • Grey partridge • Corn crake *Reptiles:* • Grass snake *Amphibians:* • Great crested newt • Common toad *Plants:* (Arable assemblage): • Purple Ramping-fumitory • Corn marigold • Prickly poppy • Slender parsely-piert • Corn Chamomile	National objectives and targets: 1, 2, 3, 4, 5, 8, 9, 11, 12, 13, 15, 16 Wider benefits: • Improved water quality, • health and wellbeing • crop pollination, • improved soil health, • resilience in food production, • local economy and green jobs, • reductions in siltation, nutrient run-off, pollution, soil erosion, flood risk • social, cultural and educational Other linked LNRS Priorities: AW1, C2, C3, G1, G2, P5, U2
	G3.2 - Appropriately manage for arable species assemblages such as leave buffer strips, beetle banks, conservation headlands, maintain overwintering feeding habitat, overwinter stubble and field corners.		
	G3.3 – Create habitat within farming landscapes such as tree planting in field corners, individual trees, agro-forestry, field ponds and buffer habitats adjacent to watercourses and aquatic habitats.		
	G3.4 - Reduce the use of herbicide, pesticide and other agricultural chemicals.		
	G3.5 - Support and promote organic farming.		
	G3.6 - Reinstate historic field boundaries such as hedgerows, ditches and drystone walls.		
	G3.7 - Provision of habitat piles, nest and roosting boxes.		

Peatland

Lancashire contains approximately 135,000 hectares of peat soils, according to Natural England's Peaty Soils layer. Key upland areas include the Forest of Bowland, West Pennines and Forest of Rossendale, the first two of which are designated as SSSIs in part for the blanket bog habitat, the latter sits outside any such designation but is an important link between the West Pennine Moors and the South Pennines. Land-use in the uplands in the main is water company catchment, agricultural grazing land, grouse moors, common land and windfarms. Key lowland areas include the Alt Crossens and Pilling Moss. Some small areas of these are designated as SSSI but the majority sits outside of designation. Lowland peat areas are generally agricultural crop and grazing land.

Many of our peatlands are in a progressive state of degradation[xxxix]. Only 13% of England's peatlands are in a near natural state and much of our lowland peat is currently used for intensive agriculture[xl]. Winmarleigh Moss SSSI is the largest area of lowland raised bog remaining in Lancashire and is the only one that survives in anything like its original condition[xli]. White Moss SSSI in Ribble Valley is the best surviving example of an actively growing basin mire in Lancashire. At least 95% of the lowland peat mosses existing in Lancashire in 1948 have been lost.[xlii] This loss has mainly been due to reclamation for agriculture, peat extraction, repeated burning or afforestation. National blanket bog losses of 30% between 1930 and 1980 were mainly due to overgrazing, indiscriminate historic moor burning, afforestation and the abandonment of grouse moors.[xliii] No specific data is available on the condition of Lancashire's upland peat habitats, although it is expected that similar rates of loss will apply to Lancashire's upland peat habitats over the same period.

Table 10: Pressures and opportunities for recovery (Peatland Habitats)

Pressures	Example Habitats Affected	Broad Species Assemblages Affected (including example species[10])	Opportunities Identified
• Climate change • Land management detrimental to biodiversity • Habitat loss and fragmentation • Pollution, sediment	Blanket bog Hydrologically linked land Lagg fen Lowland heathland Lowland raised bog Mires & quaking bogs	**Bogs** **(including bog pools, blanket, raised and mire)** 21 shortlisted species including - *Birds:* • Dunlin *Invertebrates:* • 5 species of crane-fly	To engage sustainable management practices following habitat restoration. To stack public body funding and private investment in nature recovery (such as the Peatland Carbon Code standard or Water Industry National Environment Improvement Programme). Monitoring to evidence improvements following

[10] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

deposition and nutrient enrichment • Hydrological changes • Recreational impacts from off-road vehicles & dogs off leads. • Grazing intensity, mainly form sheep	Shallow peaty soils Upland heathland	• Keeled skimmer and golden-ringed dragonflies *Plants:* • Great sundew • Bog myrtle • *Sphagnum pulchrum* **<u>Scrub-heath & moorland with structural diversity</u>** **Moorland & Woodland Edge, lowland and upland heathland, upland flushes, marsh/fen and purple moor-grass & rush pasture** 53 shortlisted species including - *Birds:* • Short-eared owl • Ring ouzel • Snipe • Curlew *Reptiles:* • Adder *Invertebrates:* • Marsh fritillary butterfly *Plants:* • Mossy saxifraige • Common butterwort • Cloudberry *Lichen:* • Reindeer lichen	restoration and inform further restoration work. Develop a countywide wildfire strategy. Better engagement across the upland land manager sector, sharing best practice and upskilling contractors and practitioners. Develop a new water level management strategy. Opportunities for a more sustainable management approach to peatland soils through wetter farming.

Table 11: Peatland priorities, potential measures, and associated benefits

LOWLAND PEATLAND			
PRIORITY	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
P1. Sustainable land use of lowland peat soils creating a mosaic of peatland habitats supporting a variety of species.	**P1.1** - Wetter farming - where it leads to peat formation or transition to restoration for example *Sphagnum* farming, *Typha* growing, willow crop and carbon farming. **P1.2** - Productive agriculture on wet or rewetted peaty soils to buffer and enhance habitats adjacent to peatland habitats. **P1.3 -** Create or update sustainable water level management plans to: • Work with local partners and landowners to better manage all forms of flooding in the catchment in the future through promoting collaborative working and sustainable development. • Identify opportunities to improve Water Resource resilience to weather extremes. • Deliver Natural Flood Management / BNG and Water Quality improvements which support nature recovery, peat restoration, long term sustainability and reduction of operational costs. **P1.4 -** Landscape-scale joined up Wildfire Management Plans that cross land boundaries including a fire ranger scheme to educate public and with powers to close areas of high risk. **P1.5** - Work with DEFRA to pilot a northwest-wide traffic light system to manage fire risk.	*Mammals:* • Water vole *Birds:* • Willow tit • Cuckoo • Short-eared owl *Reptiles:* • Adder • Sand lizard *Invertebrates:* • **Large heath butterfly** • Cranefly species • *Macronychia griseola* (a 'flesh' fly) • *Empis prodromus* (a 'dance' fly) *Plants:* • Great sundew • Oblong-leaved sundew • Common butterwort • Bog myrtle • Hare's-tail cotton grass • White beak-sedge • Slender sedge • Small cudweed	National objectives and targets: 1, 2, 3, 5, 7, 8, 11, 12, 13, 14 Wider benefits: • Improved water quality, • Attenuating water flow (water quantity resilience), • Reduction in carbon emissions, • Increase in carbon sequestration, • climate resilience, • health and wellbeing • reduction in flood risk for local communities, • Local economy through green jobs Other linked LNRS Priorities: AW1, AW2, AW3, AW4, C1, C2, C3, G1, G2, G3, P2, P3

		• *Sphagnum pulchrum* • *Campylopus gracilis* (Schwartz's swan-neck moss) *Lichen:* • Reindeer lichen	
P2. Lowland peatlands and their supporting habitats restored and connected at a landscape-scale.	**P2.1 -** Restore and enhance key connecting and relict lowland peatland sites for example raised bog, lagg, fen, lowland heathland. **P2.2** - Hydrological restoration to support lowland peatland habitat creation and enhancement. **P2.3** - Create corridors and steppingstones of lowland peatland and other wetland habitats in between fragmented lowland raised bog and associated habitats for example wet woodland, reedbeds and wet heath. **P2.4** - Expansion, sensitive management and restoration of lowland heath.	As above	National objectives and targets: 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 14 Wider benefits: • Safeguarding natural resources by restoring peatlands, • Improved water quality, • Attenuating water flow (water quantity resilience), • Reduction in carbon emissions, • Increase in carbon sequestration, • climate resilience, • health and wellbeing • local economy and green jobs, • reduction in flood risk for local communities, • Filtration of pollutants (reedbeds). Other linked LNRS Priorities: AW1, AW2, AW3, AW4, C1, C2, C3, G2, G3, P1, P3

P3. Active growing lowland peatlands supporting rich biodiversity.	**P3.1** – Re-establish and restore lowland peatland habitats (such as lowland raised bog) on deep peat and in other locations with the potential to return to active peat-forming bogs. **P3.2** - Create transitional habitats between lowland peatland and non-peatland habitats in appropriate areas to support biodiversity and hydrology for example lagg, fen and wet woodland. **P3.3 -** Inoculate suitable lowland peatland sites for example raised bog, lagg, fen and lowland heathland with appropriate plant species from suitable donor sites.	As above	National objectives and targets: 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 14, 16 Wider benefits: • Safeguarding natural resources by restoring peatlands, • Improved water quality, • Attenuating water flow (water quantity resilience), • Reduction in carbon emissions, • Increase in carbon sequestration, • climate resilience, • local economy and green jobs, • health and wellbeing • reduction in flood risk for local communities, Other linked LNRS Priorities: AW1, AW2, AW3, AW4, C2, C3, W1, U2

UPLAND PEATLAND			
PRIORITY	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
P4. Functioning upland peatlands	**P4.1** - Restore hydrology of upland peat soils such as grip and gully blocking.	*Mammals:*	National objectives and targets:

forming peat at a landscape-scale.	**P4.2** - Revegetation of key upland peatland plant species in areas of restored hydrology dependent on site specific conditions including seeding, plug planting, encouraging revegetation. **P4.3** - Restore and reconnect appropriate relic areas back to active blanket bog and mire through management changes, practical interventions and encouraging *Sphagnum* growth. **P4.4 –** Re-establish and restore upland peatland habitats (such as blanket bog, wet heath and mire) on deep peat and in other locations with the potential to return to active peat-forming bogs. **P4.5** - Maintain and enhance existing blanket bog in good ecological/favourable condition through appropriate management for example sustainable grazing and cessation of burning.	• Water vole *Birds:* • **Hen harrier** • Merlin • Short-eared owl • Ring ouzel • Snipe • Curlew • Dunlin • Whinchat • Twite *Reptiles:* • Adder *Invertebrates:* • **Large heath** (Butterfly) • **Bilberry bumblebee** • Broken-banded bumblebee • Northern sallow mining bee • Keeled skimmer dragonfly • Golden-ringed dragonfly • Sheet weaver spider *Plants:* • **Dwarf cornel** • **Petty whin** • *Sphagnum pulchrum* • Great sundew • Bog myrtle • Broad-leaved cottongrass	1, 2, 3, 5, 7, 8, 11, 12, 13, 14, 16 Wider benefits: • Safeguarding natural resources by restoring peatlands, • Improved water quality, • Attenuating water flow (water quantity resilience), • Reduction in carbon emissions, • Increase in carbon sequestration, • climate resilience, • local economy and green jobs, • health and wellbeing • reduction in flood risk for local communities. • Contribution to the Great North Bog. Other linked LNRS Priorities: AW1, AW2, AW3, AW4, C1, C2, C3, G1, G2, G3, P1, P2, P3, P5, P6, R1, R2, R4, W1, W2, U1, U2, U3

		• Mossy saxifrage • Common butterwort • Cloudberry • Juniper Lichen: • Reindeer lichen	
P5. A mosaic of upland peatland, non-peatland and connecting transitional habitats in the uplands supporting a variety of species.	**P5.1** - Management to maintain and enhance upland peatland species and habitat diversity through, for example: • Alterations to site hydrology, burning, grazing and nutrient inputs, • Managing encroachment of bracken and other vegetation, • Adjustments to game management and predator control regimes. **P5.2 -** Management and restoration of upland heath through sensitive management. **P5.3 -** Management, restoration and expansion of species-rich purple moor-grass & rush pasture and upland flushes.	**Purple moor-grass & rush pasture** *Invertebrates:* • Marsh fritillary butterfly *Plants:* • Bryophyte species such as ribbonwort. **Upland flushes** *Plants:* • Ivy-leaved Bellflower • Marsh lousewort • Grass-of-parnassus • *Campylopus gracilis* (Schwarz's Swan-neck moss)	National objectives and targets: 1, 2, 3, 5, 7, 8, 11, 12, 13, 14, 16 Wider benefits: • Safeguarding natural resources by restoring peatlands, • Improved water quality, • Attenuating water flow (water quantity resilience), • Reduction in carbon emissions, • Increase in carbon sequestration, • climate resilience, • local economy and green jobs, • health and wellbeing • reduction in flood risk for local communities.

			• Contribution to the Great North Bog Other linked LNRS Priorities: AW1, AW2, AW3, AW4, C2, G1, G2, G3, P4, P6
P6. Sustainable land use and management of upland peat soils.	**P6.1** - Work with DEFRA to pilot a northwest-wide traffic light system to manage fire risk. **P6.2** - Landscape-scale joined up Wildfire Management Plans that cross land boundaries including a fire ranger scheme to educate public and with powers to close areas of high risk.	As above	National objectives and targets: 1, 2, 3, 5, 7, 8, 11, 12, 13, 14 Wider benefits: • safeguarding natural resources by restoring peatlands, • climate resilience, • local economy and green jobs, • health and wellbeing, • economic gain with new green jobs, • social, cultural and educational, • Contribution to the Great North Bog. Other linked LNRS Priorities: AW1, AW2, AW3, AW4, C2, G1, G2, G3, P1, P2, P3, P4, P5, W1, W2, U4

Rocky Habitats

Rocky habitats, some of which are natural and some of which are man-made, are found throughout Lancashire. Lancashire's limestone pavements are nationally rare habitats with 45% of their area having been damaged or destroyed by quarrying activity[xliv]. In 1990, only 3% of the area left remained undamaged.[xlv]

Post-industrial sites including former quarries, drained reservoirs, disused railways, and certain types of industrial tips have been colonised naturally by a wide range of plants and animal communities such as Mere Sands Wood Nature Reserve. These sites are valuable for their biodiversity and there is a need to recognise their importance in the context of pressure for development or redevelopment and a need to manage them appropriately to enhance their biodiversity value.

