Nottinghamshire & Nottingham

Local Nature Recovery Strategy

Statement of Biodiversity Priorities

DRAFT May 2025

working in partnership

Nottinghamshire County Council

Funded by UK Government

Nottingham City Council

Foreword

Text to be inserted in the final published version of the document

Executive Summary

Introduced by the Environment Act 2021, the Local Nature Recovery Strategy (LNRS) for Nottingham and Nottinghamshire is designed to enhance and restore biodiversity across the geographical county, including the seven districts and Nottingham City. As one of 48 LNRSs across England, the Nottinghamshire and Nottingham LNRS forms part of the UK Government's Nature Recovery Network, which seeks to address biodiversity loss, climate change, and public health and well-being on a national scale.

The LNRS has been developed in collaboration with other local authorities, government arms- length bodies, environmental organisations, farmers, landowners and communities, to agree priorities for nature recovery in Nottinghamshire, and propose actions in locations that will have the greatest environmental impact. Known as 'potential measures', these actions specifically target habitats and species, but also deliver wider environmental benefits such as natural flood management, cleaner air and better water quality, to improve the livelihoods of those who live in and care for Nottinghamshire.

Using local knowledge to extend, improve, and join up existing important habitats, the LNRS acknowledges what is already here (key areas such as Sherwood Forest Ancient Woodland, the Trent Valley and Sherwood Heathland), as well as identifying the creation of new areas that may become important for biodiversity in the future.

There are two main components that make up the LNRS: a written document called the 'Statement of Biodiversity Priorities' and the 'Local Habitat Map'.

Statement of Biodiversity Priorities

The Statement of Biodiversity Priorities covers the following:

1) An introduction to the LNRS containing background information on the strategy, a brief report on the state of nature, the purpose of the LNRS, how it has been prepared, and plans for future review.

2) Instructions on how to use the LNRS, with information on different user groups, links to other plans and strategies, BNG and Environmental Land Management Schemes, as well as links to wider environmental benefits.

3) A description of the strategy area looking at Nottinghamshire's National Character Areas, Geology, Topography, Hydrology, Climate, Habitats and Species of importance, and Protected Areas.

4) Anticipated pressures on nature in Nottinghamshire broken down by habitat, species and wider environmental issues, as well as broadly identified opportunities for recovery.

5) The Priorities and Potential Measures devised by stakeholders for the LNRS, broken down by habitat type and species.

6) Information on the mapping of measures and the Local Habitat Map, which explains Areas of Particular Importance for Biodiversity (APIBs), Areas that Could Become of Particular Importance for Biodiversity (ACBs), and how measures have been mapped. This section also addresses feasibility and constraints during the mapping stage.

The Local Habitat Map

The Local Habitat Map spatially demonstrates the areas that have been identified as being the most important for nature recovery in the region, including both APIBs and ACBs. The map should be used in conjunction with the written statement, to identify which priorities and potential measures identified in the LNRS apply to which locations.

Government expects that LNRSs will be used by all sectors of society to inform nature recovery efforts, from large scale projects to smaller, focused activity. Action against climate change and biodiversity loss can and should be taken wherever possible, and so the omission of an area from the LNRS does not negate its importance in recovering local nature. Outside of the LNRS there are other initiatives and actions that people can deliver to support nature, and Nottinghamshire is home to many people that already care for and protect our local environment. The LNRS is a tool to continue this work and to enhance and expand key habitats and populations of important species for generations to come.

Contents

1. Introduction

1.1 Background

Local Nature Recovery Strategies (LNRSs) are a new, England-wide system of spatial strategies established by the Environment Act 2021[1]. The main purpose of these strategies is to help reverse the ongoing decline of nature in England by establishing priorities for nature recovery, identify locations to create or improve habitat where this is most likely to provide the greatest benefit for nature and the wider environment, and in doing so contributing to the national **Nature Recovery Network.** The LNRS will also inform the delivery of mandatory **Biodiversity Net Gain (BNG)** and help to guide local planning policy for nature recovery.

Preparation of the Nottinghamshire and Nottingham LNRS has been led by Nottinghamshire County Council as **Responsible Authority**. The LNRS covers the whole geographical county including the seven districts and Nottingham City, and has been prepared with reference to relevant guidance, primarily the LNRS statutory guidance[2] and regulations[3] published by the Department for Environment, Farming and Rural Affairs (DEFRA). The LNRS takes both data and stakeholder-driven approaches to understand where the improvement and restoration of habitats will support the 'Bigger, Better, More and Joined-up' principles of the Making Space for Nature report (Lawton, 2010)[4], and aims to achieve multiple environmental benefits that nature can bring to people. It does this by being evidence-based, locally led and collaborative.

As with all of the 48 LNRSs prepared across England, the LNRS is formed of two key parts:

1. A written **Statement of Biodiversity Priorities,** which identifies the priorities for nature's recovery, and includes:
   - A description of the strategy area and its biodiversity.
   - Opportunities for recovering or enhancing biodiversity in the strategy area.
   - Proposals for potential measures to deliver the identified priorities.
2. A **Local Habitat Map**, which maps:
   - The most valuable existing areas for nature.
   - Specific proposals for creating or improving habitat for nature and wider environmental goals.

1.2 Nature is in crisis – and what can we do about it

We are in a global biodiversity crisis. A number of dangerous planetary tipping points are approaching, and biodiversity is declining faster than ever before. In the period 1970 to 2020 global wildlife populations have plummeted by 73% as measured by the Living Planet Index[5], and a million species are threatened with extinction, driven by a range of factors:

- **Changes in land use,** including as a result of urbanisation, linear infrastructure, agricultural intensification and expansion, inappropriate afforestation and land abandonment.
- **Direct exploitation,** including hunting, persecution and harvesting, and over-abstraction of water.
- **Man-made climate change,** rapidly affecting where habitats and species can exist and increasing the risk of wildfires, droughts and floods, and making extreme temperatures more likely.
- **Pollution to air and water,** altering habitats or directly killing animals and plants through their toxic effects.
- **Invasive non-native species,** altering habitats, outcompeting native species and introducing novel diseases and pathogens.

For some ecosystems, the impacts of climate change are approaching irreversibility[6], which is why it's important now, more than ever, that actions are taken to stop the decline of nature and repair existing habitats.

1 Environment Act 2021 (legislation.gov.uk)
2 Local nature recovery strategy statutory guidance (publishing.service.gov.uk) (PDFz)
3 The Environment (Local Nature Recovery Strategies) (Procedure) Regulations 2023 (legislation.gov.uk)
4 Making Space for Nature (webarchive.nationalarchives.gov.uk) (PDF)
5 Living Planet Report 2024 (wwf.org.uk) (PDF)
6 Climate Change 2023 Synthesis Report (ipcc.ch) (PDF)

1.3 Decline in nature in Britain

Nature in the UK, and more locally in Nottinghamshire, has also declined significantly in recent times. The State of Nature reports have sought to quantify the scale of nature's decline, with results indicating that:

- Wildlife in England has declined in abundance by a third (32%) on average since 1970.
- Of 8,840 species assessed, 13% are classified as threatened with extinction.
- 68% of plant species assessed have seen decreases in their distribution.
- The distributions of invertebrate species have decreased by 18% on average since 1970.
- Hazel Dormouse has declined by 51% in Britain since 2000, and Water Voles have declined by 47% in the period 1998/00 to 2016.
- In a global context, England has a Biodiversity Intactness Index (BII) score of 41%, amongst the lowest in the world (and against an average global BII of 77%).

A number of long-term national datasets also illustrate substantial declines of many species:

- Trends for the abundance of breeding birds on farmland show a decline of 61% in the period 1970 to 2022[8], and in the same period, the abundance of woodland birds declined by 37%.
- Some bird species have declined significantly in the period 1970-2018, including Turtle Dove (- 98%), Willow Tit (- 94%), Tree Sparrow (- 90%), Corn Bunting (- 89%), Spotted Flycatcher (- 88%), Little Owl (- 69%), Lapwing (- 64%) and House Martin (- 54%)[9].
- Habitat-specialist butterflies have declined in abundance by 27% and lost 68% of their distribution in the period 1976 to 2019, and amongst all species, butterflies have lost 42% of their distribution in the same period[10]

In Nottinghamshire, quantitative data is more difficult to come by, but evidence indicates that:

- The extent of heathland in Sherwood had decreased from around 23,500ha in the late 18th Century to just 1,250ha in the present day (i.e. a loss of nearly 95%).
- Only around 200ha of calcareous grassland can now be found in the county.
- Nottinghamshire has lost 97% of its flower-rich meadows since the 1930s.
- Around 10% of Nottinghamshire is covered by woodland, against a UK average of 13%.
- Just 1.6% of the county is legally protected as Sites of Special Scientific Interest, against an England average of 8.5%.
- Several species found in Nottinghamshire have become extinct in the county including the Adder, Fen Violet, Grass of Parnassus and Pearl-Bordered Fritillary.
- Species on the verge of extinction include Turtle Dove, Willow Tit and Frog Orchid.

The consequences of nature decline are extensive and affect our everyday lives. Beyond its crucial role in sustaining basic life-support systems through the supply of air, water and food, nature also significantly contributes to our overall quality of life. We depend on it not only for natural resources but also for recreation, active lifestyles, mental well-being and creative inspiration.

Some examples of the consequences of the decline in nature include:

- **Food production** - the absence of pollinators and degradation of soil quality threatens the production and quality of our food.
- **Ecosystem services** - pollination, water purification and soil fertility are affected by the loss of biodiversity, leading to increased costs of man-made water treatment and alternative systems.
- **Economic impact** - new studies have shown domestic and global damage to the environment could lead to an estimated 12% loss of GDP in the UK by 2030[11].
- **Culture and heritage** - Many of the UK's historical sites are connected to natural landscapes, and nature plays a part in traditional practices, community identities and national heritage.
- **Unknown consequences** - the effects of biodiversity loss and climate change generally are largely unknown. As nature declines, so does the planet's ability to regulate the climate. Altered carbon and nitrogen cycles will potentially lead to changes in the climate that exacerbate global warming.

7 State of Nature - England (stateofnature.org.uk)
8 Farmland species statistics (www.gov.uk)
9 The State of UK's Birds 2020 (bto.org) (PDF)
10 The State of the UK's Butterflies 2022 (butterfly-conservation.org)
11 Degradation of nature could reduce UK GDP by 12 per cent - UNEP-WCMC

1.4 Recovering nature

To maintain a liveable planet where people and nature thrive, action is required that is proportionate to the scale of the challenge, and at all levels, from global to local. The Environment Act 2021, for the first time, sets clear statutory targets for the recovery of nature in four priority areas – air quality, biodiversity, water and waste, and includes an important new target to reverse the decline in species abundance by the end of 2030. This means that the ambitions in the 25 Year Environment Plan[12] can start to become reality in the first statutory Environmental Improvement Plan (2023)[13].

The good news is that in many cases we know what we need to do to halt and reverse the declines of nature, and examples of previous projects and initiatives already recovering nature in the LNRS area can be found in Section 3. The purpose of the LNRS is to identify actions and locations where focussed, evidence-based and properly resourced activity should be prioritised at a local level, to continue to drive the recovery of nature.

1.5 The purpose of the LNRS

The ultimate purpose of the LNRS is to collectively identify locations with partners and stakeholders where the creation or improvement of habitat is most likely to deliver the greatest benefits for nature (and the wider environment). In this respect, the LNRS is a shared document, and successful delivery is dependent about actions undertaken by a wide range of stakeholders – from large organisations to individuals.

Successful implementation of the LNRS (in this phase, and following future iterations) will deliver the following:

1. **Biodiversity enhancement:** delivering the creation and restoration of habitats to support a diverse range of species, at locations where such actions will have the greatest benefit, helping to achieve local and national targets.
2. **Sustainable land management** and resource production: encouraging sustainable land use practices and resource production that benefit both the environment and local economy.
3. **Climate resilience:** mitigating and adapting to the impacts of climate change, building the resilience of our natural landscapes and the habitats and species which define them.
4. **Access and enjoyment:** improving access to natural spaces for residents, especially around the places where people live, promoting physical and mental well-being through nature-based activities.
5. **Community engagement:** fostering a stronger connection between people and nature by promoting community involvement in conservation efforts and providing educational opportunities.

12 25-year-environment-plan.pdf (publishing.service.gov.uk)
13 Environmental Improvement Plan (publishing.service.gov.uk)

1.6 How the LNRS has been prepared

The LNRS was produced with close reference to statutory guidance, as well as other supporting information (such as webinars run by Defra/Natural England). The process followed is outlined in **Figure 1** below, involving:

Step 1: Mapping of Areas of Particular Importance for Biodiversity (APIBs)

(Step 2: Mapping areas where nature recovery action has taken place – only relevant when the strategy is reviewed)

Step 3: Describing the strategy area, its biodiversity, and opportunities for recovery in a written Statement of Biodiversity Priorities

Step 4: Agreeing priorities and identifying potential measures for achieving them in a written Statement of Biodiversity Priorities

Step 5: Mapping Areas that Could Become of Particular Importance for Biodiversity (ACBs) using the information from Step 4.

The outputs from this process are a written **Statement of Biodiversity Priorities** (this document), and a **Local Habitat Map.**

Figure 1 – the process for producing the LNRS

1.7 Collaboration and stakeholder involvement

The statutory guidance and regulations provided Defra appointed 48 Responsible Authorities to lead on the development of LNRSs across England. Under the guidance, Responsible Authorities were instructed to work collaboratively with relevant Supporting Authorities and a wide range of stakeholders. Nottinghamshire County Council was formally appointed as the Responsible Authority for the production of the LNRS covering Nottinghamshire and Nottingham.

As Responsible Authority, Nottinghamshire County Council has worked closely with Supporting Authorities and other stakeholders throughout the development of the LNRS to create a comprehensive and collaborative-developed strategy. The Supporting Authorities, as per the LNRS regulations[14], are:

- Nottingham City Council
- Ashfield District Council
- Bassetlaw District Council
- Broxtowe Borough Council
- Gedling District Council
- Mansfield District Council
- Newark and Sherwood District Council
- Rushcliffe Borough Council
- East Midlands Combined County Authority
- Natural England

In addition, collaboration with a wide range of partners and stakeholders was essential for the development of a thorough and effective LNRS that reflects the needs of the area and the people that live in it, drawing on the best available data, expertise, existing strategies, and stakeholder perspectives.

As a result, the LNRS incorporates a broad range of views from professionals and local people in Nottinghamshire, using the best, most accurate data, and specialist expertise. Contributions from partners were essential to identifying Pressures and Opportunities, Priorities and Potential Measures for nature recovery in Nottinghamshire, and for mapping proposals for creating or improving habitats. Engaging with stakeholders in a variety of ways, the knowledge and views of those who will use the LNRS have been listened to and taken on board, to ensure it is well informed, has broad consensus, and is deliverable.

The stakeholder engagement events were designed to be specific for different stakeholder groups. This involved workshops, farmer engagement events and meetings, public engagement events, and an online survey in two parts, conducted following both statutory and non-statutory guidance.

A total of 104 stakeholders including planners, environmental NGOs, organisations that operate at landscape scale, green space and partnership groups, parish councils, and large landowners attended in person or online workshops. We reached out to farmers and landowners via targeted meetings and attendance at two ploughing matches. We had an LNRS stand at two public events: 85 people interacted at Nottinghamshire Day at Sherwood Forest and 121 people at the Victoria Shopping Centre in Nottingham city centre. The online survey on the Notts Nature Recovery (Participtr) platform resulted in 127 respondents to the series of questions and 85 respondents to the map-based element.

More information about our wider stakeholder engagement and consultation process can be found in the **Appendix 1.**

14 The Environment (Local Nature Recovery Strategies) (Procedure) Regulations 2023 (legislation.gov.uk)

1.8 Governance

The development of the LNRS was supported by a governance structure consisting of Political and Strategic Oversight Groups, an Advisory Group and several Working Groups, all feeding into a central programme management team at the County Council led by an LNRS Co-ordinator.

The Political Oversight Group is the Nottingham and Nottinghamshire Economic Prosperity Committee. This comprises the Leaders and Chief Executives of the County, City and District and Borough Councils. The role of this committee is to provide political oversight of the LNRS, but it does not approve the final strategy, as that role rests with the County Council as the Responsible Authority.

The Strategic Oversight Group comprises senior representatives from the Supporting Authorities and key stakeholder organisations, and provides overview and direction to the development of the strategy, ensuring fit with other strategic priorities and facilitating technical input from their organisations as required.

The Advisory Group's role is to steer the day-to-day work of the LNRS Coordinator, and provide direction to the Working Groups. It comprises representatives from the County and City Council, a representative for the district councils, as well as the Defra bodies of Natural England, Forestry Commission and Environment Agency.

Working Groups focus on specific areas of LNRS development, including Mapping & Data, Species and Communications & Engagement.

Membership of the Strategic Oversight Group and the Advisory Group is available in **Appendix 2.**

1.9 Future review

The Defra Secretary of State will tell Responsible Authorities when they must review and republish their LNRSs, which will be every 3-10 years. Responsible Authorities will therefore be required to monitor the impact of the LNRS in their local area, and review what action has been taken that delivers the strategy. As a result, Responsible Authorities will identify any new strategic priorities over time, taking account of progress made in nature recovery and changes in the local area as they arise.

2. How to use the LNRS

The ultimate purpose of the LNRS is to identify locations that partners and stakeholders have collectively identified where the creation or improvement of habitat is most likely to deliver the greatest benefits for nature (and the wider environment). The two parts of the LNRS, the **Statement of Biodiversity Priorities** (this document), and the **Local Habitat Map** (viewable at Local habitat map | Nottinghamshire County Council) should be read as a whole. The key sections of this Statement of Biodiversity Priorities are Section 5 (Priorities and Potential Measures), and Section 6 (Mapping of Measures and the Local Habitat Map).