Table 12: Pressures and opportunities for recovery (Rocky Habitats)

Pressures	Example Habitats Affected	Broad Species Assemblages Affected (including example species[11])	Example Opportunities Identified
• Land management detrimental to biodiversity • Habitat loss • Invasive species • Recreational impacts – from activities such as climbing & caving, mountain biking etc. • Climate Change	Caves & mines Inland rock exposures and scree Limestone Pavements Man-made rock features (for example, man-made historic features like barns, sheep folds and dry walls). Open Mosaic on Previously Developed Land – outside urban areas (≥10,000 residents) Quarries Spoil heaps	**Limestone Habitat Mosaic with structural diversity** 42 shortlisted species including - *Invertebrates:* • Chestnut-coloured Carpet moth • Barred tooth-striped moth *Plants:* • Dwarf spurge • Mountain melick • Blue-moor grass • Dark-red helleborine • Baneberry • Juniper • *Tortella densa* (moss) **Limestone pavement/rock** **(often linked with the above)**	Develop current biodiversity management plans for active and recently closed quarries. Gain a better understanding of suitable biodiversity management of rocky habitats, write guidance and share best practice. Control both native and non-native invasive species to reduce encroachment. Work with Buglife and the Arnside and Silverdale National Landscape to conserve the nationally significant species found within this Important Invertebrate Area.

[11] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

		9 shortlisted species including - *Invertebrates:* • Grayling (butterfly) • Narrow-mouthed whorl snail *Plants:* • Lily-of-the-valley • **Northern bedstraw** • Limestone fern **<u>Rocky woodland</u>** 9 shortlisted species including - *Plants:* • **Lady's slipper orchid** • Killarney Fern • Spring Cinquefoil **<u>Exposed Rock (Acidic)</u>** including: • 10 lichen species. **<u>Exposed rock (Basic)</u>** 6 shortlisted species including - *Plants:* • Bloody Crane's-bill • Green spleen-wort • *Bryum elegans* (moss) • *Tortella squarrosa /Pleurochaete squarrosa* (moss) **<u>Exposed rock/crags</u> (scrub, heath, moorland)** 8 shortlisted species including- *Birds:* • Peregrine falcon *Plants:* • Hoary whitlowgrass	

		• Hay-scented Buckler-fern	

Table 13: Rocky habitats priorities, potential measures, and associated benefits

ROCKY HABITATS			
PRIORITY	**MEASURE**	**SHORTLIST SPECIES BENEFITED[12]**	**BENEFITS**
R1. Limestone pavement habitats with high biodiversity value.	**R1.1** - Suitable management of limestone pavements and associated ecologically valuable habitats e.g., open limestone pavement, limestone grassland, upland mixed ash woods, yew woodland, juniper scrub and bryophyte and lichen communities. **R1.2** - Re-establish the naturally occurring gryke communities. **R1.3 -** Write and promote the use of the limestone pavement handbook.	*Invertebrates:* • **Duke of Burgundy** (Butterfly) • **High brown fritillary** (Butterfly) • **Pearl-boarded fritillary** (Butterfly) • Grayling (butterfly) • Chestnut-coloured carpet moth • Barred tooth-striped moth • Narrow-mouthed whorl snail *Plants:* • **Lady's slipper orchid** • **Northern bedstraw** • Spring Cinquefoil • Limestone fern • Dwarf spurge • Mountain melick • Blue-moor grass • Juniper • Lancastrian whitebeam • Baneberry	National objectives and targets: 1, 2, 3, 5, 8, 10, 11, 12, 15, 16 Wider benefits: • preservation of natural resources, • local economy and green jobs, • social, cultural and educational Other linked LNRS Priorities: G1, G2, G3, R3, W1, SR1

[12] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

		• Green spleenwort • Dark-red helleborine • Lily-of-the-valley	
R2. Rocky outcrops and features with high biodiversity value (including outcrops, cliff faces, ledges, crevices, seepages, scree and boulders).	**R2.1** - Maintain and enhance naturally occurring biodiversity value of rocky outcrops and features, including (for example) maintaining suitable light, shade and moisture levels, grazing, scrub control and limiting disturbance as appropriate to benefit species such as bats, birds, reptiles, invertebrates, ferns, mosses, liverworts, other plants and lichens.	*Mammals:* • Bats *Reptiles* *Birds:* • Peregrine • Ring ouzel *Plants:* • Bloody crane's-bill • Green spleenwort • Hoary whitlowgrass • Hay-scented buckler-fern • *Bryum elegans* (a moss) • *Tortella squarrosa (Pleurochaete squarrosa*, a moss) *Lichens:* • 10 lichen species	National objectives and targets: 1, 2, 8, 11, 16 Wider benefits: • preservation of natural resources, • social, cultural, and educational Other linked LNRS Priorities: C3, G3, SR1
R3. Biodiversity value of geological features, rocky habitats and artificial habitats	**R3.1 -** Maintain and enhance existing biodiversity value of geological features, rocky habitats and artificial habitats arising from past industry and development, including quarries, disused railways, open mosaic on previously developed land and spoil heaps (hushings) for example, by appropriate management for the habitat type.	As above	National objectives and targets: 1, 2, 3, 8, 11, 16 Wider benefits:

arising from past industry and development is maximised.	**R3.2** - Create and maintain locally appropriate habitats on rocky substrates arising from past industry and development in suitable locations beneficial to habitat connectivity for example by creating new habitat to support shortlisted species.		• preservation of natural resources, • local economy and green jobs, • social, cultural and educational, • improve connectivity Other linked LNRS Priorities: U1, U3, U4, SR1

Wooded Habitats & Trees

Lancashire is home to a range of habitat types relating to trees and woodland. The thematic habitat of trees and woodland includes the trees, hedgerows, scrub, orchards, woodlands, wood pasture and parkland, wet woodland, and commercial forestry. However, tree and woodland cover is approximately 10.34% (2022 National Forest Inventory figures), this is below the North-West average for woodland cover (12.57%) and the England average at 14.87%.

The British Isles once supported large expanses of temperate rainforest and the species associated with them) across the western fringes including north-western England and in Lancashire upland oakwood in the Forest of Bowland and South and West Pennines) where important examples still exist. The vast majority, however, have been replaced by coniferous plantations and sheep grazed pastures. Remnant areas are small and fragmented.

Up to 40% of England's ancient woodlands have been cleared and replanted with non-native timber species[xlvi]. The way in which trees and woodland are established and managed will influence their biodiversity and the other benefits they provide[xlvii]. Lack of management of existing woodlands is leading to poor condition and replanting is often required.

Grazing by deer is one of the main pressures on existing temperate rainforests[xlviii]. With deer populations that may be higher than at any other time in the last 1000 years, and invasive grey squirrel populations increasing, strategic management approaches at a landscape scale will be needed to secure our trees, woodlands and the biodiversity they support.

Disease is also a key threat. Ash dieback, Phytophtora ramorum and Phytophora austrocedri already occur in Lancashire. Planning and managing our woodlands to increase resilience to the spread of disease and to cope with future climate will be needed to keep our trees and woodlands healthy.

Hedgerows are a feature of Lancashire's lowland farmed landscape. They provide stock proof boundaries, link habitats and provide shelter both for wildlife and farm animals. If managed sympathetically they can provide food for a range of species including pollinators and their woody structure can capture carbon, helping to reduce the impacts of climate change. And if planted in the right places, for example contouring across slopes, they can also help to slow surface water flow. However, in detailed surveys undertaken by the Pendle Hill Landscape Partnershipxlix in 2018, less than 11% hedgerows were considered species-rich and most were fragmented and defunct.

A number of community orchards are known to have been planted in recent years, including examples in Blackburn with Darwen, Lancaster, South Ribble and Wyre. However, there does not appear to be a register of either new or pre-existing orchards in Lancashire. Hence, the number, area, composition and condition of orchards in Lancashire is unknown. According to the Arnside and Silverdale AONB Management Plan 2019-2024, while some orchards are well managed, the condition of others is deteriorating and many are in need of concentrated restoration work.

Table 14: Pressures and opportunities for recovery (Wooded Habitats & Trees)

Pressures	Example Habitats Affected	Broad Species Assemblages Affected (including example species[13])	Opportunities Identified
• Climate change • Pests and diseases • Land management detrimental to biodiversity • Invasive species • Habitat loss and fragmentation • Recreational impacts	Ancient and native woodland Ancient & veteran trees Coniferous woodland Deciduous woodland (incld. lowland mixed deciduous) Hedgerows Mixed woodland Orchards Scrub Temperate rainforest (incld. upland oak/ash wood) Wet woodland Wood pasture and parkland Yew Woodland	**Woodland (Broadleaved) including ancient, damp/wet and calcareous.** 54 shortlisted species including - *Mammals:* • Pine martin • Hazel dormouse • Numerous bat species *Birds:* • Hawfinch • Willow tit • Goshawk • Pied flycatcher *Invertebrates:* • Netted carpet moth *Plants:* • Bird's-nest Orchid • Enchanter's nightshade • Dark-leaved willow • Wild service tree • *Ulota calvescens* (a cushion moss) • *Rhytidiadelphus subpinnatus* (a turf-moss) *Fungi:* • Orange chanterelle • Blackening coral fungi **Calcareous Habitat Mosaic with structural diversity** **(Rocky woodland, limestone, juniper scrub, woodland rides and coppice)** 22 shortlisted species including - *Mammals:* • Hedgehog	Increase tree and woodland cover. Integrate existing community woodlands and country parks into the surrounding landscape. Riparian planting to slow the flow, regulate water quantity and reduce water temperatures. Identify and restore traditional orchards. Establish new orchards in public open space for communities. Restock conifer plantations with native trees and manage them for nature conservation and recreation encouraging public access in these locations. Coppice management for timber production, improve structural diversity and create green jobs.

[13] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

		Invertebrates: • 4 LNRS target species (3 butterflies, 1 bee) • White-letter hairstreak butterfly • Painted pill woodlouse *Plants:* • Narrow-leaved bitter-cress • Yellow bird's-nest • Lancastrian whitebeam **<u>Riparian Woodland</u> (including riverside trees and woodland and shaded banks)** *Plants:* • Black poplar • **Yellow star-of-Bethlehem** **<u>Scrub Mosaics with structural diversity</u>** **(Grassland/Woodland), wood pasture, woodland edge/heath, early Succession (Birch Wood) and hedgerows.** 16 shortlisted species including - *Birds:* • Black grouse *Invertebrates:* • Brown hairstreak butterfly • Large red-belted clearwing moth • Broad margin mining bee • Tree snipe fly *Plants:* • Tea-leaved willow **<u>Deadwood & Litter</u>** 9 shortlisted invertebrate species including: • *Trichrysis cyanea* (blue cuckoo wasp) • *Crossocerus binotatus* (a digger wasp) • *Lasius fulginosus* (a jet ant)	

		• Lesser Sabre Comb-Horn (crane-fly) One lichen species **<u>Mixed and coniferous woodland</u>** 4 shortlisted species: • **Red squirrel** • Nightjar (bird) • **Red wood ant** • Shiny guest ant	

Table 15: Wooded habitats and trees priorities, potential measures, and associated benefits

WOODED HABITATS AND TREES			
PRIORITY	**MEASURE**	**SHORTLIST SPECIES BENEFITED[14]**	**BENEFITS**
W1. Biodiversity value of existing wooded habitats is maximised.	**W1.1** - Restore natural processes and enhance the biodiversity value of existing wooded habitats, prioritising ancient and long-established woodlands, temperate rainforest, Plantations on Ancient Woodland Sites (PAWS) and wet woodland. **W1.2** – Enhance the biodiversity value of broadleaved, mixed and coniferous plantation woodland, including: • Diversification of structure, age and species composition, • Increasing the proportion of native species, • Retaining permanent areas of broadleaved woodland, • Creation of open habitats such as rides, glades and transitional woodland edge habitats, through selective felling, coppicing and ride management to increase the extent, diversity and connectivity of understory in woodlands and limit over-shading. • Increasing standing and fallen dead wood. • Inoculating habitats with appropriate native species from suitable agreed donor sites. **W1.3** - Introduce low impact woodland management and low impact management practices including sustainably managed Continuous Cover Forestry to diversify age range and structure of woodland.	*Mammals:* • Pine martin • Polecat • Hazel dormouse • Hedgehog • Roosting & foraging bat species including (Noctule, Brown long-eared, Natterer's) *Birds:* • Hawfinch • Goshawk • Black grouse *Invertebrates:* • **Wall mason bee** • Broad margin mining bee • Large red-belted clearwing moth	National objectives and targets: 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16 Wider benefits: • Timber production, • Carbon sequestration, • Improved air quality, • health and wellbeing, • climate regulation (building resilience to climate change), • local economy and green jobs, • social, cultural, and educational Other linked LNRS Priorities:

[14] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

	W1.4 - Employ measures to minimise grazing and trampling pressure on woodland ground flora and understorey, including fencing where appropriate.	• White-letter hairstreak butterfly • Painted pill woodlouse Tree snipe fly *Plants:* • Bird's-nest Orchid • Enchanter's nightshade • Narrow-leaved Bitter-cress • Yellow bird's-nest • Tea-leaved Willow • Wild service tree • Lancastrian whitebeam • *Plagiomnium ellipticum* (moss) • *Pylaisia polyantha* (moss) *Fungi:* • Orange chanterelle • Blackening coral	AW1, AW2, AW4, P2, P3, P4, W2, U2, U3, U4
	W1.5 - Retention and appropriate maintenance of aged, ancient and veteran trees to maximise their lifespan and biodiversity value, including safe retention of dead and decaying wood and other veteran features as well as maintenance of root protection zones to prevent construction, soil compaction, cultivation/excavation and application of fertilizers and pesticides.		
	W1.6 - Restore, enhance and maintain wood pasture and parkland encouraging a diversity of: • Habitats such as open-grown trees, decaying wood and open pasture, • Tree ages including ancient and veteran trees and multiple younger generations, • Open spaces for future planting or regeneration, • Habitat structure including varied tree spacing and structurally diverse grassland, • Nectar sources, • Species associated with woodlands, decaying wood and open pasture.		
	W1.7 - Restore and expand juniper scrub including encouraging natural regeneration and appropriate planting on suitable soils.		
	W1.8 - Retain and enhance standing and fallen dead wood resources in wooded habitats to maximise biodiversity value.		
	W1.9 - Retain trees with ash dieback where considered appropriate and safe to do so. Provide adequate replacement planting where retention is not possible.		
	W1.10 - Enhance the biodiversity value of hedgerows for example: • Bring hedgerows into lifecycle management including periodic rejuvenation.		

	• Promote hedgerow management that routinely benefits wildlife such as incremental trimming and longer trimming rotations. • Lay or coppice hedgerows which have passed their peak maturity to encourage dense base regrowth and ensure another lifecycle.		
W2. Woodland and wooded habitats expanded and connected with biodiverse woodland creation and tree cover in appropriate locations on a landscape scale.	**W2.1** - Establish riparian woodland and trees along water courses, riparian corridors and floodplains, through appropriate planting or natural colonisation, where biodiversity gains and improved habitat connectivity can be achieved.	As W1 priorities. In particular: *Birds:* • Pied flycatcher • Willow tit *Invertebrates:* • Netted carpet moth *Plants:* • Dark-leaved willow • **Yellow star-of-Bethlehem** • Black poplar	National objectives and targets: 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16 Wider benefits: • Improved water quality in aquatic environment, • Watercourse infiltration, • Resilience against water quantity extremes, • Supports groundwater recharge, • Agricultural benefits for livestock (shade, shelter, browsing), • Erosion prevention, • Reduction in flood risk to local communities, • Carbon storage, • Timber production, • Climate resilience, • local economy and green jobs, • health and wellbeing
	W2.2 - Expand and enhance wooded clough habitats, through natural regeneration or appropriate planting if necessary, where biodiversity gains and improved habitat connectivity can be achieved.		
	W2.3 - Creation of new biodiverse woodlands incorporating appropriate native species.		
	W2.4 - Appropriate management of woodland verges which may be particularly valuable in aiding connectivity.		
	W2.5 Wet woodland creation in suitable locations for example: • floodplains, • post-industrial habitats, • willow crop in wetter farming, • transitional habitats between peatland and non-peatland habitats, including natural regeneration, planting of appropriate native species and potentially re-wetting of suitable woodland sites on previously drained land.		
	W2.6 - Create new wood pasture and parkland establishing a diversity of: • Habitats such as open-grown trees, decaying wood and open pasture, • Tree ages including multiple generations, • Open spaces for future planting or regeneration,		

	• Habitat structure including varied tree spacing and structurally diverse grassland, • Nectar sources, • Species associated with woodlands, decaying wood and open pasture.		• social, cultural and educational Other linked LNRS Priorities: AW1, AW2, AW4, G3, P2, P3, U1, U2, U3, U4
	W2.7 - Create appropriate semi-natural habitats to buffer, expand or connect existing woodland, incorporating natural colonisation wherever possible.		
	W2.8 - Restore and create temperate rainforest on suitable sites along Lancashire's Atlantic seaboard with precursor vegetation or where indicated by site suitability mapping.		
	W2.9 - Create biodiverse and structurally diverse locally distinctive native hedges, reinstate relic hedgerows and establish boundary trees to connect existing woodland and hedgerow networks.		

Urban Habitats (Including Infrastructure Networks)

Throughout Lancashire's long history, changes in agriculture, industry, society and the environment have had a profound and lasting influence over the landscape and urban environment[I]. Our industrial past has left us with many brownfield sites, including open mosaic habitats on previously developed land, which have considerable biodiversity value. Recent increases in housing targets and demand for housing are exerting pressure on brownfield sites for residential development.

The most important habitats in the urban group are the biodiverse open spaces within towns, cities and urban areas. Opportunities for nature recovery in the urban environment include effectively designed green and blue infrastructure. It is therefore essential that nature is at the heart of urban regeneration to create attractive, investable places that are good for people, climate, and the economy[II].

Many of the broad urban habitat types replicate those from the other habitat groups (for example, trees and wooded habitats, aquatic and wetland habitats such as ponds and canals, rocky habitats such as open sandy/stony ground). For simplicity not all of these have been repeated within the tables below. Please see the 'Species shortlisted for recovery in Lancashire' in the *Evidence and Technical Information* supporting document for the full urban species assemblage list.

Table 16: Pressures and opportunities for recovery (Urban Habitats including infrastructure networks)

Pressures	Example Habitats Affected	Broad Species Assemblages Affected (including example species[15])	Example Opportunities Identified
• Climate change • Habitat loss and fragmentation, particularly through development • Land management detrimental to biodiversity • Flood risk • Recreational impacts	Farmland enclosed by the urban environment. Open mosaic on previously developed land in urban areas (≥10,000 residents). Rivers & streams, canals & other waterways	**Brownfield** **(including open mosaic on previously developed land, disturbed ground, exposed ground, waste ground).** 31 shortlisted plant and moss species including: • Pyramidal Orchid • Bee orchid • Basil thyme • Marsh helleborine • Small cudweed	Broadleaved native trees and woodland planting. To improve the structure of park woodland to target urban heat islands in towns and cities. To create urban farms and urban nature reserves for inner city or highly urban communities. To improve engagement with local community groups for example nature focused community projects. Embed nature recovery in education in our primary and secondary schools.

[15] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

		<u>Parkland, parks, gardens, orchards, verges and flower-rich habitat.</u> 14 shortlisted species including - *Mammals:* • Hedgehog *Invertebrates:* • Moss carder bee • European Hornet *Plants:* • Small-flowered buttercup • Bladder campion *Fungi:* • Slate bolete fungi **<u>Open water</u>** **(reservoirs, ditches, ponds, canals and marginal vegetation).** 32 shortlisted species including - *Mammals:* • Water vole • Foraging bat species *Amphibians:* • Common toad *Invertebrates:* • Red-eyed Damselfly *Plants:* • Numerous pondweed species • Green figwort (plant) • *Weissia rostellata* (a moss) • *Physcomitrium sphaericum* (a moss)	Raise awareness in the value of gardens for wildlife. Raise awareness in the value of maintaining a variety of semi-natural habitats and how to incorporate management to benefit biodiversity in parks and other green spaces. Enhance green corridors and active travel routes through urban areas for example, along linear infrastructure and urban watercourses. Develop/create green spaces within the public & private estates for example, NHS, schools, colleges and universities. Incorporate/create Sustainable Urban Drainage systems

		<u>Manmade structures/buildings</u>, synanthropic 11 shortlisted species including - *Mammals:* • Numerous roosting bat species including pipistrelles, Daubenton's and whiskered bats. *Birds:* • Swallow • Swift • House martin • Starling • Peregrine falcon	

Table 17: Urban habitats priorities, potential measures, and associated benefits

URBAN HABITATS (INCLUDING INFRASTRUCTURE NETWORKS)			
PRIORITY	**MEASURE**	**SHORTLIST SPECIES BENEFITED[16]**	**BENEFITS**
U1. Suitable habitats and features created and maintained to support thriving populations of urban species important to Lancashire.	**U1.1** – Create insect-rich habitat to support swift breeding populations in Lancashire sites as part of a wider, program of landscape scale habitat restoration to support this often-urban nesting, critically declining species.	• Swifts, • Bats, • Invertebrates, • Other invertebrate predators • Invertebrate reliant species (e.g. wildflowers/vascular plants).	National objectives and targets: 1, 2, 3, 4, 5, 6, 8, 12, 13, 15, 16 Wider benefits: • health and wellbeing, • reduction in heat loss, • reduction in carbon emissions, • climate resilience, • local economy and green jobs, • attenuate water to reduce flood risk, • mitigate water quantity extremes, • social, cultural and educational Other linked LNRS Priorities: AW1, AW2, AW3, AW4, G1, G2, R3, R4, W1, W2, U2, U3, U4
	U1.2 - Create more connected pollinator wildflower-rich habitat in and through urban centres seeking connectivity to the B-Lines approach for example hedgerows, arable margins and headlands, green roofs, and with parks and gardens containing wetland features, wilder areas with native plants including tall ruderals.	*Invertebrates:* • Wool carder bee • *Stelis punctulatissima* (a bee) • *Dolichovespula media* (a wasp)	
	U1.3 - Protect existing swift nesting sites.	• Swifts	
	U1.4 - Retro-fitting nesting and roosting opportunities on existing buildings and infrastructure.	*Bats* for example: • Common pipistrelle • Soprano pipistrelle • Whiskered • Brandt's bat *Birds*	

[16] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

		for example: • Swallow • Swift • House martin • Starling	
	U1.5 - Retro-fit green roofs and brown roofs on existing buildings and incorporate green walls, roof gardens and balcony planting into new buildings.	• Bats • Birds • Invertebrates	
U2. Maximised biodiversity value of new and existing urban environments and infrastructure networks.	**U2.1** - Promote the naturalisation of watercourses including the establishment of buffer habitats in the urban environment.	*Mammals:* • Water vole • Foraging bat species *Amphibians:* • Common toad *Invertebrates:* • Red-eyed damselfly *Plants:* • Green figwort • Numerous pondweed and water-crowfoot species	National objectives and targets: 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16 Wider benefits: • Improve access to green space, • offer alternative locations to alleviate recreational impacts • health and wellbeing • local economy and green jobs, • improve water quality by intercepting diffuse pollution, • attenuating water to reduce flood risk, • mitigate water quantity extremes, • social, cultural and educational
	U2.2 - Create and enhance waterbodies, wetlands and other aquatic habitats in urban areas, considering connectivity such as garden ponds, aerial ponds, bioswales, rain gardens and biodiverse sustainable drainage systems.		
	U2.3 - Wooded habitat creation and enhancement in urban area such as orchards, street trees, micro-woods, urban woodland and hedgerows.	*Mammals:* • Hedgehog • Bats *Birds:* • Greenfinch *Invertebrates:* • European hornet	

	• *Brachychaeteuma bagnalli* (a millipede) *Plants:* • Small-flowered buttercup • Pink-flowered bramble *Fungi:* • Slate bolete fungi	Other linked LNRS Priorities: AW1, AW2, AW3, AW4, G1, G2, W1, W2, U1, U3, U4
U2.4 – Create, enhance and maintain biodiverse grassland habitats in urban areas, appropriate for the location and site conditions, taking account of ongoing land uses (e.g., old established grasslands in cemeteries) and existing ecological interest (e.g., fungi).	*Plants:* • Pyramidal Orchid • Common spotted and marsh orchids • Rough hawk's-beard • Lesser hawkbit • Bladder campion • Yellow-wort. *Fungi:* • Grassland fungi such as waxcaps and earthtongues.	
U2.5 – Maintain and enhance the biodiversity of open mosaic habitat on previously developed land.	*Plants:* • Bee orchid • Basil thyme • Marsh helleborine • Small cudweed • Sand spurrey • Quaking grass	

	U2.6 - Habitat creation and enhancement through appropriate management within urban parks, public open space, gardens, allotments, historic parks and gardens, burial grounds, cemeteries, churchyards and other religious memorial sites; for example, trees and woodland, grasslands, aquatic and wetland habitats appropriate for the location and conditions of the site.	As above *Birds:* • Peregrine falcon *Fungi:* • Grassland fungi such as waxcaps and earthtongues.	
	U2.7 - Habitat creation and enhancement through appropriate management within the public estate for example educational grounds, the NHS estate, the Crown Estate, Ministry of Defence land, complete landfill sites and local authority land; for example, trees and woodland, grasslands, aquatic and wetland habitats appropriate for the location and conditions of the site.	As above	

	U2.8 - Review and adapt existing lighting design in parks and along streets and linear infrastructure to be more wildlife friendly, whilst remaining safe and useable by people.	*Invertebrates*
		Mammals:
		• Hedgehogs
		• Bats including:
		  ○ Pipistrelle's
		  ○ Daubenton's
		  ○ Brown long-eared
		  ○ Natterers
		  ○ Whiskered
		  ○ Brandt's
		  ○ Serotine	

	U2.9 - Incorporate appropriate native habitats and species into Sustainable Urban Drainage Systems.		
U3. Increased connectivity of habitats through and between	**U3.1** - Create and enhance connected habitats (such as hedgerows, verges etc) along transport and other linear infrastructure corridors for example greener active travel routes, canal network and towpaths through appropriate management.	As above	National objectives and targets: 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 15, 16 Wider benefits:

urban landscapes.	**U3.2** - Enhance connectivity of habitats across transport and other linear infrastructure corridors and reverse the effects of severance, including for example green bridges, removal or widening of culverts, creation of underpasses, 'hop-over' planting.		• Improve access to green space, • reduction in noise pollution, • improve air quality, • health and wellbeing, • address severance, • local economy and green jobs, • social, cultural and educational Other linked LNRS Priorities: AW1, AW2, AW3, AW4, G2, G3, R4, W1, W2, U1, U2, U4
	U3.3 - Habitat creation and enhancement to connect urban habitats and green spaces to the wider ecological network, including new or enhanced stepping-stone habitats, wildlife corridors and biodiverse open spaces**.**		
	U3.4 - Create and enhance habitats to buffer the canal network for example, trees and woodland, grasslands, aquatic and wetland habitats appropriate for the location and conditions of the site.		
U4. Biodiverse publicly accessible spaces and routes.	**U4.1** - Habitat creation, enhancement and management within public open space and along active travel routes, for example trees and woodland, grasslands, aquatic and wetland habitats appropriate for the location and conditions of the site.	As above	National objectives and targets: 1, 2, 3, 4, 6, 10, 12, 15, 16 Wider benefits: • Improve air quality, • Improve water quality, • health and wellbeing • local economy and green jobs, • Improve access to green space, • social, cultural and educational Other linked LNRS Priorities: AW1, AW2, AW3, AW4, G2, W1, W2, U1, U2, U3
	U4.2 - Creation of Suitable Alternative Natural Green Spaces comprising wildlife rich woodland, grassland, wetland and aquatic habitats.		