Importantly, **the LNRS is not a delivery plan, and it does not force landowners, local authorities, or other agencies to deliver the works identified in the LNRS.** It should also be noted that **areas that are mapped in the LNRS for habitat creation or improvement do not prevent other legitimate land uses, do not place new restrictions on developing land, and do not identify areas to be given legal protection.** In summary, the LNRS aims to drive the delivery of local and national objectives for nature and the wider environment by helping to inform decisions about how land is used, and how funding may be allocated.

The LNRS also does not cover everything that is required for nature recovery. A number of issues are considered to be out of scope of the LNRS, as there are already legislative or policy mechanisms in place such as in relation to the management of legally designated sites (Sites of Special Scientific Interest) or water quality and sewage discharges.

The omission of areas, species or aspects of nature recovery from the LNRS also does not mean that these things are unimportant or should not be delivered, and does not prevent nature conservation work from taking place in areas not priorities by the LNRS (e.g. by restricting funding in areas that are not mapped). While every nature recovery effort is essential for restoration of the world we live in, the LNRS seeks to identify where these efforts are best concentrated and will have the greatest impact, and hence is essentially a prioritisation process.

The LNRS has produced a blueprint for where people and organisations can maximise the benefit of recovery work, not only to reverse the decline in biodiversity, but to improve every-day enjoyment of nature in the most effective way.

2.1 Use of the LNRS by different sectors

Various sectors, organisations and individuals will use the LNRS to inform a range of decisions. In particular:

- **Planners and developers** should use the LNRS to provide essential evidence for local plans, helping to identify where nature recovery efforts should be prioritised, and ensuring that planning decisions support local biodiversity goals and contribute to the broader Nature Recovery Network, thereby embedding nature recovery considerations into the decision-making process. The LNRS will also guide developers when choosing the location of off-site Biodiversity Net Gain (BNG) units (see also Section 2.3 'Relationship to Biodiversity Net Gain'). Importantly, the Levelling Up and Regeneration Act (2023)[15] requires local plans (including minerals and waste plans and joint spatial development strategies) to 'take account' of the relevant LNRS.
- **Farmers, landowners and land managers** can use the LNRS to help make decisions about habitat creation and improvement on their land. The LNRS may also have an impact on how government environmental schemes are applied to land.
- **Public and environmental organisations** should utilise the strategy to guide policies and decisions, direct investments and prioritise funding to deliver maximum benefits to nature recovery. In particular, LNRSs will inform how all public authorities in England meet their legal duty to conserve and enhance biodiversity (the Biodiversity Duty[16]). The duty applies to a long list of national and local government organisations as well as some private utilities such as water companies. Public authorities must understand which LNRSs are relevant to them and how they can contribute. This could be through managing areas of land that they are responsible for in a way that supports what the LNRS proposes and using the LNRS to inform relevant regulatory decisions.
- **Individuals, local groups and communities** can always play a part in nature recovery and can use the LNRS to find out which community efforts will have the most impact, and where.

15 Levelling-up and Regeneration Act 2023 - Schedule 7 (gov.uk)

16 Complying with the biodiversity duty (gov.uk)

2.2 Links to other plans and strategies

Existing plans and strategies, as well as the National Environmental Objectives (a combination of national targets set by Environment Act 2021 and additional commitments from the Environmental Improvement Plan 2023[17]), have been considered during the preparation of the LNRS, especially during identification of the Priorities; the LNRS is designed to integrate with existing plans and strategies to create a cohesive and joined-up approach to nature recovery.

2.3 Relationship to Planning and Biodiversity Net Gain

Local Nature Recovery Strategies are intended to support local planning authorities in preparing local plans that conserve and enhance biodiversity and the natural environment, and local planning authorities have a legal duty to have regard to the relevant strategy for their area. Local planning authorities should consider the priorities set out in the relevant Local Nature Recovery Strategy when determining how their local plan should contribute to and enhance the local and natural environment. Further guidance is available in the government's planning practice guidance[18], but in particular:

- **For local plan development:** "Local planning authorities should be aware of those areas mapped and identified in the relevant Local Nature Recovery Strategy and the measures proposed in them and consider how these should be reflected in their local plan. In doing so, they should consider what safeguarding would be appropriate to enable the proposed actions to be delivered, noting the potential to target stronger safeguarding in areas the local planning authority considers to be of greater importance. This will enable local planning authorities to support the best opportunities to create or improve habitat to conserve and enhance biodiversity, including where this may enable development in other locations."
- **For planning decisions:** "The Local Nature Recovery Strategy is an evidence base which contains information that may be a 'material consideration' in the planning system, especially where development plan documents for an area pre-date Local Nature Recovery Strategy publication. It is for the decision-maker to determine what is a relevant material consideration based on the individual circumstances of the case."

Biodiversity Net Gain (BNG) is a significant new approach to development, which aims to ensure that biodiversity is left in a measurably better condition after development has occurred. Importantly, a purpose of the LNRS is to help to influence the location of BNG that is delivered at off-site locations. The LNRS identifies strategic locations where biodiversity enhancements will have the most significant impacts, with the provision of off-site BNG at these locations being given a higher value in the biodiversity metric used for BNG (through the 'strategic significance multiplier'). This effectively means that less BNG needs to be provided if off-site provision is on a site identified in the LNRS (where the relevant habitat is being created or enhanced) and will incentivise developers to focus their off-site BNG in the places where it will have the biggest impact for nature recovery. For this reason, it is important that areas mapped in the LNRS are genuinely those that will have the greatest impact on nature recovery.

17 Environmental Improvement Plan 2023 (gov.uk)

18 Planning practice guidance - natural environment (gov.uk)

2.4 Relationship to Environmental Land Management schemes

The Environmental Land Management (ELM) schemes are designed to support the rural economy whilst achieving the goals of the 25 Year Environment Plan. The LNRS and ELM schemes are intended to complement each other as part of the UK's post-Brexit environment and agricultural policies. Whilst the exact details of how they will interact are being developed, both schemes share the goal of improving biodiversity and the environment. It is anticipated that the LNRS will guide local ELM funding allocation, ensuring resources are directed to areas with the greatest potential positive impact, and help identify opportunities for Landscape Recovery project proposals.

2.5 Nature-based solutions and other environmental benefits

While the LNRS seeks to identify key opportunities for nature recovery, it does so with consideration of wider environmental benefits and co-benefits ('other benefits'), and the use of nature-based solutions to restore the local area in the most sustainable way.

The other benefits that can arise from the delivery of the Priorities identified in the LNRS include:

- **Cleaner water:** Improved water quality for drinking and bathing through the creation of wetlands and better land management practices.
- **Cleaner air:** Enhanced air quality by planting trees and hedgerows, which help to filter pollutants.
- **Healthier soils:** Improved soil health for growing food and other products, such as timber and biofuels.
- **Climate regulation:** Increased carbon sequestration through the restoration of peatlands and the creation of new habitats.
- **Flood mitigation:** Reduced flood risks by restoring natural floodplains and creating wetlands.
- **Recreational opportunities:** More and better green spaces for recreation and well-being, benefiting local communities including by contributing to local culture and heritage.
- **Economic benefits:** Boosted local economies through increased inward investment, eco-tourism, sustainable land management practices and food production.
- **Educational opportunities:** Increased opportunities for environmental education and community engagement.

Nature-based solutions are actions which protect, conserve, restore and sustainably use and manage ecosystems in a way which addresses societal challenges (social, economic and environmental) whilst benefiting both people's well-being, as well as nature – they are interventions that use nature and the natural functions of healthy ecosystems to tackle some of the most pressing challenges of our time. Examples include:

- **Wetland creation:** Establishing new wetlands to enhance biodiversity, improve water quality, and provide flood protection.
- **Peatland restoration:** Restoring degraded peatlands to sequester carbon, improve water quality, and support unique wildlife.
- **Tree and hedgerow planting:** Increasing tree cover and hedgerows to enhance habitat connectivity, sequester carbon, and improve air quality.
- **Sustainable woodland management:** Managing existing woodlands sustainably to enhance biodiversity, provide timber, and support recreation.
- **Grassland restoration:** Restoring and managing grasslands to support pollinators, improve soil health, and increase biodiversity.
- **River restoration:** Re-naturalizing rivers to improve water quality, reduce flood risk, and enhance habitats for aquatic species.
- **Urban greening:** Creating green roofs, walls, and urban parks to improve air quality, reduce urban heat islands, and provide recreational spaces.
- **Agroforestry:** Integrating trees and shrubs into agricultural landscapes to enhance biodiversity, improve soil health, and increase farm productivity.
- **Pollinator habitats:** Creating and maintaining habitats specifically for pollinators to support agriculture and biodiversity.

3. Description of the strategy area

This section provides a description of the LNRS area and its biodiversity (part 1a), providing a broad overview of Nottinghamshire's geology and hydrology, topography and climate, as well as its protected areas. It then takes a more detailed look at the county's key habitats and associated species and gives consideration to the prospects for recovering these including by reference to current initiatives. Part 1b then identifies pressures on nature and broad opportunities for nature recovery in with reference to a range of evidence and other strategies.

3.1 A general description of Nottinghamshire

Nottinghamshire is a county in the English Midlands, covering some 215,933 hectares (834 square miles). Longer than it is wide, it measures around 73km north to south and 43km east to west, and is bordered by the counties of Lincolnshire, Leicestershire, Derbyshire and South Yorkshire. The main urban areas are Greater Nottingham in the south, Mansfield, Sutton-in-Ashfield and Kirkby-in-Ashfield in the west, Worksop and Retford in the north, Newark in the east, and Ollerton and Southwell in the centre. The human population of the County and City totals around 1,148,500 (2021 census figures).

Typical for a lowland county dominated by farmland, Nottinghamshire's habitats are generally small and fragmented, but the Sherwood Forest area at the county's heart continues to support important concentrations of heathland, acid grassland and oak-birch woodland, whilst relatively large wetlands, many the result of quarrying, occur in the Trent, Idle and Erewash Valleys. A cluster of diverse, ash-dominated woodlands are found in a central swathe, small areas of calcareous grassland are found along the boundary with Derbyshire, and peatland habitats can be found in the north of the County. Elsewhere, there remain many gems to be found – species-rich grasslands, ponds, ancient hedgerows and veteran trees – indicative of a time when these habitats were far more widespread in the county.

3.1.1 National Character Areas

The county supports a range of lowland habitats, which are a product of interactions between the underlying geology, overlying hydrology, climate, and human activities. National Character Areas (NCAs) are a useful starting point for providing a general description of the county. These are areas identified by Natural England that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries. Seven NCAs cover Nottinghamshire in substantial part, as shown in **Figure 2.**

The **Nottinghamshire, Derbyshire and Yorkshire Coalfield** (NCA 38) is a landscape of rolling ridges and escarpments, with a mixed pattern of pastoral and mixed farming, former coal-mining areas (restored pit tips and opencast workings), and urban development, which includes Kimberley and Eastwood, the western suburbs of Nottingham, as well as smaller settlements. Fragmented semi-natural habitats are dispersed through the area, and include woodlands, grassland, and wetlands, the latter particularly associated with the Erewash valley.

The Southern Magnesian Limestone (NCA 30) is an elevated ridge with a rolling landform, containing intensively farmed arable land, well-wooded estates and designed parklands. Semi-natural habitats, influenced by the underlying geology, include calcareous grasslands and ash-dominated woodlands. A legacy of coalmining is prevalent, with restored colliery pit tips throughout the NCA. The southern part contains the major population centres of Hucknall, Annesley Woodhouse, Kirkby-in-Ashfield, and Sutton-in-Ashfield; the northern part is more rural and includes the large villages of Carlton-in-Lindrick and Langold.

Sherwood (NCA 49) is a gently rolling, well-wooded landscape with a mosaic of broad-leaved, mixed and coniferous woodlands and arable farmland. Large country houses with parklands and lakes are a particular feature, as are colliery pit tips (restored or undergoing restoration). Other semi-natural habitats are relatively well represented, with areas of heathland and acid grassland. Much of the area, particularly to the north, is rural and sparsely populated with scattered villages, contrasting with the larger population centres of Worksop, Retford, Market Warsop, Mansfield, Ollerton, and much of Greater Nottingham, around the fringes of the NCA.

The **Humberhead Levels** (NCA 39) is a largely flat, low-lying and open landscape, with a long history of drainage and water management. Fertile peatland soils make the NCA a highly productive arable farming area, and semi-natural habitat is scattered and fragmented; small areas of washlands persist along the River Idle, where sand and gravel extraction has also resulted in the creation of new waterbodies and wetland, whilst woodland cover is increased on elevated land in the southern part of the NCA. The area is relatively sparsely populated with scattered villages, but includes the larger settlements of Harworth, Bircotes, Blyth and the northern parts of Retford.

The **Trent Valley Washlands** (NCA 69) is a narrow, low-lying landscape covering the River Soar floodplain and part of the River Trent floodplain. The NCA supports both pastoral and arable farming, the former on wetter or lower-lying ground, and includes suburbs of Greater Nottingham. Woodland cover is low, but riparian trees are an important landscape feature. Small wetlands persist, with new wetland created through sand and gravel extraction.

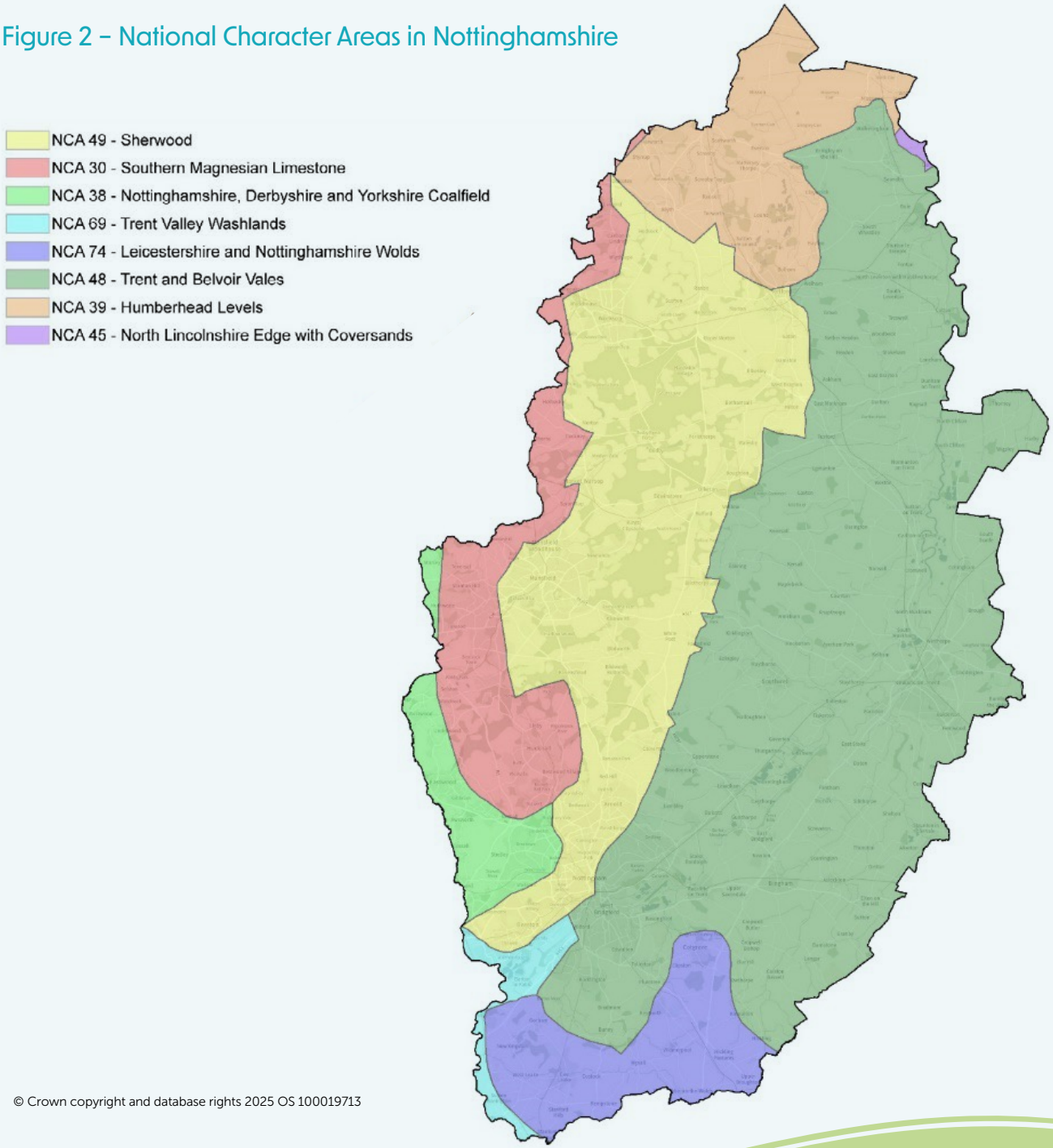
The **Trent and Belvoir Vales** (NCA 48) is a large, gently undulating rural area, the eastern part of which is dominated by the Trent Valley, with elevated and more wooded land to the west. The principal land use is arable farming, and although much grassland has been converted to arable use, pockets of pasture remain including floodplain grassland. Coverage by semi-natural habitats is generally low, but sand and gravel extraction along the River Trent has resulted in the creation of large new waterbodies and associated wetlands, and small areas of acid grassland occur in a few locations. The NCA is populated with scattered villages, as well as the eastern and southern parts of Greater Nottingham and the smaller towns of Radcliffe-on-Trent, Bingham, Southwell, Newark and Tuxford.

The Leicestershire and Nottinghamshire Wolds (NCA 74) is a rolling rural landscape of undulating hills, with low lying vales and escarpments. Semi-natural habitat cover is diminished by agricultural land use, which is a mix of arable and pastoral, with relatively extensive areas of grazing land. Concentrations of woodland occur in places along escarpments, although overall cover is low. Settlements are predominantly scattered villages, with the larger settlements of Cotgrave, Keyworth and East Leake.

An eighth NCA, the **North Lincolnshire Edge with Coversands** (NCA 45), also covers part of Nottinghamshire. However, the area involved, between Gainsborough and Beckingham, is very small (less than 3km2) and locally indistinguishable from adjacent areas in the Trent and Belvoir Vales.

Further details about Nottinghamshire's NCAs can be found at: National Character Area Profiles (nationalcharacterareas.co.uk).

Figure 2 – National Character Areas in Nottinghamshire

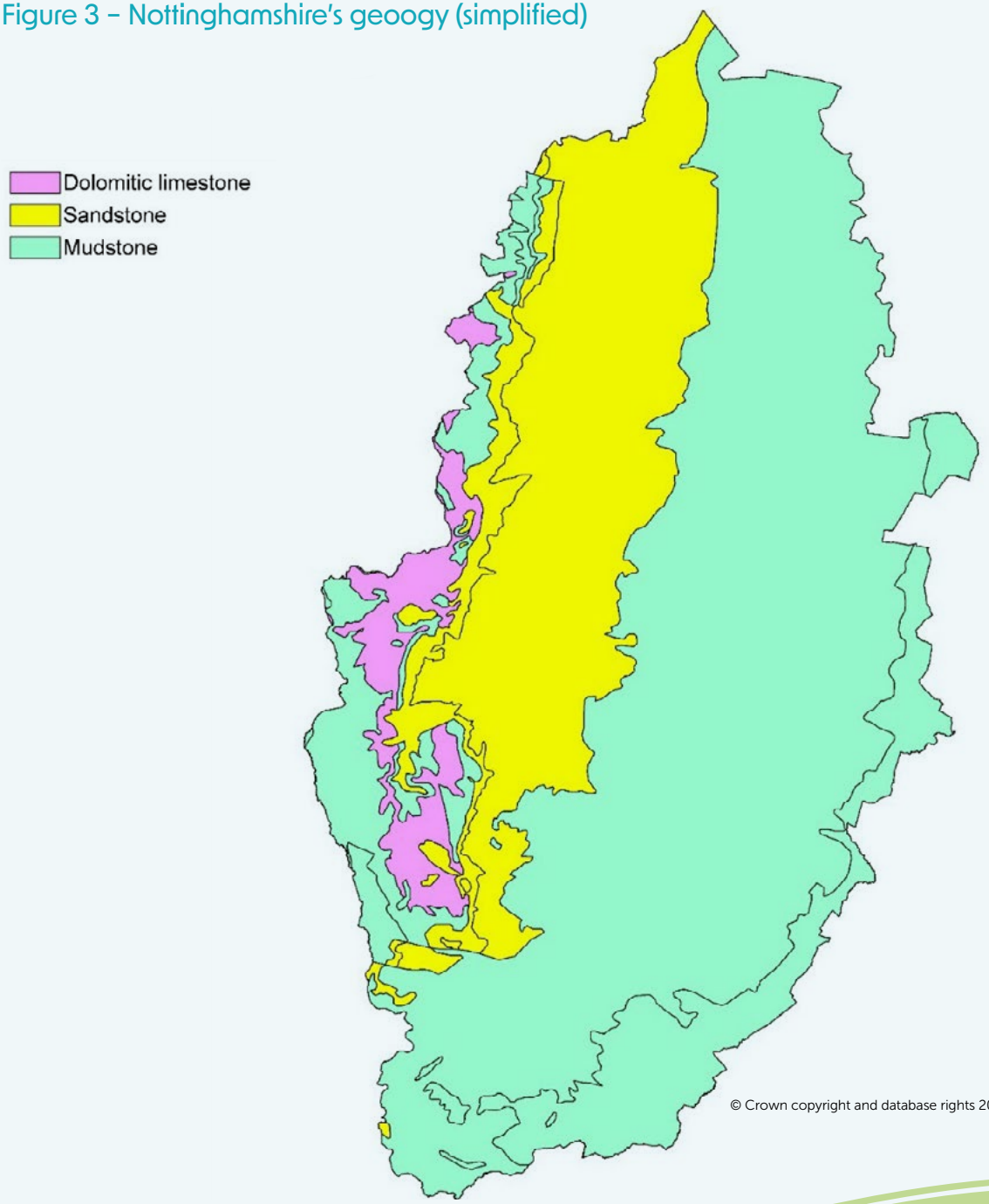


3.1.2 Geology and hydrology

The bedrock geology of Nottinghamshire directly affects what habitats are found where, and in broad terms, consists of a succession of rock formations arranged in a north-south orientation, with the oldest in the west and the youngest in the east. Very simply, the progression from west to east is mudstone, dolomitic limestone, sandstone and mudstone. These crop out in a series of belts, as shown in **Figure 3**, with each successive formation dipping gently eastwards. There are complications to this arrangement that result from folding, faulting and overstep, and in some places the bedrock is concealed beneath a veneer of superficial deposits of Glacial and Recent age including peat, alluvial sand and gravels and aeolian (wind-blown) sands.

Nottinghamshire's hydrology is dominated by the River Trent, which follows an arching course through Nottinghamshire from the south-west to the north-east and is fed by a number of major and minor tributaries including the Rivers Erewash, Soar and Leen near Nottingham, and the River Devon near Newark. Further north, the Rivers Maun, Meden and Poulter join near Retford to form the River Idle, which is then joined by the River Ryton further downstream, with the Idle then discharging into the Trent in the far north of the county.

Figure 3 – Nottinghamshire's geoogy (simplified)



3.1.3 Topography

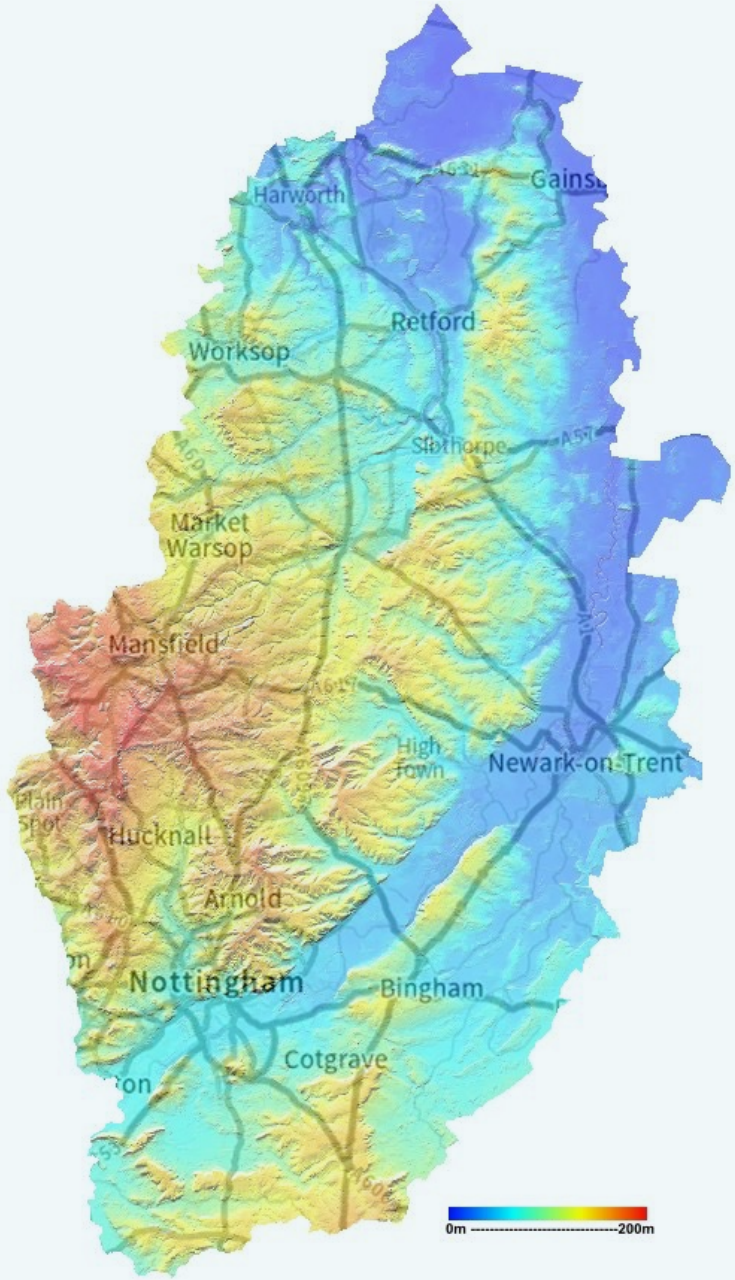
Lacking the upland landscapes of the neighbouring county of Derbyshire to the west, Nottinghamshire has a more modest topography, borne out of its underlying geology and overlying hydrology, as shown in **Figure 4**. Low lying areas are associated with the floodplains of the county's main rivers in the east and north; the Trent and Idle. From the county boundary with Derbyshire, through Nottingham and as far north as East Stoke, the Trent floodplain is rather narrow and well demarcated by relatively steep bluffs on both sides. Beyond East Stoke, the floodplain broadens widely to the east into Lincolnshire, studded with slightly elevated areas around Newark, and becomes less well defined to the west.

In the north-east of the county, the Trent Valley is joined by the Idle Valley from the west and is partly separated from it by a ridge of higher land running north as far as Gringley-on-the-Hill. Together with the Humberhead Levels, which extend from South Yorkshire into the north of Nottinghamshire, this forms an extensive low-lying area, with the lowest point in the county occurring in the furthest northern reaches at Peat Carr, where the land is at 0m above sea level.

The centre of the county sits above the Trent and Idle floodplains, and has a gentle rolling character, shaped by numerous small watercourses. Further to the west, the land rises towards the county boundary with Derbyshire, reaching its highest point at 205m above sea level to the north of Huthwaite, just west of Whiteborough Farm, immediately adjacent to the Derbyshire boundary. Nearby, the artificial spoil mound at Silverhill reaches 204m above sea level, with other colliery spoil mounds providing additional areas of artificially high ground, primarily in the west of the county.

To the south of the Trent, the Nottinghamshire Wolds form an area of higher ground up to the Leicestershire boundary, with lower lying areas at Ruddington Moor, along the River Soar, and in the floodplain of the Devon.

Figure 4 – Nottinghamshire's topography



3.1.4 Climate

Lying centrally within England, the Midlands region (within which Nottinghamshire sits) has a climate that is intermediate between Wales and eastern England in terms of rainfall and between northern and southern England in terms of temperature. Lacking a coastline, and hence not being subject to the moderating effects that the sea has on climate, the region has a more pronounced annual temperate range than most other parts of the UK, with occasional very hot summer days and frequent hard winter frosts.

Being located away from the Atlantic, the region is one of the more sheltered parts of the UK. With most rainfall arriving with Atlantic depressions from the west, Nottinghamshire lies in the rain shadow of the Derbyshire Peak District. Nevertheless, widespread flooding, caused by periods of prolonged rainfall, occurs periodically, especially in winter and early spring when soils are already close to saturation. Recent severe flooding events in the Trent Valley occurred in late October and early November 2000 following the wettest autumn on record when over twice the normal rainfall was recorded. Similarly severe flooding occurred in January 2024 following the second wettest winter on record, with record river levels exceeded in some places.

Man-made climate change is already affecting Nottinghamshire's climate. Record hot temperatures were recorded across the UK on 19 July 2022[19], when notably a weather station at Gringley-on-the-Hill recorded a temperature of 40.1°C. This exceeded the previous UK record by 1.4°C and was 18.5°C hotter that the July 1991-2020 long term average. By the end of the 21st Century, climate projections predict that Nottinghamshire is expected to:

- Be warmer, with hot summers more common, an increase in the number and the temperature of hot summer days and an increase in the frequency of hot spells.
- Experience an increase in precipitation extremes and in the intensity of heavy summer rainfall events, and more rainfall in the autumn.
- Experience a decrease in soil moisture during the summer, and a significant reduction in lying snow during the winter.

19 Met Office - July 2022 heatwave (metoffice.gov.uk)

3.2 Protected areas

3.2.1 Designated sites

Nottinghamshire's most important wildlife habitats are covered by a range of nature conservation designations, offering varying degrees of protection. These are all shown on the Local Habitat Map as Areas of Particular Importance for Biodiversity (APIBs):

Special Areas of Conservation (SACs) are internationally important sites subject to strict legal protection. Nottinghamshire has a single SAC, Birklands and Bilhaugh[20], which was designated in 2005 and extends to 272 hectares. The site covers two areas of the historic core of Sherwood and is designated for its oak-dominated woodland habitat, classified as the Annex I habitat 'Old acidiphophilous oak woodlands with Quercus robur on sandy plains'. It is the most northerly of only four SACs designated in the UK for this habitat type. It is particularly notable for its population of ancient standing oaks, as well as its invertebrate and fungal assemblages, but it also supports an important breeding bird assemblage. In addition, and although lying outside Nottinghamshire, the Humber Estuary SAC, Special Protection Area (SPA) and Ramsar Site is affected by activities in Nottinghamshire due to the direct links through the River Trent.

National Nature Reserves (NNRs) are legally designated sites of national importance, protecting the best examples of a particular habitat. They must be managed appropriately to retain their special status, and whilst their main purpose is the conservation of their important habitats and species, they also provide opportunities for the public to enjoy and engage with nature. Sherwood Forest NNR[21] is Nottinghamshire's only such site, covering 424 hectares and including Budby South Forest and the adjacent area of Birklands to the south. The site supports a range of habitats, principally heathland, acid grassland and oak-birch woodland (wood pasture).

Sites of Special Scientific Interest (SSSIs) are nationally important, legally protected sites, which represent the finest sites for wildlife and natural features in Britain. There are currently 67 SSSIs wholly or partly in Nottinghamshire[22] of which 3,333[23] hectares falls within the LNRS boundary, equating to approximately 1.5% of the county, comparing with a figure of just under 8.5% for England as a whole. At the time of writing, 89.6% of the county's SSSIs are in 'target condition' (i.e. in 'favourable' or 'unfavourable recovering' condition), compared with a figure of 93.8% in the East Midlands and 85.8% nationally. Most of Nottinghamshire's SSSIs are designated for their biological interest, principally based on the particular habitats that they support.

The county has 69 **Local Nature Reserves** (LNRs)[24], legally designated by local authorities, which support wildlife or geological features that are of special interest locally and offer people opportunities to study or learn about nature, or simply to enjoy it. They cover 1266.3 hectares of the county, equating to 1.1 hectares of LNR per 1000 head of population at a county level.

Local Wildlife Sites (LWS), previously known in Nottinghamshire as Sites of Importance for Nature Conservation (SINCs), are sites that have been identified as being of at least county-level importance for their wildlife. They are a local, non-statutory designation, with sites selected based on a set of agreed criteria and used principally in relation to land-use planning and development. As of May 2024, there are 1,466 LWSs in Nottinghamshire, covering 18,705 hectares or around 8.7% of the county. Such sites can be designated under criteria covering habitats and a range of species groups. The management of Local Wildlife Sites is assessed as part of the Government statistic 'National Data List 160', with data from 2018-19 (the most recent year data is available for) indicating that 23.1% of LWSs in Nottinghamshire were under positive conservation management.

20 Birklands and Bilhaugh - Special Areas of Conservation (jncc.gov.uk)
21 Nottinghamshire's National Nature Reserve - GOV.UK (www.gov.uk)
22 Nottinghamshire SSSI list (naturalengland.org.uk)
23 This is the area of SSSI falling wholly within Nottinghamshire, and excludes those parts of SSSIs which fall into neighbouring counties.
24 Nottinghamshire LNR list (naturalengland.org.uk)

3.2.2 Other sites

Parts of Sherwood are identified as a **Key Biodiversity Area** (KBA)[25] due to their important populations of Nightjar and Woodlark – KBA's being recognised as the most important places in the world for their species and habitats. Much of the KBA is covered by SSSI or LWS designations, but some parts are undesignated. The site is effectively treated as if it were designated as a Special Protection Area (SPA) in local planning policy following Natural England's advice that a 'risk-based approach' is adopted by local planning authorities. For these reasons, the KBA is included as an APIB on the Local Habitat Map.

In addition to those sites listed above, Nottinghamshire Wildlife Trust has 47 **nature reserves** covering 1,333 hectares; the Royal Society for the Protection of Birds (RSPB) has three reserves in the County covering 627 hectares; the Woodland Trust has nine sites totalling nearly 43 hectares; the National Trust manages one natural environment site extending to 1527 hectares, and the Canal and River Trust is responsible for around 138 hectares of semi-natural habitat (along with 176 km of watercourses). In addition, Forestry England is responsible for the management of around 5,738 hectares of woodland and associated habitats in Nottinghamshire, and the Environment Agency has around 960 hectares of land under its management. Local authorities in Nottinghamshire manage areas of green space with at least some element of nature conservation (which has not been accurately quantified but amounts to several thousand hectares, whilst various other public bodies including Network Rail, Highways England, Ministry of Defence and Ministry of Justice, as well as the Crown Estate, also own or manage land (although again the extent of this has not been quantified). Many of these nature reserves and green spaces have some other formal designation, as SSSIs, LWSs or LNRs.

In total, 21,881.4 hectares, or 10.1% of Nottinghamshire is 'protected', either legally (as an NNR, SAC, SSSI or LNR) or in planning policy (as an LWS, KBA or Ancient Woodland).