	U4.3 - Restoration and enhancement of existing Local Nature Reserves, Country Parks and District Wildlife Sites		

Biological Heritage Sites (BHS)

Biological Heritage Sites are the best areas for biodiversity within Lancashire, outside of legally protected sites. Biological Heritage Sites are identified by the Biological Heritage Sites partnership. All sites included on the register have been assessed against robust, scientifically determined criteria within the *Biological Heritage Sites Guidelines for Site Selection*. They are some of the core sites for nature recovery in Lancashire on which our Local Habitat Map has been based and are shown on the map as Areas of Particular Importance for Biodiversity, along with statutory protected sites, district wildlife sites and statutory irreplaceable habitat.

There are currently 1,215 Biological Heritage Sites, covering a total area of 34,298 hectares. However, the BHS system is not static. Independently from the LNRS, the extent of BHSs is regularly reviewed and updated, including the addition of new areas that meet the *BHS Guidelines for Site Selection*. Although LNRS mapping will remain fixed from publication until the next review, new areas of BHS would be included as Areas of Particular Importance for Biodiversity within future iterations of the LNRS. Up to date BHS boundaries can be found here: Nature Recovery Interactive Map

Areas which have been considered and agreed by the BHS Review Panel to warrant inclusion on the BHS register, but which have not yet received higher authorisation, are known as Provisional Biological Heritage Sites. The BHS measures have also been applied to Provisional Biological Heritage Sites where it is reasonably certain that higher authorisation is imminent.

Lancashire Environmental Records Network (LERN) holds and provides data, information and site descriptions relating to the BHS system on behalf of the BHS partnership. The BHS Team (on behalf of the BHS Partnership) may also be able to provide additional information on individual sites, as well as advice based on available information and knowledge of sites gained from site assessments, to inform appropriate restoration, enhancement and conservation management. Contact details as follows:

- LERN@lancashire.gov.uk
- BHS@lancashire.gov.uk

Maintaining and enhancing Lancashire's most important non-statutory wildlife sites is central to ongoing and future nature recovery action in Lancashire. The Priority and Measures seek to encourage only those interventions which would restore, enhance and maintain the ecological interest of these sites and are informed by available information and advice.

Pressures and risks

Unlike statutory designated sites, there are no statutory requirements for BHSs to have management plans, and no obligations relating to achieving or maintaining favourable conservation status.

Identified pressures on individual habitats discussed throughout this strategy can equally apply within a BHS. There is also a risk that ill-informed or inappropriate management or interventions that do not take account of qualifying features and other ecological interest of these sites could result in damage or loss of ecological interest of particular importance in a County context.

BHSs can be complex habitat mosaics which can be difficult to map. Individual sites may be important in a County context for a number of different habitats and species with varying requirements. In line with the *BHS Guidelines for Site Selection*, a BHS may also contain important areas (such as Priority Habitat) additional to the guideline for site selection under which the site is listed. All of these factors need to be taken into account when determining appropriate restoration, enhancement and conservation management.

Although the BHS Partnership hold data and information on BHSs, for many sites this may not be in a suitable format to readily map areas under the most appropriate LNRS habitat measures. Also, the LNRS habitat measures do not always fully align with BHS Guidelines for Site Selection.

<u>Opportunities</u>
Habitat restoration, enhancement and positive conservation management of Biological Heritage Sites and/or appropriate habitat creation, restoration and enhancement adjoining these sites would support nature recovery within Lancashire's most important sites and improve habitat most likely to provide the greatest benefit for nature.

Table 18: BHS priorities, potential measures, and associated benefits –

BIOLOGICAL HERITAGE SITES (NON-STATUTORY COUNTY WILDLIFE SITES)			
Priorities	**Measures**	**Species Benefits**	**Benefits**
B1 - The ecological interest of Biological Heritage Sites is maintained and appropriately enhanced.	**B1.1 –** Habitat restoration, enhancement and positive conservation management within Biological Heritage Sites, which: • supports the qualifying features of the BHS, • maintains and enhances any irreplaceable habitats present, • supports other existing habitats and species of the site, • increases the ecological value of the site, • is informed by the BHS site description and other information available from the BHS Partnership, and • gives consideration to any available advice from the BHS Partnership.	A wide range of Lancashire species.	As Sites of Particular Importance for Biodiversity, BHS play a significant role in meeting overall national biodiversity targets. To help align action with other potential measures on the land adjoining BHS.
	B1.2 – Habitat creation, restoration and enhancement adjoining Biological Heritage Sites to benefit the ecological value of the BHS, which: • supports the qualifying features and existing ecological interest of the adjoining BHS, • is informed by the BHS site description and other information available from the BHS Partnership. • gives consideration to any available advice from the BHS Partnership.		

Target Species

24 'target species' have been prioritised for bespoke measures beyond the more general habitat creation and enhancement measures. These include some of the most scarce, declining, or important species in the County. Bespoke measures for these species often involve multiple coordinated actions to bring about recovery. By enabling the recovery of these species, the LNRS aims to contribute to the following two national environmental targets:

- *Halt the decline of species abundance by 2030. Ensure that species abundance in 2042 is greater than in 2022, and at least 10% greater than 2030.*
- *Reduce the risk of species' extinction by 2042, when compared to the risk of species' extinction in 2022.*

Where these species are a qualifying feature of a SSSI (such as hen harrier in the Bowland Fells), then species recovery measures outside of the relevant SSSI will help bolster the population and aid dispersal. This could also contribute to the relevant key additional commitment of the Environmental improvement Plan (2023) *'Restore 75% of Sites of Special Scientific Interest to favourable condition by 2042. By 31 January 2028 50% of SSSIs will have actions on track to achieve favourable condition*'.

The Priority '***SR1: Enable the recovery of scarce and declining species and other species considered to be important to Lancashire, which require bespoke species recovery measures***' and bespoke measures for these species are included in the table below.

Table 19: Target species priorities, potential measures, and associated benefits

LNRS TARGET SPECIES & BESPOKE MEASURES			
PRIORITY	**SR1: Enable the recovery of scarce and declining species and other species considered to be important to Lancashire, which require bespoke species recovery measures.**		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED[17]**	**BENEFITS**
Red squirrel (RS) National status: • GB Red List, Endangered Local status: • Lancashire Biodiversity Action Plan (LBAP) species. • BHS guideline species • Found in isolated areas which cannot sustain viable populations.	**RS1** - Protect existing red squirrel populations to maintain their current range for example, by prioritising grey squirrel management including actively managing to maintain a buffer between red and grey populations and promoting habitat best practices such as rotational thinning of older conifer trees to maintain cone productivity and creating safe spaces for red squirrels through appropriate planting. **RS2** - Improve and connect existing and suitable areas for red squirrel whilst preventing grey colonisation, for example by: • Defining expansion zones • Promote appropriate habitat management (good practice guidance for woodland and forestry) to landowners and managers in potential red squirrel areas, • Planting of favoured trees to expand existing areas and to optimise the woodland layout to increase food supply. • Avoid establishing new woodland, that would allow grey squirrels to move through the landscape.	Mammals including: • Pine marten Birds including: • Nightjar	National objectives and targets: 2 & 3 Implementing recovery measures in Lancashire could benefit and connect any populations in adjacent regions, such as Cumbria, Liverpool City Region as well as North and West Yorkshire. Other linked LNRS Priorities: W1, W2. Universal Priorities:

[17] For the full list of the 534 species that have been identified as the most threatened or locally significant to prioritise for recovery action see the *Evidence and Technical Information document – Appendix Ten*

	RS3 - Collaborate with Neighbouring LNRS Authorities (Cumbria, West/North Yorkshire and Liverpool City Region) to align actions that benefit red squirrels and contribute to a joined up and expanded network of red squirrel populations, whilst continuing to develop and implement our measures in line with the developing 'England Red Squirrel Action Plan'.		• Biosecurity and control of invasive species Supporting Actions: • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	RS4 - Conduct research into the ecology of squirrels within Lancashire to improve understanding of the dynamics between red and grey squirrels, the changes in distributions of each species and recovery needs of red squirrels within Lancashire. Such research will guide conservation actions for red squirrels at a local scale and identify the need for further action.		
	RS5 - Once appropriate grey squirrel (and squirrel pox transfer) and habitat management is in place, explore appropriate measures to facilitate red squirrel colonisation into expanded and connected sites, either through natural dispersal or reintroduction.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Atlantic salmon (AS) National status: • GB Red List, Endangered Local status: • BHS guideline species	**AS1-** Work with land managers in upper river catchments to reduce the impact of the use of Diazinon (an insecticide used in sheep dip) on nearby watercourses which has a significant impacts on olfactory function in Atlantic salmon, by ensuring sheep do not access or cross watercourses following dipping and by ensuring that they are dipped in an area which drains to tank, rather than surface water drains. This is particularly important as sheep dip tends to be applied between September and November, a time when Atlantic salmon are arriving at their spawning locations in upper river catchments, hugely increasing the risk of impacts from this chemical.	Other fish including: • Eel • Brown trout • Grayling Numerous riverine species including: • Plants • Invertebrates	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Other linked LNRS Priorities: AW2, AW4.

• Lancashire BAP species	**AS2** – River restoration in areas where salmon are known to spawn/have previously spawned to make catchments more resilient to both high and low flows and alleviate pressures caused by water quantity extremes such as the loss of redds (spawning sites) and increased mortality via exposure to extreme temperatures by delivering habitat measures to store water and slow the flow of water during high flows; and store and slowly release water during low flow periods which can also result in a loss in available habitat area for juvenile salmon and an increase in competition for habitat. **AS3** - Work to improve habitat quality in likely spawning areas to help provide a greater area of suitable spawning habitat both within the main stem of rivers and within tributaries for spawning adults for example, natural pool/riffle sequences and refugia (large wood, overhanging trees, complex habitat etc. **AS4** - Create and restore river habitat to support juvenile salmon during their various development phases. for example, by providing suitable habitat via the reintroduction of appropriately sized sediments and the introduction of refugia such as large rocks and large wood at priority sites, especially those in close proximity to known spawning locations. **AS5** - Work to improve habitat complexity for example, via the installation of large wood and boulders and the creation of complex instream habitats within lower reaches of river networks, to provide greater refugia for young salmon during their downstream migrations. This is particularly important where flow regimes are affected by drought conditions, where migration can be held up by low flows increasing the likelihood of predation. **AS6** - Improve connectivity by focussing on the removal of, or mitigation of man-made barriers across the river network (including potential installation of fish passes), a key issue for this species. Barriers include dams, weirs, fords and culverts of any height in the river network and impacts should be considered for both upstream and downstream migration.		Universal priorities: • Nutrient enrichment and pollution are minimised. Supporting Actions: • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.

	AS7 - Undertake surveys and monitoring to: • Assess watercourses within spawning range for spawning habitat availability and suitability. • Assess adult populations and population structures within all principal salmon rivers. • Assess spawning activity at known/expected spawning locations. • Assess smolt (a specific salmon life stage) escapement at a catchment scale, helping to further understand migration pathways, triggers and pressures. • Assess the impacts of water transfers on both upstream and downstream migrations (the Lune/Wyre Conjunctive Use Scheme). • Assess catchment scale impacts of barriers on the downstream migration of Atlantic salmon smolts.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Smelt (SM) National status: • UKBAP species • Species of Principal Importance Local status: • Lancashire population is of national significance • Has undergone massive declines in	**SM1 -** Make coastal catchment areas more resilient to both high and low flow through actions designed to slow the flow of water during high flow and store and slowly release during low flow to improve water quality, a key issue for this species. **SM2 -** Habitat improvements in likely spawning areas with suitable tidal regimes to provide a greater area of suitable spawning habitat within the main stem of rivers and within estuarine tributaries (for example, shallow fast flowing riffles) and refugia (for example, large wood, overhanging trees etc) for spawning adults. ***Spawning areas are only semi quantified for the Wyre so this measure is restricted in distribution at the time of writing this report. It is important to consult with specialists for potential in other catchments and useful to consider wider measures (see adjacent column).***	Other fish including: • Eel • Brown trout	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Other linked LNRS Priorities: AW2, C1, C3 Supporting Actions: • Data, evidence and strategies to inform nature

Lancashire (and the NW). Protected feature of: • Wyre-Lune MCZ • Ribble Estuary MCZ	**SM3 -** Improve connectivity within tributaries where their confluence is adjacent or downstream of the tidal limit for example, by removing, modifying or mitigating the impact of barriers within watercourses, specifically including low head impoundments (small weirs, road culverts and other bed modifications) and that prevent the occurrence of natural tidal regimes such as tidal flaps. **SM4 -** Population surveys (for example, potential for Citizen Science projects) to: • Assess watercourses within spawning range for spawning habitat availability and suitability. • Assess adult populations and population structures within coastal waters and estuaries. • Assess spawning activity at known/expected spawning locations. Assess juvenile smelt within estuaries using refined techniques based on works undertaken on River Thames.		recovery actions and the next iteration of the LNRS.
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Hen harrier (HH) National status: • GB Red List, Endangered • UK BAP Species • Species of Principal Importance Local status: • BHS guideline species	**HH1 -** Continued monitoring of breeding attempts and key winter roost sites across the County. **HH2 -** Protection of recently used nest sites for example, by ensuring deep vegetation cover for nesting is retained and burning or cutting is avoided within a buffer of 100m around nests used in the past 5 years. **HH3 -** Protection of winter roost sites by, for example: - avoiding cutting, mowing and topping in these areas, - protecting from potentially detrimental land use changes such as tree planting and wind farm developments. **HH4 -** Consider legal predator control of species that may seek to prey upon eggs and chicks at existing breeding sites.	Other birds including: • Merlin • Short-eared owl	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Other linked LNRS Priorities: P4, P5, P6 Universal Priorities:

• Lancashire BAP species • Lancashire population is of national significance. Designated feature of: • Bowland Fells SSSI (and SPA).	**HH5 -** Manage potential impacts from human activities throughout the year considering both breeding and winter roosting sites for example by, restricting recreational activities and providing information for the public.		• Access to nature is provided whilst minimising recreational impacts on sensitive sites, habitats and species populations.
	HH6 - Stop any larger scale land management operations in potential nesting areas from March to July inclusive to avoid disturbance of prospecting and nesting birds.		
	HH7 - Promote diversionary feeding at potential future nesting sites on managed grouse moors to mitigate the potential impact of hen harrier predation on grouse and the associated conflict; and support expansion of the hen harrier population.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Black-tailed godwit (BTG) National status: • GB Red List, Endangered Local status: • Lancashire BAP species • BHS guideline species. • Lancashire population is of national significance. Designated feature of: • Ribble Estuary SSSI	**BTG1 -** Erect predator exclusion fences or implement legal predator control of species that may seek to prey upon eggs and chicks at existing and potential breeding sites.	Other ground nesting birds at these sites e.g., • Redshank • Ringed plover • Pintail • Common tern	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Universal Priorities: • Access to nature is provided whilst minimising recreational impacts on sensitive sites, habitats and species populations. Supporting Actions: • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	BTG2 - Manage potential impacts from human activities during the breeding season (from March when birds are prospecting nest sites to July inclusive) at existing and potential breeding sites for example by, restricting recreational activities such as dog walking, fishing and the use of drones/UAVs and providing information for the public.		
	BTG3 - Management and enhancement of wet features at existing and potential breeding sites for example ditch reprofiling and soil spreading to retain reasonable amounts of muddy edge to feed on.		
	BTG4 - Creation of a series of wet features at potential breeding sites for example, scrapes and pools where mud is exposed for feeding ground through spring and early summer. These may need to be fed by a constant source of water for example, from a spring or stream to feed wet features in dry springs to ensure wet mud is available throughout the breeding season.		