3.3 Habitats and species of importance

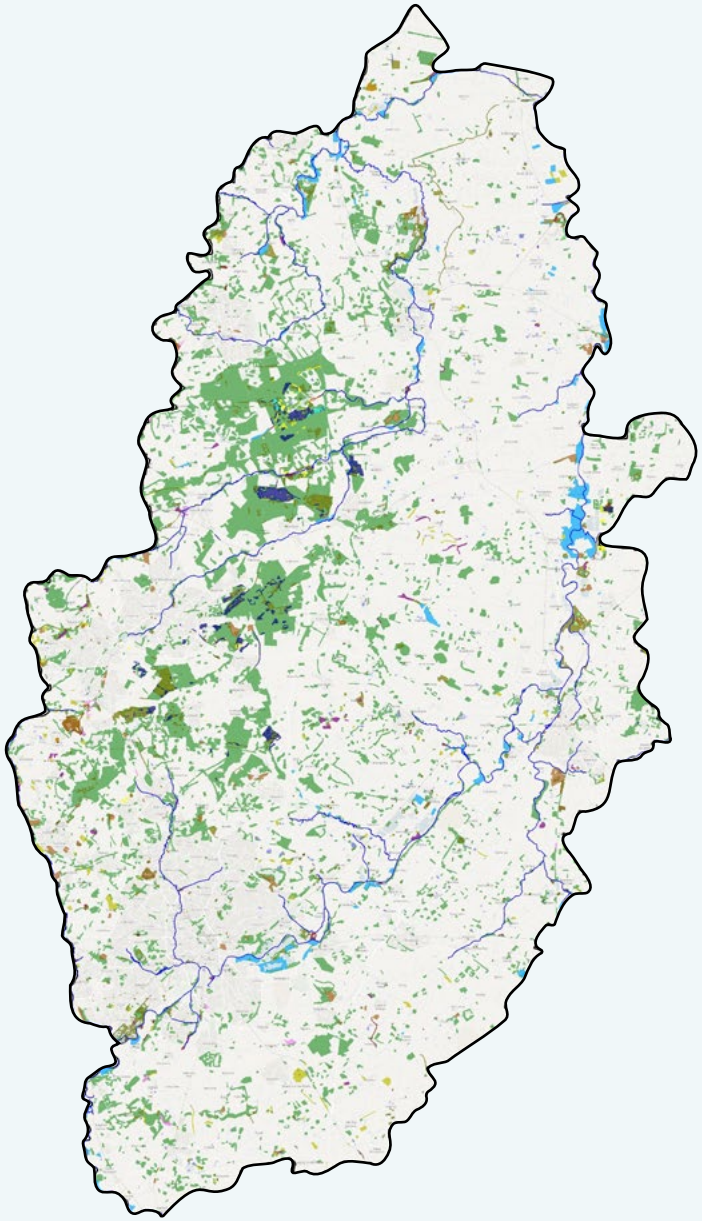
3.3.1 Introduction

Nottinghamshire supports a broad range of lowland habitats, although these have suffered significant historical (and in some cases, ongoing) losses due to the effects of agricultural intensification, commercial forestry, land drainage, coal mining, quarrying for aggregates and other products, and development (including urban expansion, industrialisation and linear infrastructure projects). As a result, large areas of semi-natural woodland and wetland have been lost, along with hedgerows, species-rich grasslands, and heathlands, although the historic nature of many of these losses means the scale is difficult to quantify. These habitat losses have been mirrored by population declines and local extinctions amongst a wide range of species.

25 Sherwood Forest KBA (keybiodiversityareas.org)

Our most important habitats, from a nature conservation perspective, are so-called '**habitats of principal importance** for conservation of biological diversity in England' by virtue of **Section 41** of the Natural Environment and Rural Communities Act - shortened to 'habitats of principal importance', 'Section 41 habitats' or simply '**priority habitats**'. These are recognised as being of national conservation importance and are the subject of national strategies for their protection, enhancement and expansion, and are listed in **Table 1**. A number of these are also defined as '**irreplaceable habitats**'[26] due to the fact that they cannot be recreated on any meaningful timescale – in a Nottinghamshire context, such irreplaceable habitats are limited to Ancient Woodland, Ancient and Veteran Trees and Lowland Fen. The distribution of the county's priority habitats, taken from Natural England's Priority Habitats Inventory (PHI) [27], plus the river network and using the National Forest Inventory to show woodland, is shown in **Figure 5**, illustrating the generally small and fragmented nature of these habitats whilst recognising the incomplete and at times inaccurate nature of the PHI.

Figure 5 – Priority habitats, woodlands and rivers in Nottinghamshire



26 See Irreplaceable habitats and BNG: what you need to know (blog.gov.uk) for a list of irreplaceable habitats as defined by government.

27 Priority Habitats Inventory - England (data.gov.uk)

Table 1 - list of priority habitats occurring in Nottinghamshire (sorted alphabetically)

Arable field margins
Coastal and floodplain grazing marsh
Eutrophic standing waters
Hedgerows
Lowland dry acid grassland
Lowland calcareous grassland
Lowland fens
Lowland heathland
Lowland meadows
Lowland mixed deciduous woodland
Mesotrophic lakes
Open mosaic habitat on previously developed land
Reedbeds
Rivers
Ponds
Traditional orchards
Wet woodland
Wood pasture and parkland

These priority habitats, along with a number of habitats of more local conservation concern (numbering 25 in total), are also covered by the **Nottinghamshire Local Biodiversity Action Plan (LBAP),** which seeks to drive action for these habitats (and a range of species) at a local level. In many cases, the precise extent of Nottinghamshire's habitats is unknown, or known only approximately, but the Nottinghamshire Biodiversity Action Group, which administers the LBAP, is developing inventories of the most important one. These build on previous habitat surveys carried out in Nottinghamshire in 1977 (the Elite Site Survey) and in 1988-89 and 1996-99 (Phase 1 Habitat Surveys), and as part of ongoing assessments of Local Wildlife Sites (LWSs).

As a result of co-ordinated conservation efforts over many years, and despite limited resources, downward habitat trends are being slowed and halted - and in some cases reversed through pro-active measures, including the high-quality restoration of mineral extraction sites and the delivery of environmental stewardship schemes on farmland. Nevertheless, whilst direct habitat loss is now less of a problem, securing appropriate management on what are often small and fragmented pockets of habitat continues to be a major issue and combatting indirect impacts such as eutrophication ('fertilisation'), the effects of climate change and disturbance remain significant problems.

3.4 Woody habitats

Nottinghamshire's woodlands are varied in character and unevenly distributed, ranging from small copses and shelter-belts in arable-dominated landscapes, to extensive ancient semi-natural woodlands and conifer plantations. Priority habitat woodland types occurring in the county are lowland mixed deciduous woodland, wet woodland and wood pasture and parkland, with the character and ecological importance of these woodlands determined largely by underlying geology and soils, age, and management (both current and historic).

In general terms, the majority of Nottinghamshire's larger woodlands are concentrated in the Sherwood Forest area from Newstead Abbey Park through to Clumber Park, with smaller concentrations in south Nottinghamshire between West Leake and Cotgrave, in the centre-east of the county between Ollerton, Tuxford and Newark; to the east of Retford; and north of Worksop. Woodlands are generally sparse or absent to the west of Mansfield, along much of the Trent Valley, and in the north-east of the county.

According to the National Forest Inventory for 2022[28], the total area of woodland above 0.5 hectares in size in the county is 21,592.6 hectares, accounting for 10% of Nottinghamshire's area. Of this, 5,971.4 hectares (27.7%) is conifer woodland (where coniferous trees form at least 80% of the canopy); 11,915.4 hectares (55.2%) is deciduous woodland (where broad-leaved trees form at least 80% of the canopy), 780.1 hectares (3.6%) is mixed woodland (where a wood contains both coniferous and broad-leaved trees, but neither forms more than 80% of the canopy), with the remaining 3113.6 hectares (14.4%) variously categorised as other woodland[29]. A further 8,020.5ha land is covered by of trees outside woodlands (e.g. in hedgerows, parks and along streets), covering 3.8% of the County area.

There is no information about the historic extent of woodland in the county, but reference to historic mapping shows that in the last couple of centuries significant areas of woodland have been converted to farmland and lost to the expansion of urban areas or to linear infrastructure projects. Such losses are now unusual, although have not completely ceased. In contrast, new areas of woodland have been created in recent times, although this does not have the same ecological value (at least not in the short to medium-term). Figures available for the period 1980 to 1998 show that total woodland cover in the county increased by over 1,800 hectares, with a further 4,294 hectares planted up to 2022.

Woodland is in a mixture of public and private ownership, with Forestry England responsible for around a third of all woodlands (by area) over 2 hectares in size. Across the county and ownerships, different management systems are used, from intensively managed commercial plantations to amenity and conservation-based systems, whilst 39% of woodlands in Nottinghamshire (by area) are unmanaged[30].

Data produced by Natural England indicates that approximately 2,614.6 hectares of woodland in Nottinghamshire is classified as 'ancient'; that is, woodland which has existed since at least 1600AD. Of this, 1,608.4 hectares is 'ancient semi-natural woodland', which is woodland comprising native species of tree and shrub arising from natural regeneration (i.e. not planted), whilst the remaining 1006.2 hectares is 'plantations on ancient woodland sites' (PAWS), which is woodland that has been felled and replanted with conifers or broadleaved trees, but which retain ancient woodland features such as undisturbed soils, ground flora and fungi. Ancient woodland is a finite resource and is defined as an irreplaceable habitat, featuring as an Area of Particular Importance for Biodiversity on the Local Habitat Map. Historic losses mean that ancient woodland covers just under 1.2% of the county's land area (almost identical to the national average), or around 12% of all woodland in Nottinghamshire. Most of the county's ancient woodland now found on the central claylands, in Sherwood, and along the western fringes of the county, and is fragmented and generally small in size. Very little ancient woodland remains in the intensively farmed southern, eastern and northern parts of the county, or around the major population centres.

28 National Forest Inventory (forestresearch.gov.uk) – the calculated figure excludes non-woodland habitats included in the NFI (Bare area, agricultural land, urban, grassland, road, other vegetation. Open water)
29 The categories for other woodland area felled, failed, ground preparation, low density, assumed woodland, young trees, coppice, shrub and windblow.
30 Figure from Forestry Commission Key Performance Indicators Report 2023-24 (pdf) (publishing.service.gov.uk) and Sub section 6 | LNRS Data Viewer (arcgis.com)

3.4.1 Lowland mixed deciduous woodland

Nottinghamshire's lowland mixed deciduous woodlands occur as two distinct primary types; oak-birch woodland on acidic geology where Pedunculate and Sessile Oaks and Silver and Downy Birches dominate, and ash-dominated woodland on circumneutral or calcareous geology where Common Ashes are the predominant trees. Small areas of oak-birch woodland are found sparingly in the east of the county on the windblown sands (the 'coversands') around Spalford and Besthorpe, but the habitat is more widespread across Sherwood. The richest oak-birch woodland site in Nottinghamshire is Sherwood Forest National Nature Reserve (NNR), whilst other key oak-birch woodland sites in Sherwood include Buckgates and the wider Birklands and Bilhaugh area around Sherwood Forest NNR, Newstead Abbey Park, Rufford Country Park and Clumber Park. Elsewhere, smaller pockets of oak-birch woodland, arising from natural regeneration or planting, can be found along disused railway lines or on former colliery land, as narrow strips around conifer plantations, or as copses on heathlands or within parkland settings. Many of these woodlands have been modified by the planting of trees species not native to Nottinghamshire, or through the establishment of invasive species such as Rhododendron.

Ash-dominated woodland occurs elsewhere in Nottinghamshire and is a particular feature of the west and centre of the county, including in an area known locally as the Mercia Mudwoods between Southwell and Tuxford. Elms were a major component of some ash-dominated woodlands prior to the arrival of Dutch elm disease, and the character of these woodlands will substantially change again if the impact of the fungal disease Chalara Ash Dieback takes hold as predicted; this will likely have a significant effect on the wildlife favouring these woodlands. The best ash-dominated woodlands have a varied structure and diverse ground-flora, but many woodlands are not managed or have been modified through the planting of stands of coniferous and/or deciduous trees that are not native to Nottinghamshire. Coppicing, mainly of Hazel, occurs in a small number of woods, having been reintroduced for conservation purposes, whilst browsing by deer is an increasing issue as it removes the understory and limits natural regeneration. An important cluster of ash-dominated woodlands occurs in the centre of the county between Southwell and Retford, with other valuable sites particularly on the western side of the county. Between Southwell and Nottingham, the so-called 'dumbles' are a particular feature of the county; these are narrow ribbons of woodland growing in small, steep valleys where watercourses have cut into the underlying rock.

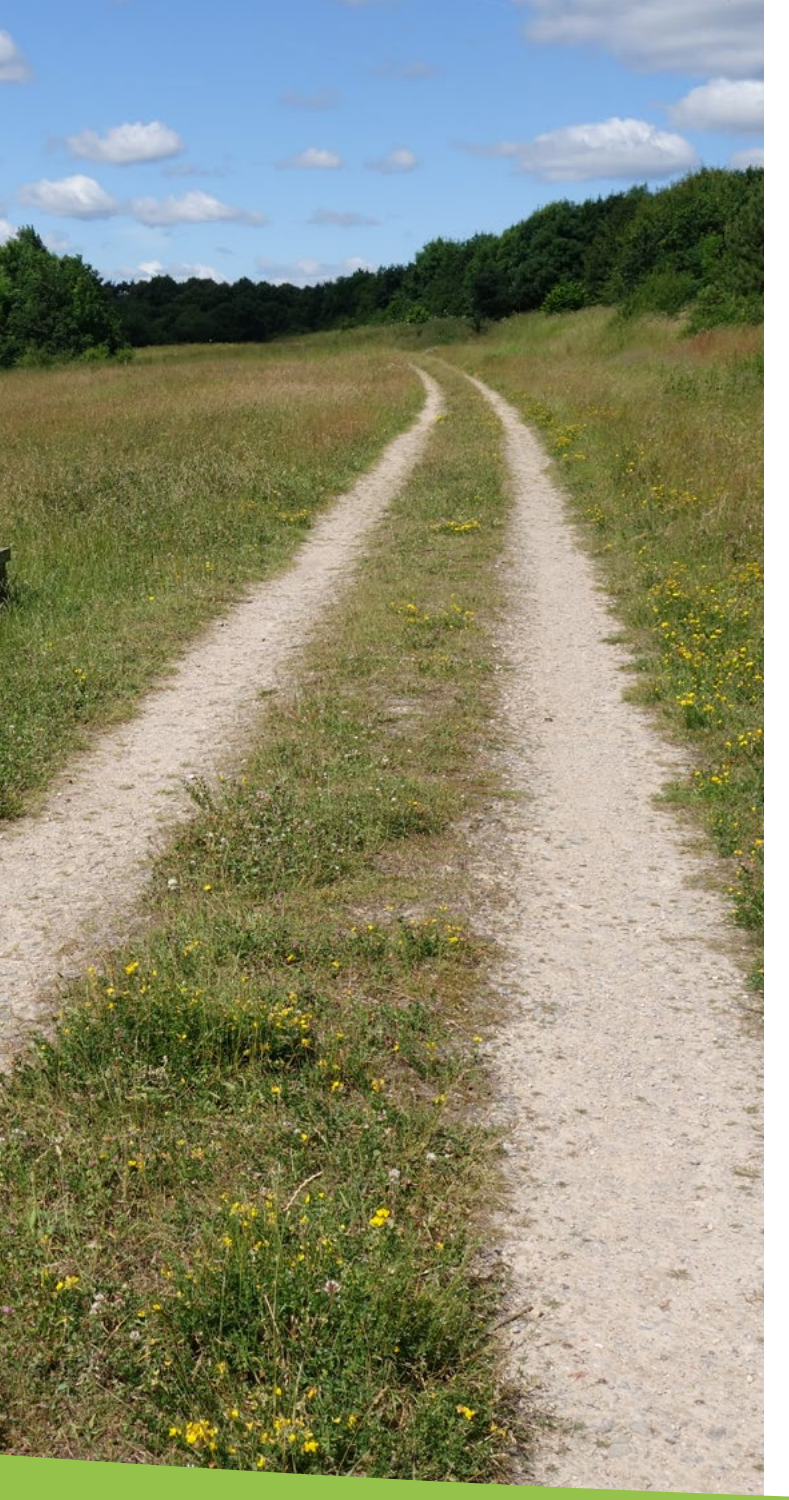
For further information, see the Local Biodiversity Action Plans for Oak-birch woodland (nottsbag.org.uk), Mixed ash-dominated woodland (nottsbag.org.uk), and Parkland and wood pasture (nottsbag.org.uk).

3.4.2 Wet woodland

True wet woodlands, developed on seasonally wet or poorly drained soils, and dominated by Alder and Crack Willow, are scarce in the county, with only limited pockets along watercourses and in other damp areas. Analogous habitats have developed at gravel pits, particularly on old silt lagoons such as on the Delta at Attenborough Nature Reserve, but these tend to support a field layer that is typical of highly fertile soils. Willow holts were once a feature of the Trent Valley, and Nottinghamshire was famed for the quality of its willow, used in basket making. In the 1880s there were 383 hectares of willow holts in the county concentrated in 24 parishes, reducing to 291 hectares in 1917 and 64 hectares by 1944[31]. The last traditionally managed willow holt was at Beckingham, but Farndon Willow Holt retains a collection of willow species and varieties.

For further information, see the Local Biodiversity Action Plan for Wet broadleaved woodland (nottsbag.org.uk).