• Ribble & Alt Estuaries and Morecambe Bay & Duddon Estuary (SPAs).	**BTG5 -** Removal of trees (ensuring appropriate consultation, assessment and compliance to avoid any detrimental impacts on other species or the habitat) at existing and potential breeding sites that may act as perches for avian predators and ensure no tree planting is undertaken in these areas.		
	BTG6 - Once predator fencing and appropriate habitat management is in place, develop project for the release of head-started birds to boost existing population numbers. Further info can be found at Project Godwit – Securing the future of black-tailed godwits in the UK.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Black-headed gull (BHG) National status: • GB Amber List. Local status: • Lancashire BAP species. • Lancashire population is of national significance. Designated feature of: • West Pennine Moors SSSI.	**BHG1** - Erect predator exclusion fences or implement legal predator control of species that may seek to prey upon eggs and chicks at existing and potential breeding sites.	Other ground nesting birds at these sites (coastal & inland) e.g., • Ringed plover • Common tern • Curlew • Dunlin	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Universal Priorities: • Access to nature is provided whilst minimising recreational impacts on sensitive sites, habitats and species populations. Supporting Actions: • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	BHG2 - Manage potential impacts from human activities during the breeding season (from March when birds are prospecting nest sites to July inclusive) at existing and potential breeding sites for example by, restricting recreational activities such as dog walking, fishing, water sports and the use of drones/UAVs and providing information for the public.		
	BHG3 - Habitat management during October – November (to avoid breeding and wintering birds) to remove any growing vegetation from the summer months before the Gull's return in March to ensure an open nesting platform is available at existing and potential breeding sites.		
	BHG4 - Manage water levels at existing breeding sites for example, to avoid flooding of nest sites during high rainfall, and predation during prolonged dry periods where water levels fall allowing predators to cross over to Island nesting sites.		
	BHG5 - Create islands on open areas of water at existing and potential breeding sites either by:		

	1. Installing rafts to provide nesting habitat, or where this is unsuitable (for example, on reservoirs where these may pose a threat to spill ways) – 2. Create islands from stone (depending on the water body depth tipping large amounts of stone can create a safe nesting site for breeding Gull's).		
	BHG6 - Monitor any growth of Lesser Black-backed Gull (and other Larus species) populations against any negative impact on Black-headed Gull colonies.		
	BHG7 - Monitor growth of growing Greylag Goose populations against disturbance and reduction of the available area for nesting Black-headed Gull colonies.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Lesser black-backed gull (LBBG) National status: • GB Amber List. Local status: • Lancashire BAP species. • Lancashire population is of national significance. Designated feature of: • Bowland Fells SSSI (and SPA)	**LBBG1** - Erect Predator exclusion fences or implement legal predator control of species that may seek to prey upon eggs and chicks at vulnerable and declining and previously known and potential nesting sites to help encourage gulls back to these locations.		Cross boundary benefits: • Contribution to North West England Gull Project www.nwgulls.org.uk (specifics tbc) Universal Priorities: • Access to nature is provided whilst minimising recreational impacts on sensitive sites, habitats and species populations. Supporting Actions:
	LBBG2 - Manage potential impacts from human activities during the breeding season (from March when birds are prospecting nest sites to July inclusive) at vulnerable and declining and historic/potential natural breeding sites for example by, restricting recreational activities such as dog walking, fishing, and the use of drones/UAVs and providing information for the public.		
	LBBG3 - Protect existing urban nesting sites from interference for example ensure no netting is erected to avoid entanglement resulting in the loss of existing nesting areas for lesser black-backed gulls.		

• Ribble Estuary SSSI • Ribble & Alt Estuaries and Morecambe Bay & Duddon Estuary (SPAs).	**LBBG4** - Habitat management during the winter to remove any growing vegetation from the summer months before the Gull's return in March to ensure an open nesting platform is available at vulnerable and declining and historic/potential natural breeding sites.		• Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	LBBG5 - Manage potential impacts from the reduction in feeding sites and the resulting increase in foraging in in-bye fields by promoting a change in livestock feeding systems for example, through careful placement of feeders and/or the use of covered feeders to discourage Gull's (RSPB, 2022 - Forest of Bowland - Gull Proof Feeder Trial Report).		
	LBBG6 - Continued monitoring of movements of breeding Lesser black-backed gulls between colonies in the northwest of England through the Natural England colour ringing scheme.		
	LBBG7 - Establish a project to identify new potential natural nesting areas for Lesser black-backed gulls to alleviate the pressures of existing colonies.		

TARGET SPECIES	MEASURE	SHORTLIST SPECIES BENEFITED	BENEFITS
Duke of Burgundy butterfly (DoB) National status: • GB Red List Vulnerable • UK BAP Species • Species of Principal Importance Local status:	**DoB1** - Work with land managers to establish management practices to enable the key food plant for this species (cowslips and primroses) to increase, suitable conditions for pupation (the transitional stage from larva to adult) to take place and connect habitats by: • Late summer and winter grazing (generally recommended) with heavy cattle/ponies to create ground disturbance opportunities for seeding into (consider 'no fence' grazing collars). • Appropriate scrub management for shelter and to facilitate connectivity.	Benefits to numerous other limestone grassland and woodland edge species including: • Harvest mouse • Northern brown argus butterfly • Dark-red helleborine • Dwarf spurge	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Supporting Actions: • Engagement and collaboration to promote nature recovery.

• BHS guideline species • Lancashire BAP species • Lancashire population is of national significance Designated feature of: • Gait Barrows SSSI • Thrang Wood SSSI.	• Cyclical cutting /disturbance of limestone grassland (to avoid a dense thatch of blue moor grass) where grazing is not possible. • Woodland ride and glade management. • Creating breeding habitat through planting larval foodplants (cowslip and primrose spp.), to maintain areas of mosaic habitat of species rich grassland, occasional tussocky limestone grasses (required for pupation), light open scrub, and bracken interspersed with limestone outcrops and connected canopy gaps.		• Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	DoB2 - Survey local populations to establish trends and conservation successes.		
	DoB3 - At known sites, monitor habitat quality and the needs of the species to further understand their decline and response to climate change to enable effective future action.		
	DoB4 - Support and encourage landowners in targeted landscapes to enter into Countryside Stewardship agreements to support appropriate management for these species.		
	DoB5 - Develop a strategy for a landscape scale habitat patch creation, including stepping-stone patches, across and between areas where multiple historic records exist.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
High brown fritillary butterfly (HBF) National status: • GB Red List, Vulnerable, • UK BAP	**HBF1** - Work with land managers to establish management practices to enable the key food plant for this species (Viola spp.) to increase, create suitable conditions in bracken litter vital for larval development and egg laying and connect habitats by: • Appropriate summer and winter grazing in bracken	Benefits to other species also requiring violets, such as: • Dark Green Fritillary • Small Pearl-bordered Fritillary	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc)

• Species of Principal Importance Local status: • BHS guideline species • Lancashire BAP species • Lancashire population is of national significance Designated feature of: • Gait Barrows SSSI • Hawes Water SSSI • Thrang Wood SSSI	• Appropriate scrub management for shelter and to facilitate connectivity. • Cyclical cutting /disturbance of bracken where grazing is not possible. • Woodland ride and glade management. • Potential trials in patch disturbance of ground to produce areas of violet germination; and • Creating breeding habitat through planting larval foodplants (Viola spp.). to maintain areas of mosaic habitat of grassland, scrub and bracken interspersed with limestone outcrops and connected canopy gaps.	Benefits to numerous other limestone grassland and woodland edge species including: • Harvest mouse • Northern brown argus butterfly • Dark-red helleborine • Dwarf spurge	Supporting Actions: • Engagement and collaboration to promote nature recovery. • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	HBF2 - Survey local populations to establish trends and conservation successes and verify new abundance and distributions to inform possible re/introductions.		
	HBF3 - Monitor habitat quality at known sites and also at nearby sites where appropriate management for the species has occurred.		
	HBF4 - Support and encourage landowners in targeted landscapes to enter into Countryside Stewardship agreements to support appropriate management for these species.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Pearl-bordered Fritillary butterfly (PBF)	**PBF1 -** Work with land managers to establish management practices to enable the key food plant for this species (Viola spp.) to increase, create suitable conditions in bracken litter		National objectives and targets: 2 & 3

National status: • GB Red List, Vulnerable, • UK BAP • Species of Principal Importance. Local status: • BHS guideline species • Lancashire BAP species • Lancashire population is of national significance Designated feature of: • Gait Barrows SSSI • Hawes Water SSSI • Thrang Wood SSSI	vital for larval development and egg laying and connect habitats by: • Appropriate summer and winter grazing in bracken • Appropriate scrub management for shelter and to facilitate connectivity. • Cyclical cutting /disturbance of bracken where grazing is not possible. • Woodland ride and glade management. • Potential trials in patch disturbance of ground to produce areas of violet germination; and • Creating breeding habitat through planting larval foodplants (Viola spp.). to maintain areas of mosaic habitat of grassland, scrub and bracken interspersed with limestone outcrops and connected canopy gaps.	Benefits to other species also requiring violets, such as: • Dark Green Fritillary • Small Pearl-bordered Fritillary Benefits to numerous other limestone grassland and woodland edge species including: • Harvest mouse • Northern brown argus butterfly • Dark-red helleborine • Dwarf spurge	Cross boundary benefits – yes (tbc) Supporting Actions: • Engagement and collaboration to promote nature recovery. • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	PBF2 - Survey local populations to establish trends and conservation successes and verify new abundance and distributions to inform possible re/introductions.		
	PBF3 - Monitor habitat quality at known sites and also at nearby sites where appropriate management for the species has occurred.		
	PBF4 - Support and encourage landowners in targeted landscapes to enter into Countryside Stewardship agreements to support appropriate management for these species.		

TARGET SPECIES	MEASURE	SHORTLIST SPECIES BENEFITED	BENEFITS
Large heath butterfly (LH)	**LH1** - Work with land managers to establish management practices at historical sites and sites with declining populations to restore sward mosaics and promote nectar plants such as crossed leaved heath by:	Umbrella species - Protecting this species indirectly protects many other species, including	National objectives and targets: 2 & 3

National status: • GB Red List, Vulnerable, • UKBAP species • Species of Principal Importance. Local status: • BHS guideline species. • Lancashire BAP species. • Lancashire population is of national significance.	• Appropriate grazing to reduce dominant thatch whilst allowing some dense tussocks for the species to overwinter in the larva form. • Combine with re-wetting techniques to enable the key food plants for this species (hare-tail cotton grass and crossed leaved heath) to increase. • Reduce or clear invasive plant species and scrub such as rhododendron, birch and self-set conifers (ensuring appropriate means in sensitive habitats). • Create breeding habitat through planting larval foodplants (hares tail cotton grass) and nectar plants (crossed leaved heat) at degraded sites and new peat restoration project sites.	other species benefitting from peatland restoration and sensitive management, for example: • Curlew • Red-eyed damselfly • Broad-leaved cotton grass	Cross boundary benefits – yes (tbc) Supporting Actions: • Engagement and collaboration to promote nature recovery. • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	LH2 - Develop monitoring project to use Large Heath as a target species to show benefits to wildlife and habitat quality at peat restoration project sites to raise water tables across large landscape areas.		
	LH3 - Survey local populations at known sites and previously recorded sites together with habitat assessments, to establish trends, monitor declines and inform conservation measures.		
	LH4 - At known sites, monitor habitat quality and the needs of the species and create a Rapid Habitat Assessment (RHA). Use this RHA to further understand widespread habitat change, population declines and response to climate change to be able to promote bigger, better and more connected action.		
	LH5 - Building on the mapped measures (LH1 - 4), develop a project building on existing knowledge to model opportunities for re/introduction measures across large areas of recent re-wetted upland Lancashire.		
	LH6 - Support and encourage landowners in targeted landscapes to enter into Countryside Stewardship agreements, to support and promote appropriate management for these species.		