31 Cousins, R (2007) A basketful – willow growing and basket making in Nottinghamshire and Lincolnshire. Nottinghamshire County Council & Heritage Lincolnshire.z



3.4.3 Scrub

Scrub is often an overlooked and undervalued habitat, and there are no figures available for the extent of this habitat in the county. It can be a component of woodlands, or a discrete habitat in its own right, and is often seen by conservationists as a problem, invading high-quality grassland habitats in the absence of management. Eventually, most areas of scrub will naturally develop into woodland, although some sites can remain as mature scrub for many years, and active management is normally required to retain scrub.

The composition and structure of scrub depends on factors such as the underlying substrate and soil moisture. In drier locations on neutral or calcareous substrates, scrub is normally dominated by Hawthorn or Blackthorn. On areas with acidic substrates, young Silver Birch, Common Gorse and Common Broom tend to prevail, whilst wetter sites are normally dominated by a range of willow species. Bramble can also be a component of scrub habitats or can form dense patches on its own. The habitat is important for a range of bird and invertebrate species, and although widespread, relatively extensive areas of scrub are more limited in number in the county.

3.4.4 Wood pasture and parkland

Sherwood Forest NNR and the nearby areas of woodland at Buckgates and Birklands West are the only true examples of wood pasture in Nottinghamshire, which collectively extend to around 500 hectares. The term wood pasture refers to a historic management system and vegetation structure, rather than a habitat type per se, where large, open-grown or high forest trees at various densities exist in a matrix of grazed grassland and, in some cases, heathland. Grazing was reintroduced in the NNR and Buckgates in 2003, and the site is currently managed with the aid of a small herd of longhorn cattle belonging to the Thoresby Estate.

Like wood pasture, parkland is best considered as a management system and vegetation structure, rather than a particular plant community. In simple terms, this structure comprises grassland, normally livestock-grazed, with open-grown mature or veteran trees at various densities of importance for saproxylic invertebrates and fungi. Parkland areas may also have had a designed landscape superimposed upon them. A range of native and introduced tree species can be present, and in many cases, parkland incorporates other habitats including stands of woodland and lakes. Parkland is normally associated with large country houses, halls and abbeys, such as at Welbeck Abbey, Clumber Park, Thoresby Hall, and Worksop Manor, as well as the abbeys of Rufford and Newstead, and Wollaton Hall. Whilst large areas of parkland have been lost under the plough, features such as mature trees, shelterbelts and waterbodies may remain. Around 2000 hectares of what is recognisably parkland (within the relevant habitat definition) remains in Nottinghamshire, according to Nottinghamshire Biodiversity Action Group figures.

For further information, see the Local Biodiversity Action Plan for Parkland and wood pasture (nottsbag.org.uk).

3.4.5 Planted coniferous woodland

Following the Second World War, there was a drive for self-sufficiency in timber, and consequently fast-growing conifers were widely planted. Extensive areas of Nottinghamshire's heathlands, especially to the east of Mansfield (what is now Clipstone Forest) were lost under new plantations, with areas of ancient woodland also being lost. These plantations largely occur on light, free-draining soils, dominating areas of Sherwood and adjacent areas to the south-west, with smaller areas elsewhere in the county. More recently, the restoration of colliery pit tips has seen new areas of conifer woodland planted in Sherwood and elsewhere in the Nottinghamshire coalfield.

Within mature conifer plantations, Scots Pine and Corsican Pine are the dominant species, with small percentages of other species making up the balance. As pioneer species, Corsican and Scots Pines are suited to the open ground conditions associated with a clearfell system of management. Economic Rotation length is typically between 40-100yrs, influenced by a number of factors including management objectives, growth rate, thinning prescription and market demand for different wood products. The impact of the fungal disease Dothistroma (Red Band) Needle Blight has significantly reduced the health and growth rate of these pine species, and much work to restructure these stands and introduce alternative species is underway, expanding the list of species being planted to include successional species adapted to growing under canopy. As such, there has been a shift away from a complete reliance on the clearfell system into a more varied range of silvicultural systems based on the principles of continuous cover, whilst retaining permanent and transitional open space.

Once harvested, clearfell areas are typically left fallow for two growing seasons before being restocked. Most conifer plantations also include an element of broadleaved species, whether through natural regeneration of native species such as birch and oak, the planting of fire breaks as seen in plantations dating from the early to mid-20th century, or the more recent deliberate inclusion of native and non-native broadleaves for economic, ecological and aesthetic reasons.

These coniferous plantations have value for a limited range of specialist species, perhaps most notably Woodlark, Nightjar and Goshawk. Once felled and subsequently restocked, these areas remain suitable for breeding Nightjars for up to 10 to 12 years; older stands can be used, but breeding productivity in these is lower. In the case of Woodlarks, such sites become unsuitable more quickly, with areas used for three to five years after restocking, depending on the density of trees and the amount of ground vegetation. Both species are largely restricted to Sherwood, and a significant proportion of the populations of both species in Nottinghamshire are associated with conifer plantations, and it is for this reason that such areas feature as part of the Sherwood KBA, which is shown as an Area of Particular Importance for Biodiversity on the Local Habitat Map.

For further information, see the Local Biodiversity Action Plan for Planted coniferous woodland (nottsbag.org.uk).

3.4.6 Ancient and veteran trees

Ancient and veteran trees can be individual trees or groups of trees within wood pastures, historic parkland, hedgerows, orchards, parks or other areas, and are often found outside ancient woodlands. The age at which trees become ancient or veteran varies by species. Ancient trees are exceptionally valuable, and few trees become ancient. Veteran trees may not be very old but have high biodiversity value. All ancient and veteran trees are defined as irreplaceable habitats, and thus feature as Areas of Particular Importance for Biodiversity on the Local Habitat Map.

Information on ancient and veteran trees in Nottinghamshire is variable, with a well-monitored and highly important population of such trees in the Birklands area of Sherwood, centred on the National Nature Reserve. This site supports one of the highest concentrations of ancient oaks in Europe, with over 400 standing living Pedunculate and Sessile Oaks as well as many standing dead oaks, fallen trees and ancient tree stumps – with further ancient oak trees in adjacent areas of woodland outside the NNR. Elsewhere, information is patchier, and the Woodland Trust's Ancient Tree Inventory (ATI)[32] is recognised as being incomplete – therefore, if a tree does not appear on the ATI, it does not necessarily follow that it is not an ancient or veteran tree. The ATI is constantly being added to as additional ancient and veteran trees are identified, and ancient trees of a range of species are scattered throughout the County in woodland, parkland, hedgerows and churchyards.

32 Ancient Tree Inventory (woodlandtrust.org.uk)

3.4.7 Species of importance

A number of species or groups of species associated with woody habitats are of particular significance in the LNRS area, some at a national level. These include:

- A saproxylic (deadwood) invertebrate assemblage found in Sherwood Forest NNR and other sites in Sherwood (national significance).
- A number of other notable invertebrates occurring in the oak-birch woodlands and wood pasture of Sherwood, including Hazel Pot Beetle, Welsh Clearwing, Midas Tree-weaver and Magnificent Cranefly.
- A diverse breeding bird assemblage associated with oak-birch (and other) woodlands in Nottinghamshire, including Honey-buzzard, Lesser Spotted Woodpecker, Marsh Tit, Redstart, Spotted Flycatcher, Tree Pipit, Hawfinch and Woodcock.
- 'Heathland' birds associated with clearfell areas in conifer plantations – Nightjar and Woodlark (national significance).
- Mammals, including Hazel Dormouse (reintroduced to woodlands in north-east Nottinghamshire) and Barbastelle.

3.4.8 Prospects for recovery and current initiatives

Improving the condition and extent of Nottinghamshire's woodlands is considered readily achievable with funding and appropriate measures in place to engage with landowners. This should include introducing active woodland management to sites which currently have none (targeting ancient woodlands as a priority), establishing new areas of native broad-leaved (and other) woodland through both planting schemes and natural colonisation (coupled with deer management where necessary); areas of land with lower agricultural and ecological value exist on which woodland creation should be targeted. There is further scope to better understand the distribution of ancient and veteran trees, and to establish more trees outside woodlands including in hedgerows, riparian zones, urban areas and as part of agroforestry schemes.

There are a number of current or recent initiatives within the LNRS area which benefit woody habitats and associated species, including:

- National woodland creation programmes funded through the England Woodland Creation Offer (gov.uk) and Trees for Climate (englandscommunityforests.org.uk).
- Regional and sub-regional initiatives to expand woodland cover including the Midlands Forest Network (midlandsengine.org) and Greenwood Community Forest (greenwoodforest.org.uk).
- Volunteer-led surveys of ancient and veteran trees through the Woodland Trust's Ancient Tree Inventory (woodlandtrust.org.uk).
- Management of ancient and veteran trees at Sherwood Forest NNR (and elsewhere) including the use of 'veteranisation' techniques to bridge the gap between different age cohorts of trees.
- Parkland re-creation on former arable farmland at Clumber Park by the National Trust.
- Dormouse reintroduction at two woodlands in north Nottinghamshire by the Nottinghamshire Dormouse Group (nottsdormousegroup.uk).
- The restoration of a 12 hectare open oak-birch woodland with heathland glades on Nottinghamshire County Council's No-Man's Land site, funded through the Miner 2 Major Landscape Partnership Scheme.

3.5 Watercourses and wetlands

Nottinghamshire's watercourses and wetlands include its rivers, streams, ditches and canals, as well as gravel pits, lakes, ponds, reservoirs and subsidence flashes, marshes, fens and swamps. Floodplain grazing marsh (wet grasslands) are also covered in this section. Wetland sites can often be a complex mosaic of habitats transitioning from open woodland, through reedbeds, marsh or swamp, to scrub and wet woodland. The priority habitat types occurring in the county are rivers, eutrophic standing water, mesotrophic lakes, floodplain grazing marsh, reedbed, lowland fen and ponds.

3.5.1 Watercourses and related habitats

The county is crossed by a network of watercourses – rivers and streams - draining generally in an easterly and northerly direction towards the Humber. The largest of these is the River Trent, whilst the county's other significant watercourses include the Rivers Erewash, Leen, Maun, Meden, Poulter, Ryton, Idle and Devon. The best sections of watercourse support areas of marginal wetland and tall herb vegetation along with trees (predominantly willows), but many watercourses have been modified in the past – straightened, deepened and constrained by flood banks, or affected by weirs, causing considerable ecological damage and blocking fish passage. Sections of river continue to be subject to periodic desilting works, for various reasons, and in the case of the Trent, where navigation by boats is required.

Water quality has improved in most of the county's watercourses in recent years, in part due to the decline in heavy industry and mining. However, sewage releases and agricultural run-off (especially phosphates and nitrates) remain a widespread problem, and more locally, the leaching of acids and salts from colliery pit tips is an ongoing issue. Environment Agency data, represented in **Figure 6**, indicates that only two watercourses flowing within Nottinghamshire (wholly or partly) have a Good Ecological Status (as defined by the Water Framework Directive, using 2022 data), equating to a watercourse length of 22.4 km, 50 have a Moderate Ecological Status (741.2 km), 23 have a Poor Ecological Status (267.6 km) and two have a Bad Ecological Status (9.3 km)[33].

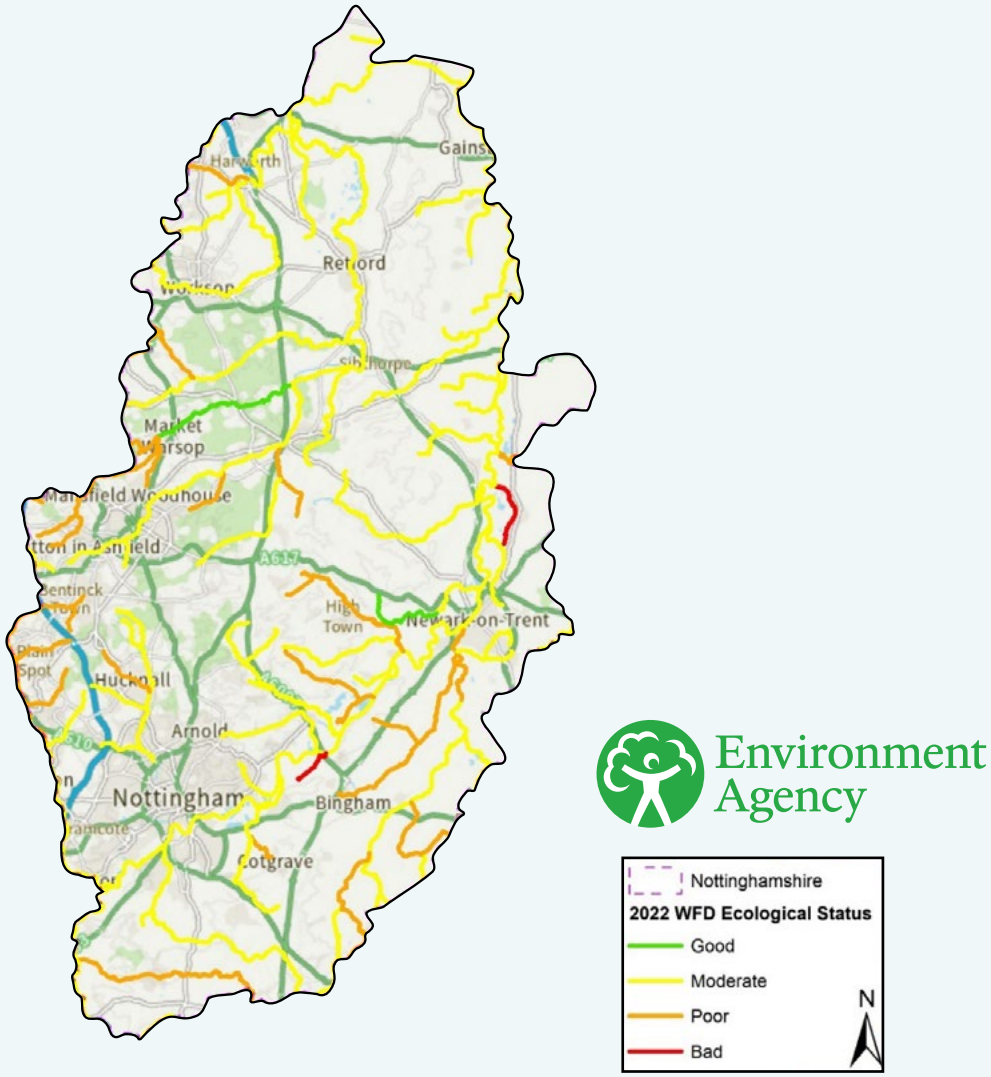
A small number of canals - the Erewash, Nottingham, Beeston, Grantham and Chesterfield – support a similar type of habitat to that provided by rivers, although many sections are stagnant or dry and water quality can be poor.

For further information, see the Local Biodiversity Action Plans for Rivers and streams (nottsbag.org.uk) and Canals (nottsbag.org.uk) and the relevant CaBA webpages[34].

33 Humber River Basin District - Catchment Data Explorer (environment.data.gov.uk)

34 Idle - CaBA (catchmentbasedapproach.org) and Lower Trent & Erewash - CaBA (catchmentbasedapproach.org)

Figure 6 – Ecological Status of Nottinghamshire's watercourses



3.5.2 Floodplain grazing marsh

Prior to land drainage and the construction of floodbanks which separated rivers from their floodplains, extensive areas of floodplain grazing marsh (also known as lowland wet grassland) existed in places. These are periodically inundated pastures or meadows with ditches which maintain high water levels and are grazed by cattle or cut for hay or silage. In this habitat, the ditches can be rich in plants and invertebrates and may still support Water Voles. Sites may contain seasonal water-filled hollows and permanent ponds and scrapes with emergent swamp communities and can be of considerable value for breeding waders and wintering wildfowl. The grass sward is not normally botanically diverse, with most examples having been agriculturally improved.

Floodplain grazing marsh remains one of the highest conservation priority habitats in Nottinghamshire. Small pockets persist along the River Erewash (although these are invariably too small to support significant numbers of breeding waders or wintering wildfowl), whilst larger areas of grassland next to the River Trent at Girton and the Holmes are normally too dry to qualify as this habitat, but do support large numbers of wildfowl during winter floods.

However, in the north of the county, fragments of floodplain grazing marsh remain in the Idle Valley between Scaftworth and Misson, and around 90ha has recently been created at Beckingham Marshes. The area of floodplain grazing marsh in the Idle Valley was formerly much more extensive, largely surviving drainage attempts by the Dutch engineer Vermuyden in the 17th Century. However, a new terminal pumping station at West Stockwith was constructed in the early 1980s and saw the area of SSSI interest reduced from 244.6 hectares to 88.5 hectares in 1983. This compromised the area's international importance for wintering Bewick's Swans, with the number of wintering birds dropping from an average of 80 (and peak of 174) to zero in just a few years[35].

For further information, see the Local Biodiversity Action Plan for Lowland wet grassland (nottsbag.org.uk).

3.5.3 Eutrophic and mesotrophic standing water

Contrasting with the loss of floodplain grazing marsh is the dramatic increase in open water in Nottinghamshire, especially over the last 50 years or so. Larger expanses of water (those exceeding two hectares in size), fed by either surface or ground waters, now cover over 1,300 hectares of the county. The majority of these are eutrophic in nature (nutrient rich with high biological productivity), with limited extents of mesotrophic standing water (with moderate levels of nutrients and biological productivity) purported to occur at a number of locations in the Idle Valley. Typically, such water bodies may be fringed by a narrow band of marsh and swamp vegetation and willow scrub.

Most of this increase in open water is due to the creation of water bodies as a by-product of quarrying for sand and gravel in the Trent and Idle Valleys. Whilst habitats at some of the earlier extraction sites developed by default rather than by design, it is now normal for planning permissions to require that extraction sites are restored to specific wetland habitats, with waterbodies that have areas of shallow water and sloping margins to allow the development of marginal vegetation. The legacy of completed and ongoing mineral extraction is evident, with such sites now ranking amongst the county's best places for birds and forming a string of sites along the Trent and Idle, some supporting significant concentrations of wintering wildfowl.