	Share good practice and management options with practitioners.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Belted beauty, macro-moth (BBeau) National status: • Nationally rare. • Species of Principal Importance. Local status: • BHS guideline species. • Lancashire BAP species. • Lancashire population is of national significance **Sole-remaining English site.**	**BBeau1** - Surveys of the existing colony to inform the development of a structured land management plan to include: • Low-intensity cattle grazing of the marsh between spring and autumn. • Establishing temporary exclusion zones to assess the impact of different levels of grazing on the saltmarsh vegetation structure, coupled with larval surveys (also see BBeau2) which could inform which areas provide the best quality habitat for Belted Beauty. **BBeau2** – Establish a robust monitoring program to advise how long the existing population can survive at low abundances and the impact this might have on genetic diversity; and to help inform any future plans for habitat restoration/creation where there is currently no prospect of habitat expansion or colonisation by: • Increasing the number of transects carried out and increase the area of salt marsh covered by the transects as the saltmarsh is expanding. • Larval surveys coupled with vegetation monitoring to pinpoint the most-suitable habitat patches and exact habitat preferences, and track abundance changes over time in relation to shifts in vegetation structure.		National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Supporting Actions: • Engagement and collaboration to promote nature recovery. • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Least minor, macro-moth (LM)	**LM1** - Work with land managers to establish management practices at existing and potential sites to improve open, well-connected habitats and promote the larval food plant Blue Moor-grass by:		National objectives and targets: 2 & 3

National status: • Nationally rare (GB Red List Pre94). Local status: • BHS guideline species. • Lancashire BAP species. • Lancashire population is of national significance.	• Increasing habitat availability through scrub control, and • Introducing sheep grazing (mixed livestock or replace cattle grazing) at known sites to help promote Blue Moor-grass growth as sheep are known to selectively leave it (whereas cattle will graze it off).		Cross boundary benefits – yes (tbc) Supporting Actions: • Engagement and collaboration to promote nature recovery. • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	LM2 – Establish a robust monitoring program of vegetation, larval, and adult surveys to determine preferred vegetation structure, to establish whether unknown populations are present and whether existing populations are stable by: • Carrying out larval and adult surveys at sites with modern records (larval surveys effective at determining presence), • Survey sites with suitable habitat but without known populations, and • Larval surveys to determine whether Glaucous Sedge is used as a larval foodplant		
	LM3 - Support and encourage landowners in targeted landscapes to enter into Countryside Stewardship agreements to support appropriate management for these species.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Wall mason bee (WMB) National status: • Nationally rare (GB Red List Pre94), • UKBAP • Species of Principal Importance.	**WMB1** - Increase monitoring of key sites with historically plentiful records (Morecambe Bay), where monitoring in the past 10 years has substantially reduced in frequency and quality.	Umbrella species - protecting this species indirectly protects many other species including other species supported by acid grassland and open edge habitats with yellow legumes (such as bird's-foot trefoil), for example:	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Supporting Actions:
	WMB2 – Investigate the species composition – including key forage plants and vegetation structure – where populations have remained stable in the last ten years; and compare with non-Lancashire sites where the species is present at higher densities and note any differences.		

Local status: • Lancashire population is of national significance. • Morecambe Bay is a stronghold.	**WMB3 –** Identify key nesting sites, key foraging areas and key "lekking areas (where groups of males display to entice females)" for breeding males. **WMB4 –** Carry out meteorological analysis and atmospheric monitoring at ground level on sites with good populations and sparse populations. To help understand whether climate instability and heat spikes are having localised effects **WMB5 –** Conduct research into the effects of Ash Dieback and whether it has had a significant effect (loss of populations) on sites with previously strong populations.	• welted lesser mason bee.	• Engagement and collaboration to promote nature recovery. • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Tormentil Mining-bee (TMB) National status: • UKBAP • Species of Principal Importance. Local status: • Lancashire population is of national significance.	**TMB1** - Increase monitoring of upland areas which have never been target surveyed. **TMB2** - Carry out DNA analysis on Lancashire populations in order to be able to compare with remote populations (for example, Cornwall and European populations) to see if there are significant differences. **TMB3** - Carry out pollen analysis to verify that the species is only using tormentil (*Potentilla erecta*) and trailing tormentil (*P. anglica*) in Lancashire (records elsewhere have been noted for other *Potentilla* species).	Umbrella species - protecting this species indirectly protects many other species, including: • Tormentil nomad bee • Black-headed mining bee • Moss carder bee	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Supporting Actions: • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS. • Engagement and collaboration to promote nature recovery.

	TMB4 - When carrying out restoration of heathland and acid grassland ensure pollen specific plants tormentil and trailing tormentil are included in species mixes; and create bare sandy areas where practical.		
	TMB5 - Work with land managers to establish management practices at historical (lowland) sites and existing (upland sites with declining populations to; restore sward mosaics and promote good farming practices including vastly reduced or avoidance of nitrates; and avoid overgrazing and recreational pressures.		
	TMB6 - Re-survey lowland sites where it has seemingly, recently disappeared (in case of re-colonisation or climate instability that is not as severe a threat to the species than is anticipated)		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Bilberry bumblebee (BB) National status: • Not evaluated, • Localised and declining. Local status: • Lancashire population is of national significance.	**BB1** - Survey areas in the uplands (> 400 metres) which have either an absence of records completely or a sharp decline in the last 30 years (where suitable habitat exists)	Other upland & heathland species such as: • Twite • Ring ouzel • Broken-banded bumblebee • Northern Sallow Mining Bee • Cloudberry • Reindeer lichen	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Other linked LNRS Priorities: • P4, P5 Supporting Actions: • Engagement and collaboration to promote nature recovery.
	BB2 - When carrying out restoration of heathland and peat-based habitats in the uplands (> 400 metres) ensure nectar plants bilberry, cowberry and cranberry are incorporated into species mixes.		
	BB3 - Work with land managers to establish management practices at historical sites and sites with declining populations to; restore sward mosaics and promote good variation in heath age, retain areas of species-rich grassland and small areas of gorse, especially where these are proximal to ericaceous habitat (for example, areas with bilberry, cowberry and cranberry), avoid the use of pesticides, herbicides		
	BB4 - Organise awareness raising events for landowners and land managers with land above 400 metres, to promote the needs of the species, their declining distribution and the		

	management practises that would encourage the growth of their preferred forage plants; and to help to identify any gaps in knowledge of where this species occurs in Lancashire and its nesting requirements (which are poorly known).		• Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	BB5 - Carry out meteorological analysis and atmospheric monitoring at ground level on sites with good populations and sparse populations to see if climate instability is affecting sites differently.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Red wood ant, *Formica rufa* (RWA) National Status: • Near-threatened (GB Red List Pre94) • Localised and declining. Local status: • Lancashire population is of national significance.	**RWA1** - Investigate as to whether woodland management practices have changed where populations of this species have declined.	Shiny guest ant (lives in nests of *Formica rufa* red wood ant). Improved coniferous woodland management would also benefit species such as: • **red squirrel,** • nightjar.	National objectives and targets: 2 & 3 Cross boundary benefits – yes (tbc) Universal Priorities: • Biosecurity and control of invasive species. Supporting Actions: • Engagement and collaboration to promote nature recovery. • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.
	RWA2 - Survey larger existing populations (where nest frequency is more dense and "budding" - which is the establishment of smaller nests as part of an expansion response of a colony to growing original nest size) as part of ongoing research into the species, look to align differences in habitat structure where populations are contracting, dying out or not showing any natural tendency to "bud".		
	RWA3 - Carry out DNA analysis of the Lancashire populations as it has been suggested that they may be of hybrid origin, in which case standalone objectives centred on habitat management may need to be re-considered.		
	RWA4 - Consider pheasant control around key population areas as a significant predator of red wood ants. (This species may have been introduced from the south as a food source for pheasants which may explain why the Lancashire population is so restricted geographically and is so fragmented, isolated and declining and therefore important.) Pheasants are proven to be highly detrimental to a large range of fauna including invertebrates.		

	RWA5 - Carry out meteorological analysis and atmospheric monitoring at ground level on sites with good populations and sparse populations to see if climate instability is affecting sites and populations differently.		
TARGET SPECIES	**MEASURE**	**SHORTLIST SPECIES BENEFITED**	**BENEFITS**
Plants: **Yellow Star-of-Bethlehem (YS)** Local Status: • Rare in Lancashire. • Lancashire BAP Species. • BHS guideline species. **Northern Bedstraw (NB)** Local Status: • Rare in Lancashire. • Lancashire BAP Species. **Wood Crane's-bill (WC)** National Status: • GB Red List, Near Threatened. Local Status:	**YS1, NB1, WC1, MT1, LO1, PW1, DC1** Work with landowners at previously known or potential sites to propagate and plant to suitable areas nearby or where populations once existed; taking into account climate resilience (for example where previous or existing sites have become/may become unsuitable and by working with landowners to collect material from existing sites. **YS2, NB2, WC2, MT2, LO2, PW2, DC2** Maintain existing 'Horticultural reserves' for those species that have otherwise been lost or are at high risk of being lost as a 'cultivation stock' and create additional 'Horticultural reserves' as a fall back whereby propagation attempts can thus be carried out because natural dispersal is known to be failing in the wild (for example, The Barn (LWT) where melancholy thistle is established). **YS3, NB3, WC3, MT3, LO3, PW3, DC3** Localised surveys to establish evidence on presence / extent / distribution of local populations, to support recovery.		National objectives and targets: 2 & 3 Supporting Actions: • Engagement and collaboration to promote nature recovery. • Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.

- Scarce in Lancashire.

Melancholy Thistle (MT)

Local Status:

- Scarce in Lancashire.
- BHS guideline species.

Lady's slipper orchid (LO)

National Status:

- GB Red List, Critically Endangered.
- Nationally Rare.

Local Status:

- Rare in Lancashire.
- Species of Principal Importance.
- Lancashire population nationally significant.

Petty whin (PW)

National status:

- GB Red List, Near Threatened.

Local status:

- Rare in Lancashire.

• Lancashire BAP species. • BHS guideline species. **Dwarf cornel (DC)** National Status: • GB Red List, Near Threatened. Local Status: • Rare in Lancashire. • Lancashire population significant for England.			

Universal Priorities

Three 'universal' priorities that relate to recurring pressures across all habitats have been identified as:

- Access to nature is provided whilst minimising recreational impacts on sensitive sites, habitats and species populations.
- Nutrient enrichment, sediment deposition and pollution are minimised.
- Biosecurity (measures aimed at preventing the introduction or spread of harmful organisms) and control of invasive species.

The measures that could be taken to address these pressures have been identified in the table below. Because these are applicable universally across the county, these are not mappable. They are nevertheless important actions that, if taken, will greatly improve the chance of the LNRS priorities being achieved and will generally benefit species and habitats across the board. Where they have a specific benefit for a target species, this has been highlighted and mapped accordingly.

Table 20: Priorities, potential measures and associated benefits – UNIVERSAL PRIORITIES

PRIORITY	MEASURE	BENEFITS
Access to nature is provided whilst minimising recreational impacts on sensitive sites, habitats and species populations.	Produce and implement recreation management plans for sensitive sites and habitats to minimise disturbance and other impacts including (for example): • Undisturbed public access exclusion zones around sensitive habitats and species populations, • Seasonal access restrictions to protect breeding birds, important wintering bird populations and other sensitive species, • Designated access routes, • Interpretation materials, • Visual screens, • Prevention and control of damaging activities, • Requirements for dogs to be on leads, • Public Spaces Protection Orders and bylaws, • Rangers and enforcement officers.	National objectives and targets: • 2, 3, 6, 11 Wider benefits: • Local economy through green jobs • Social, cultural and educational • Health and wellbeing • Safeguarding natural coastal processes
	Enhance existing recreational and public open spaces to improve biodiversity, access and amenity value, to alleviate recreational pressure on sensitive sites and habitats.	
	Establish new biodiverse multi-functional open spaces accessible to all for public recreation such as new: • Sustainable forestry plantations • Other suitable alternative natural green spaces.	
Nutrient enrichment, sediment deposition and pollution are minimised.	Establish buffer zones of appropriate semi-natural habitat separating agricultural operations from water courses, water bodies, wetlands and other habitats sensitive to nutrient enrichment.	National objectives and targets: • 1, 4, 5, 9, 14, 15 Wider benefits: • Improvements in water quality, for example by intercepting diffuse pollution/filtration of pollutants.
	Establish shelter belts to minimise the impacts of ammonia and nitrogen deposition on sensitive sites and habitats, such as long-established woodlands, lowland raised mire, heathland etc.	
	Install new and improved infrastructure to: • minimise the risk of pollution input to rivers & waterbodies from all sources (such as sewage, industrial pollution, road surface run-off, domestic sources etc). • minimise the risk of nutrient input to water courses, water bodies, wetlands and other habitats sensitive to nutrient enrichment.	

	Employ measures to prevent soil erosion and silt run-off during industrial, construction, forestry and agricultural operations	• Local economy through green jobs. • Natural resources with improved soil health • Restore natural hydrology and hydro-geomorphic processes including sediment and nutrient deposition • Soil erosion prevention • Social, cultural, and educational • Health & wellbeing
	Reduce or eliminate nutrient inputs as part of landscaping, habitat enhancement and management schemes.	
	Employ pollution prevention measures during industrial, construction, forestry and agricultural operations.	
	Reduce or eliminate use of herbicides, insecticides or other pesticides during land management operations.	
	Where appropriate, employ mowing and grazing regimes as part of habitat management regimes to prevent nutrient build-up.	
	Remove arisings such as grass cuttings following management operations and seek sustainable uses for the material for example: • Haymaking • Composting • Mulch • Biochar	
Biosecurity and control of invasive species	Eradicate invasive species from: • Sensitive/important habitats and sites, • Coastal habitats • Water courses and floodplains • Transport and infrastructure corridors.	National objectives and targets: • 2, 3, 10, 11, 16 Wider benefits: • Local economy through green jobs. • Improvements in water quality. • Social, cultural, and educational. • Improve natural function and processes.
	Management of ancient and long-established woodland to remove invasive and non-native species that are detrimental to the biodiversity of the habitat.	
	Establish and implement co-ordinated landscape scale plans for management of deer and grey squirrel to facilitate successful woodland establishment and regeneration.	
	To help achieve biodiversity gains, consider legal predator control of species including mink, and those that may seek to prey upon the eggs and chicks of native natural populations of ground nesting bird species.	
	Follow guidance and information on controlling disease risk and implement biosecurity measures to prevent introduction and spread of pests and disease including: *Phytophthora ramorum, P.austrocedri, Hymenoscyphus fraxineus* (Chalara ash dieback) and Squirrel Pox Virus Disease (SQPVD)	

	Delivery of measures proposing habitat creation and enhancement should consider the risks of introducing or enabling the spread of non-native species (also see compliance).	• Restoration of coastal habitat dynamism. • Safeguarding natural coastal processes.