A range of other water bodies can be found that relate to extractive industries (including limestone, sandstone, clay and gypsum quarries and colliery pit tips), whilst other small but valuable wetlands known as flashes have developed in areas of underground coal mining subsidence. Other manmade lakes of note are those that were created on the parkland estates in north Sherwood and The Dukeries, as well as in several other parkland estates, whilst reservoirs – namely King's Mill and Moorgreen Reservoirs - are important waterbodies in the west of the county.

What may be the only 'natural' water body of any significant size in Nottinghamshire is the Fleet at Besthorpe, which sits on what was presumably a previous course taken by the Trent. Elsewhere, former oxbow lakes, such as at Bole Ings and West Burton, and other palaeochannels, have long since silted up and vegetated over.

For further information, see the Local Biodiversity Action Plan for Eutrophic and mesotrophic standing water (nottsbag.org.uk).

35 The Birds of Nottinghamshire (2019), page 35

3.5.4 Ponds

Ponds, considered to be waterbodies that are less than 2 hectares in size, can be found across the county, occurring as components of larger wetland sites, in woodlands, or as isolated features in farmed landscapes (especially where livestock farming persists or was formerly prevalent). Although there is no data to quantify how many ponds have been lost over the last few centuries, many have been filled in or lost to siltation and overgrown by surrounding vegetation, as evidenced by reference to historic mapping.

Those ponds that remain can be of importance to aquatic invertebrates, amphibians and aquatic and emergent plants. Notable clusters of ponds survive in some areas of Nottinghamshire, such as southern Rushcliffe, whilst small waterbodies associated with former lines of the Trent can still be found to the north of Collingham. More recently, Sustainable Urban Drainage Schemes (SuDS) are providing small areas of permanent standing water within new industrial parks or housing developments, as are balancing ponds next to new roads.

3.5.6 Reedbed

One habitat that is a particular target for habitat creation during the restoration of sand and gravel quarries, as highlighted above, is reedbed. This habitat is dominated by stands of Common Reed, with the water table at or above ground level for most of the year. Reedbeds often contain areas of open water and willow scrub, whilst other habitats such as wet grassland and wet woodland may be associated with them. Left unmanaged, reedbeds will gradually dry out, requiring rotational cutting and careful control of water levels.

These creation efforts are in part due to the recognised need to provide extensive areas of this habitat away from coastal areas, which will be increasingly prone to inundation as a result of climate change and sea level rise. Although small by national standards, concentrations of this habitat occur in the Trent and Idle Valleys, but only at Attenborough NR, Idle Valley NR, Netherfield Lagoons and Langford Lowfields does the total extent of reedbed exceed 10 hectares. At the latter site, recent quarrying has allowed land forming to take place to create conditions for the establishment of far more extensive areas of reedbed, aimed at encouraging regular breeding by habitat specialist birds like Bearded Tit and Bittern. Once completed, the consented working area at Langford will deliver around 70 hectares of this habitat, bringing the county total to around 125 hectares according to data held by Nottinghamshire Biodiversity Action Group.

For further information, see the Local Biodiversity Action Plan for Reedbed (nottsbag.org.uk).

3.5.7 Fen, marsh and swamp

Fens are wetlands fed by mineral-rich ground or surface-water with a neutral or alkaline pH, and are dominated by grasses and sedges. They have a very restricted distribution in Nottinghamshire, totalling around 137.2 hectares, with generally small areas dotted in the west of the county, in Sherwood, and along the Trent and Idle Valleys, most notably at Misson Carr. Lowland fen is classified as an irreplaceable habitat and as a result, is included on the Local Habitat Map as an Area of Particular Importance for Biodiversity.

Marsh and swamp habitats also have a restricted distribution in Nottinghamshire, and whilst more widespread than fens, and historic mapping indicates that areas of marsh and swamp (as well as fen) were previously far more extensive. Both are similar in nature, with the water table generally close to (marsh) or above (swamp) ground level. Marshes in particular can be grassy, with a high proportion of rushes and sedges, whilst swamps are typically transition zones between open water and adjacent terrestrial habitats. As already indicated, small areas of this habitat often occur as a narrow margin around lakes and gravel pits, although slightly larger expanses can be found at a small number of sites.

For further information, see the Local Biodiversity Action Plan for Fens, marshes and swamps (nottsbag.org.uk).

3.5.8 Species of importance

A number of species or groups of species associated with watercourse and wetland habitats are of particular significance in the LNRS area, and some at a national level. These include:

- Otter and Water Vole (the latter reduced to small number of residual populations).
- Fish associated with rivers and streams, including European Eel, Atlantic Salmon, River Lamprey and Sea Lamprey.
- White-clawed Crayfish, occurring on a limited number of watercourses in west Nottinghamshire.
- Reedbed birds in the Trent and Idle Valleys including Bearded Tit, Bittern and Marsh Harrier.
- Breeding waders and wintering wildfowl associated with wet grassland and other riverine and wetland habitats including Curlew, Redshank and Lapwing.
- Amphibians using ponds, including Common Toad and Great Crested Newt.
- Moths associated with fenland habitat including Marsh Carpet, False Mocha, Valerian Pug and Marsh Pug.

3.5.9 Prospects for recovery and current initiatives

Significant work is required to recover the condition of the County's watercourses, but this is achievable with investment, regulatory enforcement and political will. Other river restoration works such as channel re-naturalisation and the removal of structures can also be delivered with a sufficient level of investment.

The restoration of mineral workings provides significant opportunities for the creation of extensive areas of new wetland in Nottinghamshire. Appropriate stewardship funding and targeting would allow the restoration and creation of floodplain grazing marsh at appropriate locations, and the restoration and creation of ponds in the wider countryside.

There are a number of current or recent initiatives within the LNRS area which benefit watercourse and wetland habitats and associated species, including:

- The creation of wetland habitats through the restoration of quarries in the Trent and Idle Valleys by mineral extraction companies – including flagship projects such as the Langford Lowfield RSPB reserve (rspb.org.uk) and Nottinghamshire Wildlife Trust's Idle Valley Nature Reserve (nottinghamshirewildlife.org).
- Nottinghamshire Wildlife Trust's project to reintroduce Beavers (nottinghamshirewildlife.org) within an enclosure at the Idle Valley Nature Reserve and the Water Vole Recovery Project (nottinghamshirewildlife.org)(funded by Natural England's Species Recovery Programme Capital Grant Scheme and supported by Severn Trent), including habitat improvements, American Mink control and establishment of a Water Vole 'ark' site.
- The Nottinghamshire Three Rivers Restoration Project (nottinghamshirewildlfire.org) (funded by Severn Trent and delivered by Nottinghamshire Wildlife Trust), seeking to improve the water environment (including low flows) across the Rainworth Water, Vicar Water and Bevercotes Beck.
- The River Idle Catchment Partnership (catchmentbasedapproach.org) and Lower Trent and Erewash Catchment Partnership (trentrivertrust.org), bringing together a range of organisations seeking to address issues associated with land and water management and facilitating a wide range of projects.
- The Trent Gateway (trentrivertrust.org) project, led by the Environment Agency, which aims to remove barriers to fish passage along the Trent, with work to construct the country's largest fish pass at Colwick completed in 2023.
- The Nottinghamshire Invasive Non-native Species Initiative (nottsbag.org.uk) undertaking control work led by Nottinghamshire Biodiversity Action Group and the Environment Agency.
- A project to establish a White-clawed Crayfish ark site in the county to safeguard this highly threatened species, with work ongoing to identify suitable locations.
- The Mansfield Green Recovery Project (stwater.co.uk), a £76m investment by Severn Trent to deliver a range of nature-based solutions to protect communities from flooding.
- A new Natural Flood Management (nottinghamshirewildlife.org) project to reduce flooding on the River Ryton lead by Nottinghamshire Wildlife Trust, Nottinghamshire County Council (as Local Lead Flood Authority) and Environment Agency.
- The government-funded Nature for Climate Peatland Grant Scheme (gov.uk), led by Nottinghamshire Wildlife Trust in Nottinghamshire, supporting wetland habitat creation and restoration through the Humberhead Levels Peatland Restoration Project (ywt.org.uk).
- The Environment Agency-funded Lowland Agricultural Peat Water Discovery Pilot, aiming to restore habitats on peatland farms in the north of the County (including fen, marsh and swamp), being delivered by Nottinghamshire Wildlife Trust.
- The Thriving in a Wilder Trent (nottinghamshirewildlife.org) project, led by Nottinghamshire Wildlife Trust and funded by the Species Survival Fund and Severn Trent Water, working on a 90km stretch of the Trent between Willington (in Derbyshire) and Dunham Bridge.
- The Nottingham Canal Improvement Partnership (canalrivertrust.org.uk), aiming to improve a 5 mile length of the Nottingham – Beeston Canal for wildlife and people.

3.6 Heathland and acid grassland

Nottinghamshire's heathlands are comprised of the priority habitats lowland dry acid grassland and lowland heathland, which are often closely associated and differ primarily in the extent of heather cover. In Nottinghamshire, where heathlands generally lack the extensive heather cover of the Dorset or Suffolk heaths, areas with more than 25% heather coverage are normally defined as heathland, whereas area with a heather coverage below this figure are considered to be acid grassland. Nevertheless, distinguishing between the two habitats can be problematic at times, especially where the two habitats occur in a mosaic.

The dwarf shrubs Ling and Bell Heather are a defining feature of heathland. Scrub is often present, comprising gorse, broom and young birch, along with scattered oak, birch or coniferous trees, and Bracken can form extensive stands. Historically, such habitats were grazed by livestock, and some current conservation management seeks to continue this process, often with rare breed sheep or cattle, and grazing by ponies (and goats) has also been trialled, as have pigs. Where grazing is not possible, management is carried out mechanically.

The majority of the county's acid grassland and heathland occurs on the Sherwood Sandstone. Here, the habitat is fragmented, with much of it now occurring as small pockets on golf courses, within conifer woodlands or in disused railway cuttings. The county's largest extents are in Clumber Park, which supports about 170 hectares of this habitat, and at Budby South Forest, which supports a further 145 hectares. In the east of the county a small area of acid grassland occurs on the windblown sands (the coversands), focussed on Spalford and Besthorpe Warrens and adjacent areas. These windblown sands also occur at various sites in Lincolnshire, and the Nottinghamshire sites represent their most westerly extent.

The restoration of colliery pit tips has allowed the creation of new areas of heathland in Sherwood, most notably at Vicar Water Country Park, Thoresby Colliery and Rufford Colliery. At the latter site, ongoing restoration promises to deliver the largest contiguous area of heathland in the county. Collectively, these schemes will go a modest way towards regaining some of the historic losses experienced by these habitats as a result of conversion to farmland, conifer plantations and housing developments. Historic mapping analysed as part of the State of Nature in Sherwood report[36] gives an indication of the previous extent of this habitat. Chapman's map of 1774 suggests that there was in excess of 23,500 hectares of heathland habitat in Sherwood at that time; by the time of Sanderson's map in 1835, this had reduced to around 4,500 hectares and declined further by the time of the Ordnance Survey 6 Inch S1 in 1885 to around 2,400 hectares. There then appeared to be a slight resurgence in heathland with around 3,200 hectares mapped on the Ordnance Survey 6 Inch S2r map of 1920. Contemporary figures held by Nottinghamshire Biodiversity Action Group suggest that there is currently in the region of 1,250 hectares of heathland and acid grassland in the county. This means that just 5% of the heathland which existed at the end of the 18th Century remains, and that the scale of loss in Nottinghamshire has been even greater than the national estimate of an 80% loss of heathland since 1800.

For further information see the Local Biodiversity Action Plans for Lowland heathland (nottsbag.org.uk) and Lowland dry acid grassland (nottsbag.org.uk).

36 The State of Nature in Sherwood Report 2015 (pdf) (nottsbag.org.uk)

3.6.1 Species of importance

A number of species or groups of species associated with heathland and acid grassland habitats are of particular significance in the LNRS area, some at a national level. These include:

- Diamond-back Spider, which occurs on one small area of heathland that is its only known UK site (national significance), and the spiders Zora silvestris and Gorse Orb Weaver.
- Other scarce and notable invertebrates including Black Oil Beetle, Glow-worm, Stripe-winged Grasshopper and populations of hymenoptera.
- Heathland birds including Nightjar, Tree Pipit, Stonechat and Woodlark.
- Plants including Bilberry, Creeping Willow, Heath Cudweed and Petty Whin.
- A range of bryophytes including Delicate Notchwort, Ladder Flapwort, Golden Goblin, Cow-horn Big-moss, Acute-leaved Big-moss and Feathery Bog-moss.

37 The State of Nature in Sherwood Report 2015 (pdf) (nottsbag.org.uk)

3.6.2 Prospects for recovery and current initiatives

The generally small and fragmented nature of Nottinghamshire's remaining heathland and acid grassland means that ongoing investment is required to ensure they remain under management. Further significant opportunities for the creation of these habitats is limited with the completion of colliery restoration, although potential future changes to agricultural patterns in Sherwood may facilitate further creation works in the future. Implementation of national policies relating to the restoration of open habitats would allow in particular the linking and expansion of existing habitat patches.

There are a number of current or recent initiatives within the LNRS area which benefit heathland and acid grassland habitats and associated species, including:

- Heathland restoration projects delivered by Sherwood Forest Trust and Nottinghamshire Wildlife Trust across the Sherwood Forest area, and at Clumber Park by the National Trust.
- The Baring All at Budby (biffa-award.org) project, which saw funding secured by the RSPB to expose bare ground to benefit invertebrates along with new fencing to facilitate conservation grazing at Budby South Forest.
- Significant heathland creation and restoration at the former Rufford and Thoresby Collieries by Harworth Estates and Nottinghamshire Wildlife Trust as part of planning requirements, and heathland creation also occurring at Thoresby Colliery as part of planning requirements.
- The restoration and management of open heathland areas within coniferous plantations managed by Forestry England.
- The Sherwood Habitats Strategy Group has produced two 'State of Nature in Sherwood' reports, most recently in 2023 which characterise the status of area's unique biodiversity for the first time.

3.7 Farmland

Farmland is the dominant land use in Nottinghamshire. Based on Defra statistics from 2021 , the total farmed area of the county is 138,104 hectares, or around 64% of the county area, spread over 1328 holdings. Of this, just under 70% of the farmed area is arable land, just over 23% is grassland (temporary, permanent or rough grazing), with the balance either unattributed, or farm woodlands. The dominant crops are cereals, with just over 59,140 hectares grown (of which roughly two thirds is wheat), whilst there are around 40,900 head of cattle (dairy and beef), 93,100 pigs, 72,500 sheep and 4.79 million poultry reared in Nottinghamshire. The majority of farmland in Nottinghamshire is categorised as Grade 3 ('Good to Moderate') under the Agricultural Land Classification, with a more limited extend of Grade 2 ('Very Good') land, small areas of Grade 4 ('Poor') land, and only very small areas of Grade 1 ('Excellent') land.

As elsewhere in lowland England, farming in Nottinghamshire became increasingly intensive in the post-war period, with large inputs of fertilisers, herbicides and pesticides often applied to the land to deliver increasing yields, and the introduction of irrigation (especially on free-draining sandy soils in Sherwood) also having a significant impact on productivity. There was a switch from spring-sown to winter-sown cereals (especially winter wheat), a general simplification of crop rotation systems, a move away from mixed farms (i.e. those practicing both arable cropping and the rearing of livestock), and the large-scale removal of hedgerows to allow the efficient operation of ever-larger machinery. All this contributed to the well-documented national decline in farmland wildlife, to which Nottinghamshire has not been immune. Despite environmental stewardship initiatives the dramatic declines in farmland birds especially, witnessed in the latter part of the 20th century have continued largely unchecked into the early 21st century.

In terms of priority habitats, those found in Nottinghamshire associated with farmland (and which are not covered elsewhere in this section) are arable field margins, hedgerows, ditches and traditional orchards.

Arable fields dominate the agricultural landscape in Nottinghamshire, with crops rotated on an annual basis, affecting the local distribution of farmland wildlife both spatially and temporally. Located between the infield crop and the adjacent field boundary, arable field margins can take a number of forms. Less intensively managed than the adjacent crop, these generally grassy strips support a relatively diverse range of plants (including notable arable 'weeds'), and populations of invertebrates and small mammals (and species which feed on these including farmland birds and raptors).

Outdoors pigs are generally found on lighter soils in the centre of the County, and where the rearing of other livestock, such as in the west and south of the county, farms continue to support areas of pasture which are generally improved (subject to the application of fertilisers and re-seeded with Perennial Ryegrass), or at best semi-improved (not botanically species-rich). In the east of the county, a notable concentration of neutral pasture exists in the area known as the Holmes, sitting beside the Trent between Sutton-on-Trent and Normanton-on-Trent, the grazing rights for which are auctioned off annually.

There are increasing pressures on farmland for other uses, especially for the production of energy. Elephant grass (Miscanthus) and short-rotation coppice (normally willow) are grown at scale as energy crops (biofuels) to be burnt to generate electricity or produce heat. Recently, crops such as maize have started to be grown solely as a feedstock for anaerobic digester plants, whilst a very noticeable development is the increasing number of large solar arrays in the Nottinghamshire countryside. However, areas of grassland amongst the rows of photovoltaic panels are spared from intensive management and could prove to be beneficial to some farmland species.

There is a rapidly growing interest in regenerative agriculture, which benefits soils, water, wildlife and carbon, and which is being adopted at scale by some farms in the County.

For further information see the Local Biodiversity Action Plan for Farmland: arable farmland, arable field margins and improved grassland (nottsbag.org.uk).