Supporting Actions

In addition to the mapped and unmapped measures identified for each habitat type and target species, supporting actions have been identified and agreed by stakeholders that will support and enable delivery of the LNRS priorities. They are grouped under four themes:

- Data & evidence.
- Engagement & collaboration.
- Policies that support nature recovery.
- Funding and finance for nature recovery.

These actions are above and beyond the main purpose of the LNRS (to identify locations to create or improve habitat most likely to provide the greatest benefit for nature and the wider environment). However, they are equally important in achieving our nature recovery priorities and have been informed by feedback gathered from the engagement with land managers, the VCFSE sector and the public survey, particularly around the enablers and barriers to nature friendly farming and land management practices. As with the Universal Priorities, they will generally benefit species and habitats across the board where carried out. Where they have a specific benefit for a target species, this has been highlighted and mapped accordingly.

Data, evidence and strategies to inform nature recovery actions and the next iteration of the LNRS.

- Maintain and develop the Lancashire Environmental Records Network (LERN) which has been essential in LNRS preparation and will be critical to successful delivery, monitoring and periodic review.
- Develop a State of Nature report for Lancashire which will inform future monitoring of habitats and species to assess trends and condition.
- Develop and maintain a Lancashire Habitat Inventory as an accessible repository for historic and up-to-date habitat information to fill current and future data, evidence, and monitoring needs.
- Develop a Species Data Strategy for Lancashire to direct a collaborative, consistent approach to the collection and collation of species observation data, supporting and growing biological recording networks to address existing and emerging data, monitoring and evidence needs.
- Maintain the Biological Heritage Site (non-statutory wildlife site) system.
- Develop and implement landscape scale mitigation strategies to minimise recreational and tourist pressure on sensitive habitats, nature conservation sites and species populations.
- Develop and implement landscape scale mitigation strategies to minimise the ecological impacts of nutrient enrichment, sediment deposition and pollution.

- Develop and implement landscape scale mitigation strategies to minimise the ecological impacts of invasive species.
- Develop and implement a programme of measures to identify and safeguard ancient, important and fungi-rich grasslands.
- Identify locations where biodiversity gains and wider environmental benefits can be provided through peatland restoration.
- Identify and agree suitable donor sites for seeds/plants to inoculate habitats as part of habitat restoration.
- Contribute to wider research into habitat creation, restoration and management techniques to inform future actions and approaches, focussing on knowledge gaps.
- Analyse monitoring data to identify barriers to successful habitat creation/restoration to inform future actions.
- Undertake further research to develop agreed locally appropriate seeding and planting mixes.

Engagement and collaboration to promote nature recovery

- Develop and implement a landowner engagement strategy for nature recovery.
- Develop and implement a public and community engagement strategy for nature recovery.
- Develop and implement a strategy for engagement with the commercial sector.
- Develop and implement education and training strategies for nature recovery.
- Develop and implement a consultation strategy for nature recovery.
- Establish and build upon nature recovery partnerships, including Lancashire's Local Nature Partnership (LNP) and Morecambe Bay LNP to deliver LNRS measures and Supporting Actions.

Policies that support nature recovery.

- Establish development plans and policies that support LNRS delivery, giving consideration to the following recommendations:
    - Incorporating identified nature recovery opportunities, priorities and measures into new and emerging local plans.
    - Restricting development (unless for biodiversity reasons) wherever possible on:
        - flood plains,
        - coastal habitats,
        - upland and lowland peat.
    - Ecological restoration requirements following mineral extraction.

- Support for biodiversity enhancement measures within new developments, above and beyond mandatory and national policy requirements, such as:
    - nesting and roosting opportunities within buildings and structures,
    - habitat creation on new buildings and structures,
    - wildlife shelters,
    - interconnecting habitats,
    - biodiverse sustainable drainage systems.
- Requirements for sensitive lighting.
- New nature-rich open spaces accessible for public recreation.
- Robust protection for:
    - Areas of particular importance for biodiversity identified on the local habitat map.
    - Lancashire's most important species (see *Evidence and Technical Information* document), in particular the 24 Lancashire LNRS Target Species requiring bespoke measures to support their recovery,
    - habitats that are difficult or impossible to re-create (including a local list of habitats to be agreed),
    - habitats with high carbon storage potential such as peatland and wooded habitats,
    - trees, wooded habitats and associated root protection zones, including aged and veteran trees, ancient and long-established woodlands and temperate rainforest.

Funding and finance for nature recovery.

- Establish a local strategy for funding and financing:
    - Landscape scale nature recovery projects,
    - Community nature recovery projects.
    - Research and collection of ecological data and evidence.
- Promote private and public investment in:
    - Landscape-scale ecosystem creation and restoration,
    - Community nature recovery projects,
    - Research and collection of ecological data and evidence.

3. The Local Habitat Map

The Local Habitat Map can be accessed here: Lancashire's Local Habitat Map. It shows:

Areas of particular importance for biodiversity in Lancashire.

Areas that could become of particular importance in Lancashire – these are the mapped locations for potential measures that would:

- make the greatest contribution to achieving the identified priorities.
- achieve greatest connectivity of similar biodiverse habitats across the landscape.
- make a particular contribution to other environmental benefits for the people of Lancashire, such as natural flood management or for health and wellbeing.

Connectivity modelling (connecting similar habitats based on the existing areas of particular importance) has identified new ecological networks and has informed where the potential measures have been mapped. Where a potential measure could feasibly be implemented in many locations, areas have been identified that would benefit biodiversity or the environment the most.

Where two or more potential measures could be carried out together, where different potential measures would generate similar levels of benefit, or where the most suitable measure would need to be informed by further survey on the ground, they may be mapped in the same location. Some measures could be applied widely across Lancashire and have therefore not been mapped. This includes, for example, various measures relating to sustainable land management practices and some relating to surveys, research, and monitoring. Further information on the mapping process is provided in the *Evidence and Technical Information* document.

When viewing the map please remember:

- The main purpose of the map is to identify locations to create or improve habitat most likely to provide the greatest benefit for nature and the wider environment.
- The habitat map is based on data sets and the best available information available at the time.
- The aim is not to create isolated areas but ecological networks that are bigger, better, and more connected to help nature thrive. If a site doesn't appear it is likely that connectivity opportunities were not identified as a priority in that area.
- It is a tool to identify opportunities for nature recovery, it is not intended to be a delivery plan. Landowners of areas mapped are not obliged to deliver opportunities identified.
- Identified potential measures do not preclude other land use changes. It is a 'snapshot' in time and may therefore (for example) include sites that already have planning permission or consent for other land use changes.

Before undertaking any measure, it is important to obtain the permission of the landowner, carry out any necessary surveys/assessments and obtain the required consents and approvals from any relevant public bodies. A summary of some key compliance requirements is provided in Appendix Two.

Delivery, Monitoring & Review

Delivery

The LNRS is a tool to identify opportunities for nature recovery, which can be used to target action and funding, it is not intended to be a delivery plan. The delivery of the LNRS will be a collaborative exercise involving a wide range of stakeholders. By working with partners, the aim is to strengthen partnerships, particularly with those who manage land and those involved in making regulatory decisions that will be fundamental in delivering the strategy.

Monitoring and Review

The Environment Act requires that the LNRS is reviewed and republished every 3 – 10 years. This will enable progress on delivery to be monitored and to reflect on what has been achieved and where more action is needed. The review will consider which measures have and have not been carried out since the previous published strategy, which will inform an open process of adding, removing, or amending potential measures before republishing. Areas where nature recovery action has taken place will be mapped.

LERN will have a critical role in the management of this process, including supporting monitoring responsibilities and decision making as well as developing the next iteration of the strategy. It is predicted that this role will expand with an increasing reliance on data and strategic planning.

A responsible authority may not change a published local nature recovery strategy without the written agreement of the Secretary of State in accordance with the Regulations.

Glossary

Agri-environment schemes	Agri-environment schemes are Government programmes set up to help farmers manage their land in an environmentally friendly way. Agri-environmental schemes are important for the conservation of farmed environments of high nature value, for improved genetic diversity and for protection of agro-ecosystems.
Ancient woodland	Areas of woodland that have been continuously wooded since at least 1600AD.
Biodiversity	The variety of life (abbreviation of biological diversity)
Biodiversity Net Gain (BNG)	BNG is an approach to development, and/or land management, that aims to leave the natural environment in a measurably better state than it was beforehand. It delivers measurable improvements for biodiversity by creating or enhancing habitats in association with development. BNG can be achieved on-site, off-site or through a combination of on-site and off-site measures. Biodiversity net gain - GOV.UK (www.gov.uk)
Biological Heritage Site (BHS)	Non-statutory (not controlled by law) wildlife sites of at least County significance within Lancashire.
Biosecurity	Biosecurity refers to a set of precautions that aim to prevent the introduction and spread of harmful organisms. These include non-native tree pests, such as insects, and disease-causing organisms (called pathogens) such as some bacteria and fungi.
Blue space	Blue space refers to our water environments; natural – such as rivers, lakes, streams and the sea, and built – such as marinas, canals and lidos.
Brownfield sites	Brownfield sites are defined as previously developed land that are no longer being used. This includes disused industrial estates and factories: land that has previously been altered by human activity. It does not include farmland.
Budding nest frequency	Ants reproduce in different ways depending on their colony type and how many queens there are. The most common form of reproduction is called “budding”. Budding is when a queen ant and her devoted workers leave their current nest, travel to a new site, and forms a new colony.
Calcareous grassland	Calcareous grassland is found on shallow, well-drained soils which are rich in bases (principally calcium carbonate) formed by the weathering of chalk and other types of limestone or base-rich rock or drift and is characterised by vegetation dominated by grasses and herbs.
Carboniferous	The Carboniferous Period began approximately 358.9 million years ago and ended 298.9 million years ago. Its duration of approximately 60 million years makes it the longest period of the Paleozoic Era and the second longest period of the Phanerozoic Eon. The rocks that were formed or deposited during the period constitute the Carboniferous System. The name Carboniferous refers to coal-bearing strata that characterise the upper portion of the series throughout the world.

Carbon sequestration	Carbon sequestration is the process of storing carbon in a carbon pool. It plays a crucial role in limiting climate change by reducing the amount of carbon dioxide in the atmosphere.
Catchment Based Approach (CaBA) partnerships	An inclusive, civil society-led initiative that work collaboratively with government, local authorities, water companies, businesses and local groups to maximise the natural value of our aquatic environment.
CHEGD grassland	These are waxcap grasslands. CHEGDs stands for the key fungi groups involved: spindles, club and coral fungi (Clavarioids), the waxcaps *Hygrocybe* genus (although recent DNA investigations have split up the genus), pinkgills (*Entoloma*), earthtongues (*Geoglossum* and relatives), and crazed caps (*Dermoloma* and relatives). Waxcap-grassland fungi are of conservation interest as indicators of semi-natural, mycologically-rich unimproved grasslands. They are a threatened habitat throughout the UK and Europe and the species concerned are strongly associated with unfertilised, unimproved, nutrient-poor grasslands.
Clough	A steep valley or ravine.
Coastal hinterland	The hinterland of a stretch of coast is the area directly in land behind it.
Coastal squeeze	A term that describes the loss or deterioration of natural habitats along the coast due to human activities or structures that prevent them from adapting to rising sea levels.
Co-benefit	Co-benefits are other positive things that the creation or improvement of habitat can also contribute towards such as improvements to peoples' health.
Desiccated	Dried out or dehydrated.
Diffuse pollution	The release of pollutants from a range of activities that individually may have little effect on the water environment, but at a catchment scale can have a significant impact on water quality.
District Wildlife Site	These are sites designated by district councils and unitary authorities and have various names in Lancashire. They include local wildlife sites that have been recognised as having value for wildlife.
Drumlin	An oval or elongated hill believed to have been formed by the streamlined movement of glacial ice sheets across rock debris or till.
Ecology	The science of interrelationships between organisms and their interactions with their environment.
Equitable	Giving consideration to the needs of different population groups, so that everyone has the opportunity to enjoy the same outcome.
Escarpment	A long, steep slope, especially one at the edge of a plateau or separating areas of land at different heights.
Floodplain meadows	Wildflower meadows in a floodplain managed through an annual hay cut and typically grazed afterwards.

Fluvial deposits	These are sediments that are transported and deposited by rivers in a continental environment.
Functionally extinct	Too few individuals remain to enable reproduction.
Functionally linked land	A term used to describe areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a Special Areas of Conservation (SAC)/ Special Protection Area (SPA)/ Ramsar site has been designated. These habitats are frequently used by SPA species and support the functionality and integrity of the designated sites for these features.
Greenspace	• Greenspace is an area of vegetation that is set within a landscape or townscape and may include built environment features. • Greenspace is not necessarily accessible to the public e.g., greenspaces include allotments (that are normally locked and only accessible to key holders), and golf courses (which may require club membership and or payment of a fee to access). Such greenspace has a significant role to play in the overall provision of greenspaces for recreation and enjoyment. • High quality greenspace is designed and managed to deliver its intended functions and to meet defined needs. Greenspace may be urban or rural.
Groundwater recharge	A hydrologic process, where water moves downward from surface water to groundwater. Recharge is the primary method through which water enters an aquifer (underground layer of water bearing material).
Habitat	A habitat is an environment inhabited by living organisms. There are a range of systems for classifying habitats into categories. This strategy uses the following broad categories: • Aquatic & wetlands • Coastal & estuarine • Grasslands (including agricultural land) • Lowland & upland peatland • Rocky habitats • Urban habitats • Wooded habitats & trees.
Headstarted birds	Headstarting is a conservation technique for endangered species in which young animals are raised artificially and subsequently released into the wild.
Improved pasture	Improved pasture refers to cultivated or managed areas of land that have been modified to enhance the growth of specific, desirable forage plants for grazing animals.
Irreplaceable Habitat	Habitats that would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. National Planning Policy Framework updated 12/12/24.