37 The State of Nature in Sherwood Report 2023 (pdf) (nottsbag.org.uk)

38 June 2021 census on agriculture and horticulture in England Farming statistics (www.gov.uk)

3.7.1 Field boundaries

The type and quality of field boundaries varies within Nottinghamshire and from farm to farm. Most field boundaries are hedges, which vary from well-managed, species-rich hedgerows to low, heavily-clipped, species-poor hedges containing gaps. There are also plenty of places where hedges are completely absent, with just a narrow grass strip separating fields. Some hedges support hedgerow trees, often Pedunculate Oak or Common Ash, but many do not. There are no local figures to quantify the loss of hedgerows that took place in the county in the post-war period, but reference to historic mapping indicates that the losses were extensive, and in the East Midlands as a whole it is estimated that 16,000 miles of hedgerow were lost between 1947 and 1985. Data from the Centre for Ecology and Hydrology[39] suggests that there are around 7,340 kilometres of hedgerows in Nottinghamshire, although information about the quality of these is lacking.

Whilst some hedgerow replanting and rehabilitation has taken place in recent times (e.g. the gapping up and laying of defunct hedges), occasional losses still occur. Hedgerows remain the most significant wildlife feature in many farmed landscapes, providing habitat for a wide range of birds and invertebrates as well as mammals such as bats which forage and commute along them. They also function as wildlife corridors, allowing the dispersal and movement of species between woodlands and other habitats.

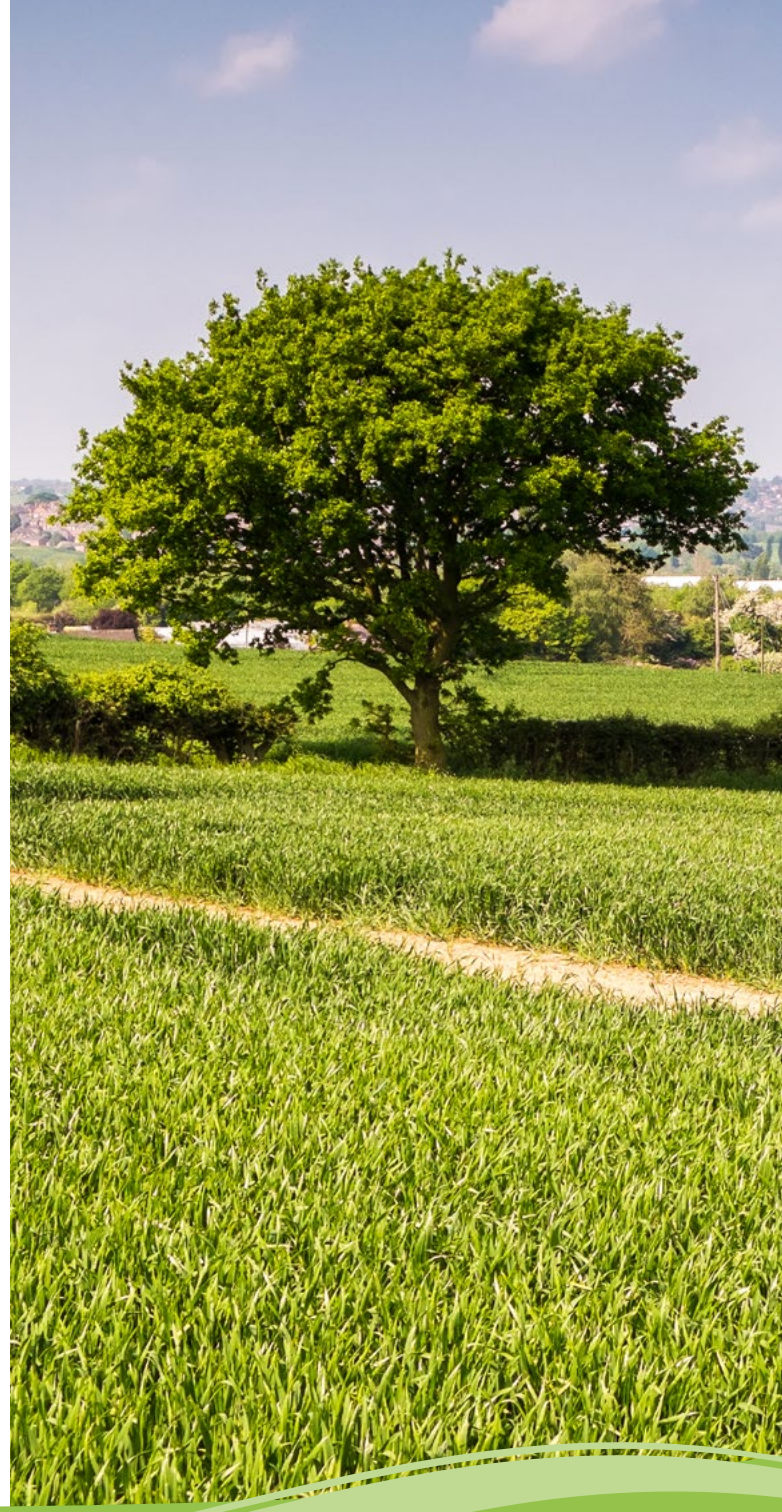
For further information see the Local Biodiversity Action Plan for Hedgerows: including ancient and/or species-rich hedgerows (nottsbag.org.uk).

In some areas of the north-west of the county, close to Derbyshire, there are examples of dry-stone walls forming field boundaries instead of hedges, whilst in the north of the county, especially in the carrlands, hedges are generally absent. Instead, field boundaries are formed by ditches which serve the purpose of draining the land, with the resultant open landscape reminiscent of the East Anglian fens. These networks of ditches can be of value for aquatic invertebrates, although insensitive mechanical clearance can limit their value.

3.7.2 Orchards

Traditional orchards support at least five mature fruit trees and are subject to low intensity management, with grassland around the trees traditionally cut for hay or grazed. They are structurally and ecologically similar to wood pasture and parkland habitats and can be wildlife-rich. Around 170 hectares of this habitat occurs in the county according to Nottinghamshire Biodiversity Action Group data, with a widespread but scattered distribution that shows a distinct southern and eastern bias - although historically there were also concentrations in the south-west of the county. However, sites rarely exceed a couple of hectares in size and many are neglected, with others having been grubbed out so they can be put to more profitable use. Commercial orchards can found, for example, around Southwell, which are of much lower value than traditional orchards, being intensively managed, more uniform in structure, and lacking old trees.

39 UKCEH Land Cover Plus: Hedgerows 2016-2021 (England) (ceh.ac.uk); this dataset covers 'woody linear features' including hedgerows, tree lines and semi-natural thickets of shrubs and trees on field boundaries, determined using LIDAR remote sensing, and hence results should be treated with a degree of caution.



3.7.3 Species of importance

A number of species or groups of species associated with farmland habitats are of particular significance in the LNRS area, and some at a national level. These include:

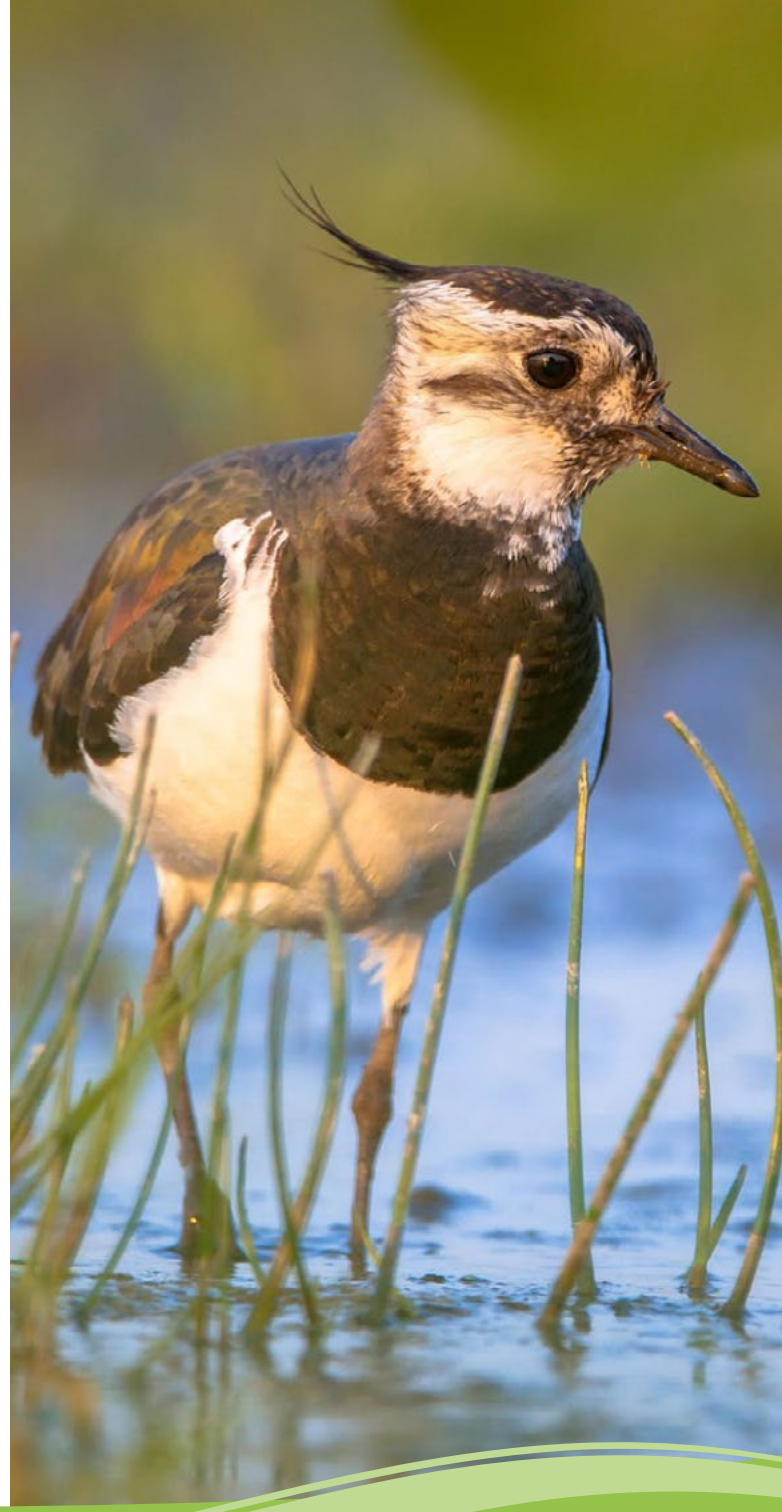
- A farmland bird assemblage, including now rare and scarce species such as Grey Partridge, Corn Bunting, Tree Sparrow, Turtle Dove and Yellow Wagtail.
- Curlew and Lapwing in the Trent Valley.
- So-called 'arable weeds', including Thorow-wax, Corn Chamomile, Henbane, Corn Buttercup, Shepherd's Needle and Night-flowering Catchfly.
- Invertebrates including Necklace Ground Beetle and the moths Small Eggar and Scarce Vapourer.

3.7.4 Prospects for recovery and current initiatives

Environmental stewardship schemes, adequately resourced and efficiently administered, are the key mechanism for recovering nature on farmland habitats (including orchards). Improving the condition and increasing the extent of hedgerows is a particular opportunity.

There are a number of current or recent initiatives within the LNRS area which benefit farmland habitats and associated species, including:

- Government agri-environment funding via Countryside Stewardship (gov.uk) and the Sustainable Farming Incentive (gov.uk)for habitat creation, maintenance and management.
- The Guardians of Sherwood (farmclusters.com), a farm cluster covering over 10,000 hectares in Sherwood, looking to create and restore on-farm habitats, increase farmland bird populations and address water quality issues.
- FarmEco Community Farm (farmeco.co.uk) at Screveton, a small mixed agroforestry farm producing food to organic standards and undertaking education, health and wellbeing and conservation volunteering activities.
- The Nature Recovery Networks in Farmed Landscapes (nottinghamshirewildlife.org) project (funded by Severn Trent and delivered by Nottinghamshire Wildlife Trust), aiming to create new and enhance existing habitats within the farmed environment.
- Severn Trent's Environmental Protection Scheme (stwater.co.uk) grant programme, delivered by Nottinghamshire Wildlife Trust and funding interventions for water quality and nature across to particularly tackle pesticides in drinking water boreholes.
- Sherwood's Landscape of Trees and Hedges (miner2major.nottinghamshire.gov.uk) project, delivered through the Miner2Major Landscape Partnership Scheme, which surveyed and then made management recommendations for these habitats in



3.8 Neutral and calcareous grasslands

The vast majority of Nottinghamshire's grasslands have been agriculturally improved through the addition of fertiliser, the use of herbicide, or re-seeding with Perennial Ryegrass, and the oft-cited figure of a 97% loss of species-rich grassland nationally between 1930 and 1984 is undoubtedly reflected locally, with further losses since - either through direct loss or as a result of a cessation of suitable management.

As a result, grasslands of higher botanical value in the county are scattered in distribution and small in size. Such grasslands, which may be neutral or calcareous in nature, can be species-rich, and may be grazed or cut for hay, but many have become small, pony-grazed paddocks (usually in poor condition). Semi-improved grassland which retains some degree of botanical diversity despite previous 'improvement' is widely distributed across the county, albeit in small patches, whilst truly species-rich or unimproved grassland is infrequently encountered. However, accurate figures for the extent of this habitat are not available.

Lowland calcareous grassland has a much more restricted distribution, being associated with the limestone geology of the west of the county, plus isolated pockets elsewhere where localised geology allows (e.g. associated with gypsum workings in the south and east of the County). Nottinghamshire Biodiversity Action Group figures suggest that only around 200 hectares of this habitat persist. Calcareous grasslands are particularly important for their botanical interest, supporting a range of rare or uncommon species.

Areas of rough grassland, which are less botanically rich and dominated by coarse grasses, may develop where more diverse grasslands have ceased to be managed, or where arable farmland has been abandoned, although the most extensive areas are actually located on former mineral workings. Such areas are often seen as 'wasteland', but in fact they can support relatively high densities of breeding birds and other wildlife, and a lack of management allows natural processes such as vegetation succession to take place, with scrub developing and adding further interest and diversity.

For further information see the Local Biodiversity Action Plans for Lowland neutral grassland (nottsbag.org.uk) and Lowland calcareous grassland (nottsbag.org.uk).

3.8.1 Species of importance

A number of species or groups of species associated with neutral and calcareous grassland habitats are of particular significance in the LNRS area, and some at a national level. These include:

- Notable plant species including Frog Orchid, Green-winged Orchid, Spring Crocus and Autumn Crocus.
- Bryophytes in calcareous grasslands including Giant Spearmoss, Compact Feather-moss, Inclined Distichium, Slender Distichium and Lime Entodon Moss.

3.8.2 Prospects for recovery and current initiatives

The ability to increase the extent of calcareous grassland in Nottinghamshire is restricted by geology, and the most significant opportunities are limited to a limited number of mineral workings. Neutral grassland is more readily recoverable, including through environmental stewardship, both through creation and enhancement of existing grasslands.

There are a number of current or recent initiatives within the LNRS area which benefit neutral and calcareous grassland habitats and associated species, including:

- Habitat creation on former colliery and quarry sites in the west of Nottinghamshire as part of site restoration through the planning system.
- A landfill tax-funded project to restore calcareous grassland sites under the management of Nottinghamshire County Council.
- Nottinghamshire County Council's Notified Road Verge scheme manages a small number of road verges for their botanical interest.
- Since 2019, Rushcliffe Borough Council have hired a remote mowing machine to carry out grassland management at sites (particularly with challenging topography) across the Borough, including those managed by volunteer groups.

3.9 Urban and post-industrial habitats

Urban and built-up land in Nottinghamshire (loosely defined here as the county's city, towns and larger villages and large industrial sites such as power stations) covers approximately 32,000 hectares, or around 124 square miles - nearly 15% of the county's area. Foremost amongst these is Greater Nottingham (comprising of the city plus its suburbs, including Arnold, Carlton, West Bridgford, Beeston, Stapleford and Hucknall). Outside of Greater Nottingham, much of the county's urban population is concentrated to the west, in the towns of Mansfield, Sutton-in-Ashfield, Kirkby-in-Ashfield, Eastwood and Kimberley. Towards the north of the county are Worksop and Retford, to the east is Newark-on-Trent, in the south are Bingham, Radcliffe-on-Trent, Cotgrave and Keyworth, whilst Ollerton and Southwell are located centrally.

Depending on the age and quality of housing stock, residential areas can provide important breeding sites for familiar but declining bird species, whilst gardens (especially those subject to relaxed management) can be surprisingly important for invertebrates, as evidence by the results of moth trapping and other studies. Other features, such as parks, allotments, cemeteries, tree-lined boulevards and other informal green spaces (including canals and lakes) can also all be of value for wildlife, varying with the intensity of use and degree of amenity management.

Even larger buildings and structures, such as those found in Nottingham City Centre, village church spires, and Trent Valley power stations provide opportunities for breeding Peregrines. Black Redstarts previously favoured derelict areas in the centre of Nottingham, although this appears to be lost as a breeding species as these locations have been redeveloped.

As of September 2024, just under 1500 hectares of land is allocated for commercial and residential development (but does not yet benefit from planning permission) in Local Plans, and with increased housing targets announced by the Government in July 2024, more land will need to be made available for development – much of which will need to comply with mandatory requirements to deliver at least 10% Biodiversity Net Gain.