	Statutory irreplaceable habitats listed in Biodiversity Net Gain legislation include, for example: • ancient woodland, • ancient and veteran trees, • blanket bog, • limestone pavement, • coastal sand dunes, • lowland fen.
Kested hedgerows	Hedgerows planted on small embankments.
Limestone pavement	A limestone pavement is a natural karst landform (landform worn away by water) consisting of a flat, incised surface of exposed limestone that resembles an artificial pavement
Long established woodland	Woodland that has existed since at least 1893.
Marine Conservation Zone (MCZ)	Marine Conservation Zones are areas that protect a range of nationally important, rare or threatened habitats and species.
Mitigate	Make something bad less severe.
National Landscape	National Landscapes (designated Areas of Outstanding Natural Beauty) are on par with the UK's National Parks, each is an outstanding landscape whose distinctive character and natural beauty is safeguarded in the national interest.
National Nature Reserves (NNR)	Established to protect some of our most important habitats, species and geology, and to provide 'outdoor laboratories' for research. Most NNRs offer great opportunities for schools, specialist interest groups and the public to experience wildlife at first hand and to learn more about nature conservation.
National Planning Policy Framework (NPPF)	The NPPF is the overarching policy guideline for people trying to develop land in England.
Natural capital	The parts of nature that provide benefits to people. We depend on it for the air we breathe, the water we drink and the food we eat. It boosts our health and wellbeing. It captures and stores carbon and has a vital role to play in helping us adapt to the impacts of climate change. Natural capital is also an economic concept. It considers nature as a stock of assets, which we have to invest in.
Nature-based Solutions	Actions which support and draw on nature to provide wider environmental or societal benefits.
Neutral soils	Neutral soil is a type of soil that is neither acid nor alkaline. It has a pH range between 6.6 and 7.3. Most plants have a pH level of between 6.5 and 7, which means they need a neutral soil.

Open Mosaic Habitats on Previously Developed Land	Open Mosaic Habitats on Previously Developed Land (OMH) are found mainly in urban and formerly industrial areas and have high biodiversity value.
Peatland Carbon Code standard	The Peatland Code is a voluntary certification standard for UK peatland projects wishing to market the climate benefits of peatland restoration and provides assurances to voluntary carbon market buyers that the climate benefits being sold are real, quantifiable, additional and permanent.
Plantations on ancient woodland sites (PAWS)	Ancient woodland sites that have been converted to plantations dominated by non-native tree species. These often retain some remnant features characteristic of ASNW such as ground flora along rides or pre-plantation native trees.
Polycentric	Having more than one centre or focus
Point source pollution	Point source pollution comes from a direct specific source, for example an effluent discharge pipe.
Potential measures	Potential measures are specific practical actions to achieve priorities.
Priorities (in the LNRS)	Priorities are the end results that the strategy is seeking to achieve.
Protected Species	Species protected by legislation.
Ramsar Sites	Wetlands of international importance designated under the Ramsar Convention
Rectilinear fields	Fields with straight-lined boundaries.
Red List criteria	The IUCN Red List Categories and Criteria are a system for classifying species at high risk of global extinction.
Saline intrusion	Saline intrusion is the movement of saltwater into freshwater aquifers, which can lead to groundwater quality degradation, including drinking water sources and may have other consequences.
Semi-improved grasslands	Semi-improved grassland is a transition category between improved and unimproved grasslands that have undergone some modification through the use of, for example, fertilisers, herbicides and grazing.
Semi-natural species-rich grassland	Defined by a richness score, usually more than 15 and sometimes up to 40 beneficial vascular plant species per square metre, including grasses, graminoids (grass like plants including sedges and rushes) and broadleaf wildflowers.
Silviculture	Silviculture is the care and cultivation of woodlands (as opposed to arboriculture which is the care and cultivation of individual trees).

Sites of Special Scientific Interest (SSSI)	They are nationally designated sites of special scientific interest. SSSIs are legally protected under the Wildlife and Countryside Act 1981.
Special Area for Conservation (SAC)	Protect one or more special habitats and/or species listed in the Habitats Directive. They cover both terrestrial and marine habitats and species. Designated under the Conservation of Habitats and Species Regulations 2017.
Special Protection Area (SPA)	Internationally designated areas on land or at sea which protect vulnerable bird species in the UK. Designated under the Conservation of Habitats and Species Regulations 2017.
Species	Commonly defined as a group of similar organisms that can successfully breed to produce fertile offspring.
Statutory	Decided or controlled by law.
Strategic Significance	BNG (Biodiversity Net Gain) Strategic Significance refers to the local significance of a habitat based on its location and habitat type.
Sustainable Urban Drainage Systems (SuDS)	Environmentally friendly techniques designed to help manage and control surface water runoff.
Suitable Alternative Natural Green Space (SANG)	A Suitable Alternative Natural Greenspace (SANG) is a recreational site, created to attract residents of new developments away from designated sites that are protected for their valuable ecology and are sensitive to recreational activities such as dog walking.
Supporting Actions	Supporting actions have been identified that will support and enable delivery of the LNRS priorities. They have been grouped under four themes: • Data and evidence • Engagement and collaboration • Policies that support nature recovery • Funding and finance for nature recovery
Synanthropic	An organism that can live near, and could benefit from humans and their environmental modifications
Temperate rainforest	Temperate rainforests are wet and often have open glades, or rivers cutting through rocky gorges. The trees that grow there typically include sessile oak, birch, rowan, holly, alder, willow, and hazel. The thick cover of ferns, mosses, liverworts, and lichens which cover every surface, from the ground to boulders, crags, and even the trunks and branches. A luscious temperate rainforest once covered vast areas of the British Isles. This woodland is also known as upland oakwood, Atlantic or Celtic

	rainforest. Wistman's Wood in Dartmoor, Devon is a famous national example of upland oakwood.
Veteran tree	may not be very old, but they have significant decay features, such as branch death and hollowing. These features contribute to their biodiversity, cultural and heritage value. They are also considered statutory irreplaceable habitat. All ancient trees are veteran trees, but not all veteran trees are ancient.
Umbrella species	species whereby protecting these indirectly protects many other species.
Unimproved grassland	Unimproved grasslands are areas that have never been ploughed, reseeded or heavily fertilised and tends to be species- rich with flowers and wildlife.
Universal priorities	Universal priorities relate to recurring pressures across all habitats. • Access to nature is provided whilst minimising recreational impacts on sensitive sites, habitats and species populations. • Nutrient enrichment, sediment deposition and pollution are minimised. • Biosecurity (measures aimed at preventing the introduction or spread of harmful organisms) and control of invasive species. These priorities are applicable universally across the county and are therefore not mappable. They are nevertheless important actions that, if taken, will greatly improve the chance of the LNRS priorities being achieved and will generally benefit species across the board.
Urban heat islands	Urban heat islands are areas within the urban environment that are significantly warmer than the surrounding rural areas. The heat is generated by high concentrations of people and energy use from cars, trains and buses and heat retaining structures such as roads and buildings.
VCFSE	Voluntary Community Faith and Social Enterprise sector
Waxcap grassland	Waxcap grassland is short-sward, nutrient-poor grassland that supports a rich assemblage of larger fungi, particularly waxcaps, characteristic of such habitats. They are characterised by colourful waxcap fungi, but also include other charismatic species like the coral fungi, pinkgills and earthtongues.
Wetlands	Wetlands are areas of land that are either permanently or seasonally inundated with water, supporting species that are adapted to live there. They include a range of habitat types that are important for wildlife and people and play an important role in reducing flood risk and slowing the flow of water.
Wetter farming	Wetter farming is also known as paludiculture or high-water table farming. Wetter farming is the practice of productive agriculture on wet or re-wetted land, often peatland.
Wet woodland	Wet woodland is characterised by trees such as willows, birches and alder that thrive in poorly drained or seasonally flooded soils, such as in fens and bogs, pond and lakesides, riverbanks, and flushed hillsides.

Wood pasture	Wood pasture and parkland is land that has been managed through grazing. They can be ancient, or more recent but will contain trees growing in open pasture-land, often very old and are home to many rare and threatened species.

Appendix One: National targets and objectives

Table 1 National targets set under the Environment Act 2021

Targets
1) Biodiversity on land - Restore or create in excess of 500,000 hectares of a range of wildlife-rich habitat outside protected sites by 2042, compared to 2022 levels.
2) Biodiversity on land – Halt the decline of species abundance by 2030. Ensure that species abundance in 2042 is greater than in 2022, and at least 10% greater than 2030.
3) Biodiversity on land - reduce the risk of species' extinction by 2042, when compared to the risk of species' extinction in 2022.
4) Woodland cover - Increase total tree and woodland cover from 14.5% of land area now to 16.5% by 2050
5) Improve water quality and availability - Reduce nitrogen (N), phosphorus (P) and sediment pollution from agriculture into the water environment by at least 40% by 2038, compared to a 2018 baseline.

Table 2: Additional relevant commitments from the Environmental Improvement Plan

Objective
6) Work to ensure that everyone in England lives within 15 minutes' walk of a green or blue space
7) Restore approximately 280,000 hectares of peatland in England by 2050
8) Protect 30% of land and of sea in the UK for nature's recovery by 2030
9) Support farmers to create or restore 30,000 miles of hedgerows by 2037 and 45,000 miles of hedgerows by 2050
10) Manage our woodlands for biodiversity, climate and sustainable forestry
11) Restore 75% of Sites of Special Scientific Interest to favourable condition by 2042. By 31 January 2028 50% of SSSIs will have actions on track to achieve favourable condition.
12) Ensure delivery and management of actions and policies that contribute towards our 25YEP goals are suitable and adaptive to a changing climate
13) Make sure LNRSs include proposals for Nature-based Solutions which improve flood risk management where appropriate
14) Achieve Good Environmental Status for our seas
15) Reduce emissions of nitrogen oxides by 73% and ammonia by 16% by 2030 relative to 2005 levels
16) Reducing the rates of introduction and establishment of invasive non-native species by at least 50%, by 2030

Appendix Two: Compliance with legislation, policy, and best practice standards

In delivering LNRS priorities and measures, projects must:

Ensure compliance with legislation and statutory requirements, including (but not restricted to):

- Avoiding detrimental impacts on statutory designated sites, their qualifying features, associated species populations and functionally linked land.
- Avoiding detrimental impacts on protected species and their habitats.
- Preventing the spread of invasive species, including those listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).
- Implementation of statutory biosecurity measures.
- Completion of all relevant and necessary assessments, such as Habitats Regulations Assessments.
- Prior acquisition of all relevant and necessary permissions, consents, assent, exemptions, licences etc, including those issued by statutory consenting bodies such as Natural England, Environment Agency, Forestry Commission and Local Planning Authorities.
- Compliance with statutory environmental protection requirements, for example:
    - Environmental Impact Assessments (Agriculture) Regulations.
    - Conservation of Habitats & Species Regulations.
    - Wildlife and Countryside Act.
    - Environmental Protection Act.
- Compliance with statutory health and safety requirements.

Ensure compatibility with relevant national and local policies, local plans and associated land allocations/spatial plans.

Ensure that actions are informed by:

- Ecological data searches including consultation with the local records centre (LERN - the Lancashire Environment Record Network - Lancashire County Council), as well as open-source data,
- Appropriate baseline ecological assessments of all habitats and species groups that may be affected.
- Other necessary assessments as required, such as hydrological assessments, soil analysis etc.

Undertake appropriate consultation, giving consideration to consultation with:

- Statutory environmental protection and nature conservation bodies.
- Local Planning Authorities.
- The Local Environmental Records Centre.
- Lancashire Historic Environment Record.
- Ecological advisors.
- Landowners/tenants with an interest in the site or neighbouring land.
- The designating authority/partnership for any designated sites that may be affected, such as the Biological Heritage Sites Partnership.
- Public Health.
- Utilities companies responsible for overhead or underground infrastructure within or adjacent to the affected area.
- Authorities/organisations responsible for transport infrastructure that may be affected.
- Other relevant bodies.

Avoid detrimental impacts on and provide benefits for:

- Areas of particular importance for biodiversity identified on the local habitat map,
- Irreplaceable habitats,
- Other habitats that are difficult to replace,
- Habitats of Principal Importance (NERC Act, 2006),
- Species of Principal Importance and their habitats,
- Protected species and their habitats,
- Locally and nationally important species populations,
- Designated sites, their qualifying features and associated species populations,
- Habitats with high carbon storage potential,
- Habitats and species prioritised by the LNRS.

Follow recognised best practice guidance and standards wherever relevant and available, including guidance from statutory nature conservation and environmental protection bodies.

Deliver overall biodiversity gains, taking existing ecological value and environmental considerations into account, including habitats, features and species populations.

Ensure that woodland creation proposals do not provide grey squirrels with a pathway to known red squirrel populations.

Ensure that habitat creation and enhancement proposals comprise habitats, native species and plant communities appropriate for the location and site conditions taking account of:

- Local climate,
- Geology, soils, and topography,
- Hydrology,
- Existing habitats and land uses on the site and adjacent land,
- Native species distribution,
- Species populations and species associations,
- Competition and species interactions.

Consider habitat enhancements through adjustments to management including consideration of a non-intervention approach in locations where this would benefit the biodiversity of a site.

Seek to deliver wider environmental benefits, such as recreational and health benefits, reduced flood risk, improved air and water quality, carbon capture etc.

Ensure that necessary and appropriate establishment maintenance and long-term management of habitats is secured and provided to achieve the habitat creation/enhancement and species conservation objectives.

Implement monitoring programmes to assess the success of nature recovery projects and to inform the need for remedial measures or adjustments to maintenance and management.

Avoid detrimental impacts on historically important features.

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