3.9.1 Post-industrial habitats

Post-industrial habitat occurs in both urban and rural areas. Such sites may be found where former industrial buildings have been demolished, for example on abandoned industrial areas or colliery sites, or on disused railway land. Vegetation has re-established naturally at these sites, and active habitat management is normally absent (or limited). The richest post-industrial sites conform to the priority habitat type open mosaic habitat on previously developed land (normally shortened to 'open mosaic habitat'), of which there is around 330 hectares in the county according to Nottinghamshire Biodiversity Action Group figures. Notable sites include disused railway land at Toton Sidings and at Fledborough, and land at the former Gedling, Calverton, Firbeck and Rufford Collieries, although two of the county's richest sites (on colliery land at Steetley and Cotgrave) have been lost in recent years to redevelopment.

A range of substrates, pH, topography and drainage on post-industrial sites, as well as a lack of intensive management, can lead to the development of intricate mosaics of bare and sparsely-vegetated ground, species-rich grassland, scrub, damp areas and standing water. As a result, these sites can be very important for wildlife, particularly plants and invertebrates, although they are often vulnerable to redevelopment due to their status as 'brownfield' land.

For further information see the Local Biodiversity Action Plan for Urban and post-industrial habitats (nottsbag.org.uk).

3.9.2 Species of importance

A number of species or groups of species associated with urban and post-industrial habitats are of particular significance in the LNRS area, some at a national level. These include:

- Invertebrates such as Grizzled Skipper and Dingy Skipper using post-industrial habitats associated particularly with disused railway lines and colliery sites, and Hornet Moth found in urban greenspace.
- Breeding Swifts, Starlings, House Sparrows and House Martins nesting in houses in urban and rural areas, as well as Black Redstart which historically bred in Nottingham City Centre.
- Slow-worms using urban greenspace and post-industrial sites.
- Hedgehogs using urban gardens.
- Deptford Pink on disused railway land.

3.9.3 Prospects for recovery and current initiatives

There are opportunities to enhance the management of public green spaces in urban areas (especially where in public ownership) including through the planting of urban trees, and to support nature-friendly gardening. There are further opportunities to increase the understanding of the importance of brownfield habitats and bring key sites into management, to ensure than new developments have features designed into them to help nature, and to safeguard breeding birds in existing housing stock by raising awareness.

There are a number of current or recent initiatives within the LNRS area which benefit urban and post-industrial habitats and associated species, including:

- University of Nottingham University Park and Jubilee Campus Biodiversity Action Plans, aiming to improve the biodiversity value of the campuses.
- The Grizzled Skipper Project (nottsbag.org.uk) led by Nottinghamshire Biodiversity Action Group, Nottinghamshire County Council and Butterfly Conservation East Midlands, which secured funding to deliver habitat enhancement works at most known Grizzled Skipper sites.
- A project run by Nottingham City Council to reintroduce Autumn and Spring Crocuses at sites within the City.
- Multiple local community initiatives such as Wild NG (wild-ng.uk), Swift Street, Hedgehog Street and Southwell Green Spaces Group, as well as numerous 'Friends of' groups associated with individual sites.
- In 2024, Rushcliffe Borough Council's summer pollinator scheme left grassland at 38 sites uncut between April and August (totalling 3.2ha).

4. Pressures and Opportunities

This section considers anticipated future pressures on nature in Nottinghamshire, broken down into pressures on habitats and species, as well as wider environmental issues, and then identifies broad opportunities for recovering and enhancing biodiversity in Nottinghamshire.

4.1 Anticipated future pressures

The table below sets out anticipated future pressures likely to influence the extent, distribution or quality of different **habitat types** in Nottinghamshire:

Pressure - habitats	Description
Direct loss of habitat	• Loss of habitat to land use change, including for residential and commercial development in urban, urban-fringe and rural areas, minerals, waste and infrastructure projects including linear infrastructure and energy production. • Agricultural changes (e.g. removal of hedgerows, reseeding of meadows). • Loss of riparian habitat due to engineering works (e.g. flood defences). • Other land clearance (e.g. illegal woodland felling without a licence).
Indirect loss /decline of habitat quality	• Lack of appropriate management leading to a reduction in habitat quality and ecological succession (e.g. unmanaged species-rich grassland turning to rough grassland, scrub and eventually secondary woodland), or reduction in woodland management causing loss of structural diversity, open space and edge habitats. • Inappropriate or intensive management leading to a reduction in habitat quality, e.g. regular or inappropriately timed mowing of grassland, overgrazing or excessive dredging of watercourses and removal of deadwood from woodlands. • Changes to agricultural management practices, including changes to cropping practices leading to soil washout and runoff of nutrients. • Artificial lighting and noise from adjacent development. • Recreational impacts (see below). • Habitat changes due to climate change (see below), including through increased risk of drought and fire, or excess water rainfall. • Decline in habitat quality due to the atmospheric deposition of nitrogen causing eutrophication ('fertilisation'-see below under Wider environmental issues). • Pollution to watercourses from point sources and diffuse sources leading to eutrophication (see below under Wider environmental issues). • Changes to hydrology and hydrogeology, leading to damage to water-dependent habitats including through too much and too little water. • Lack of sufficient space to allow natural processes to take place, leading to less diverse habitats. • Using stock (particularly plants seeds) which are not of local provenance in habitat creation and restoration schemes, diluting genetic diversity.
Inappropriate woodland creation	• Pressures to plant new woodland may increase risk of open habitats (e.g. species-rich grassland) being converted to new plantations despite strong regulatory framework; most likely an issue for new woodlands falling below the 0.5ha regulatory threshold. • Poor design (including choice of species or genetic origin of stock) resulting in poor quality habitat and lack of resilience to future climate change and other ecological pressures.
Changes to coniferous woodland management	• Potential loss of open habitat in felling coupes due to shift from cyclical clear-felling to lower impact silvicultural systems (LISS – a type of woodland management involving activities such as group felling and continuous cover). • Potential for further use of novel and non-native species, including species not previously used in county, the risk of spread onto neighbouring sites, and limited wildlife value.

Pressure - habitats	Description
Agricultural intensification	• Increased demands for water. • Increased use of herbicides, pesticides and fertilisers and resultant run-off into watercourses or infiltration into the aquifer. • Novel crops and changes to cropping patterns, such as rapid expansion in maize cropping for anaerobic digesters.
Invasive non-native species (INNS)	• Spread of invasive non-native species (INNS) of plants and animals threatening habitats and native species through changes to habitat quality. • Numerous INNS present in county, including Japanese Knotweed, Himalayan Balsam, Giant Hogweed, Spanish Bluebell, New Zealand Pygmyweed, Floating Pennywort, Turkey Oak, Rhododendron, Chinese Mitten Crab, Muntjac etc., affecting habitat quality.
Invasive native species	• Native species coming to dominate habitats due to lack of management or changing climate, e.g. bracken spreading on heathlands due to increasingly mild winters and eutrophication of habitat.
Missing species	• The past and ongoing loss of multiple species from the county - with others on the brink of extinction – means that we may not be able to recreate the rich functioning assemblages of wildlife needed for healthy, resilient ecosystems, without serious levels of intervention (species range expansion and reintroduction of keystone species).
Pests and diseases	• Spread of pests and diseases including as a result of climate changes and weakened resistance, e.g. increases susceptibility of oaks to Acute Oak Decline due to environmental stresses (including water stress). • Poor biosecurity allowing new pests and diseases to enter the UK, e.g. Chalara ash dieback, the latter likely to lead to significant changes in woodland composition in Nottinghamshire's woodlands, with secondary impact of potentially damaging interventions to remove diseased trees. • Spread of other plant pathogen examples, e.g. Oak Processionary Moth. • Increasing deer and Grey Squirrel populations affecting quality of wooded habitats.
Novel pollutants	• Pollution due to novel materials such as microplastics, PFAS ('forever chemicals'), discarded/lost lithium batteries.
Recreation and disturbance	• Damage to habitats through trampling of vegetation, compaction of soils, erosion of riverbanks etc.. • Illegal off-road vehicles and antisocial behaviour are serious causes of damage and disturbance to sensitive habitats and species (e.g. affecting species like Woodlark and Nightjar in the Sherwood Forest ppSPA). • Secondary issue of flea treatments for dogs polluting waterbodies and dog fouling causing eutrophication of habitats.

Pressure - habitats	Description
Disconnect between people and nature	• Public pressure for 'tidiness' - increased grass cutting and spraying. • Intolerance of wildlife and trees (and other vegetation), especially where these are causing a perceived 'nuisance' or posing a perceived 'hazard'. • Reduced awareness of how to respect the outdoors (e.g. following the Countryside Code). • Use of artificial grass in gardens. • Widespread disregard of requirements to keep dogs on a lead on sensitive sites and lack of understanding of impacts of pets on wildlife and their habitats. • Perceived reduction in volunteer numbers. • Lack of understanding of the threats of climate change and willingness to change behaviours or attitudes to allow essential adaptation to occur.
Capacity, funding, co-ordination, skills and diversity	• Lack of staff capacity in delivery bodies (including statutory agencies, local authorities and eNGOs), with budget pressures further affecting what organisations can deliver. • Insufficient funding to deliver conservation priorities. • Siloed working and lack of a joined-up approach can hinder action. • A shortage of skilled staff, volunteers and training opportunities. • A lack of diversity in the workforce and socio-economic barriers to entering the sector including an expectation that people must do lots of self-funded volunteering before entering paid employment.

Many of the pressures on habitats identified above will also apply to the species that those habitats support; the following pressures additionally apply to **species:**

Pressure - species	Description
Habitat fragmentation	• Loss of habitat resulting in increased habitat fragmentation, reducing ecological connectivity, increasing risk of localised species extinction and reducing likelihood of recolonisation. • Exacerbated by man-made barriers, such as roads, railway lines, urban edges etc. Road widening can substantively increase barrier effects, particularly for large mammals, foraging bats etc..
Loss of habitat heterogeneity	• An effect of reduction in habitat management can be a loss of habitat heterogeneity (i.e. within-habitat variability) upon which many specialist species depend. • A failure to recognise the value of transitional habitats such as scrub with a tendency to manage these habitats out.
Climate change	• Climate envelopes shifting – see below under 'Wider environmental issues'.
Invasive non-native species (INNS)	• Spread of invasive non-native species (animals) threatening native species through competition and disease transmission (e.g. Signal Crayfish vs White-clawed Crayfish) and predation (e.g. American Mink). • Increased between-year survival of non-native species due to milder winters.
Unauthorised releases	• Species introduced at sites without authorisation, masking natural range changes (e.g. due to climate change), potentially causing changes to site management, and potentially affecting local genetic diversity and conservation status of source populations.
Recreation, disturbance and predation by pets	• Increased human disturbance (including noise and visual) displacing sensitive species and/or affecting breeding success, including as a result of new technologies such as drones. • Dogs are a particularly serious issue across many sites in the county, disturbing wildlife, predating ground nesting birds and attacking conservation livestock (constraining conservation management). • Cats are also an issue, predating small mammals and birds particularly in proximity to existing and new dwellings.
Changes to coniferous woodland management	• Coniferous woodland is a significant land use in parts of the county (e.g. Sherwood), and an anticipated move from rotational cropping to continuous cover may detrimentally affect nationally important populations of Woodlark and Nightjar. • Native (obligate) species not adapted to non-native trees.

Pressure - species	Description
Gaps in generations of ancient and veteran trees	• Without older trees to become the next generation of ancient and veteran trees, species reliant on these (such as saproxylic invertebrates) risk local extinction.
River obstructions	• Many rivers and watercourses are in poor ecological condition as a result of centuries of previous interventions including straightening but also through the construction of culverts and weirs which block fish passage.
Illegal persecution and exploitation	• Continued illegal persecution of a number of species including killing of birds of prey, egg collecting, badger baiting, hare coursing. • Illegal fishing (including for Eels) and poaching.
Provisioning	• The widespread feeding of garden birds, whilst a way of the public connecting with nature, contributes to the spread of disease (e.g. Trichomonosis, potentially HPAI) and is also implicated in the decline of species such as Willow Tit due to competition and predation from other species benefitting from feeding. • Provision of nestboxes favouring widespread and common bird species to the detriment of scarcer/specialist species.
Use of herbicides and pesticides	• Lethal and sub-lethal impacts on invertebrate populations, including e.g. as a result of continued derogations for use of neonicotinoids despite very significant environmental impact.

4.2 Wider environmental issues

A number of issues occur as wider environmental issues, operating at a national or international level, some of which the LNRS may be able to address or mitigate against at a local level:

Climate change

The impacts of climate change on the planet and its biodiversity (and people) are predicted to be increasingly severe, with the 1.5°C threshold agreed through the Paris Agreement looking almost certain to be missed. The consequences of climate change ultimately could be catastrophic if left unchecked, but in the short to medium term, it can be expected that climate in Nottinghamshire will experience more regular and extreme heatwaves (with a corresponding increased risk of wildfires and droughts), more regular and severe flooding following more intense spells or rain and more regular and severe periods of high winds.

Changes to our climate are now happening rapidly, giving species and habitats little chance to adapt. As a consequence, many of our current native species will not be able to extend their range to suitable habitat further north with more favourable, cooler climate conditions. In the meantime, some species from currently warmer climates further south may be able to successfully colonise our native species' habitat.

It is considered that there is little that the LNRS can do to address what is a global problem, and which requires concerted action to bring about fundamental systemic changes to how we generate power and produce goods. However, the LNRS can help to mitigate the impacts of climate change locally, particular by ensuring that there is more, better-linked and well-managed habitat, in larger patches across the county, with other appropriate interventions where necessary to increase resilience.

Water quality and quantity

Sewage discharges, urban run-off and agricultural runoff are significant issues hampering the quality of Nottinghamshire's watercourses, and there are also issues with groundwater pollution including through persistent pesticides and heavy metal pollution, including in run-off from restored colliery pit tips which are prevalent in the county.

Water quality will remain a significant issue for the foreseeable future unless significant systemic changes are made at a national level to the way these matters are dealt with, particularly in relation to sewage. It is considered that it is not the role of the LNRS to address this issue.

However, some local interventions may be beneficial, such as encouraging the use of buffer strips along watercourses and SuDs within new developments. It may also include ensuring that the planning system properly considers the scale of sewage and drainage infrastructure necessary to support new (and existing) development, in addition to influencing water abstraction and flood management.

Eutrophication and air quality

The atmospheric deposition of nitrogen (nitrogen oxides and Ammonia) arising from vehicle exhausts, industrial processes, and farming activities on sensitive habitats can result in harmful eutrophication ('fertilising') effects when the so-called critical loads for these habitats are exceeded – that is, when the amount of nitrogen deposited exceeds a threshold above which significant impacts occur. There are also direct and diffuse eutrophication effects form the application of fertilisers and run-off into waterbodies.

Impacts can include the loss of sensitive plant species (and other species that these plants support), increased growth and prevalence of species benefiting from high nitrogen levels, changes to habitat structure and function, and a homogenisation of habitats.

As with water quality and climate change, eutrophication is a national and transnational problem, and whilst some adaption to eutrophication can be made at a local level (e.g. by adapting habitat management practices), it is another issue which in large part goes beyond the reach of the LNRS. However, the LNRS can, through its interaction with the planning system, influence the scale and siting of new developments and ensure that the impacts of nitrogen deposition are properly considered as part of planning decisions.

Competing land use pressures

There are increasing pressures on land in Nottinghamshire, including for food production, energy generation (e.g. solar farms), woodland creation (including for carbon offsetting), off-site biodiversity gain sites (for Biodiversity Net Gain) and development for housing, employment, infrastructure and recreation.

Proper planning, e.g. through a national land-use strategy is required, but the LNRS has a role to play in identifying both the most important existing places for wildlife (where damaging land-use changes must be avoided), and in identifying the places of greatest importance for delivering nature recovery. It should be recognised that competing land-uses are not necessarily mutually exclusive, for example areas created for habitat could still be used for food production through the use of livestock for conservation grazing, and similarly the co-location of solar farms, grazing and habitat creation.

4.3 Opportunities

This section identifies the broad opportunities for recovering and enhancing biodiversity in Nottinghamshire, grouped by themes and with reference to relevant plans and strategies; note that some opportunities are applicable to more than one theme, but have been placed in the most relevant.

Theme	Opportunity	Link to other relevant plans, policies and strategies
Planning and development	Mandatory **Biodiversity Net Gain (BNG)** – all applicable developments to deliver a minimum 10% net gain from February 2024 (for major developments), April 2024 (for minor developments) and November 2025 (for Nationally Significant Infrastructure Projects), with off-site and significant on-site gains to be legally secured for 30 years. The LNRS will help prioritise the location of off-site biodiversity gain sites to ensure these are strategically located and deliver maximum benefits for nature recovery, and there is an opportunity for a locally shared approach to BNG in Nottinghamshire including requiring 20% net gain where feasible.	▸ Biodiversity net gain (gov.uk) ▸ A Biodiversity Net Gain Framework for Nottinghamshire and Nottingham (nottinghamcity.gov.uk) ▸ SPDs and other supporting documents in preparation or adopted by some LPAs
	Large-scale creation of priority habitats through **restoration of quarries**, particularly in the Trent and Idle Valleys but also in other parts of the county across a range of mineral types.	▸ Nottinghamshire Minerals Local Plan (nottinghamshire.gov.uk) (Policy SP2 - biodiversity-led restoration)
	Implementation of **national and local planning policy** relating to: • protecting and enhancing sites, habitats and species • incorporating specific features for biodiversity into developments • adapting to and mitigating the impacts of climate change • delivering accessible green space and Green Infrastructure (see below under 'Accessible greenspace' • nature-based solutions including Natural Flood Management • ensuring that infrastructure for waste and surface water in all new developments is appropriately designed for current and future climate change predictions	▸ National Planning Policy Framework (gov.uk) ▸ Planning practice guidance (gov.uk) ▸ Local plans, neighbourhood plans and other supplementary planning documents, strategies, assessments or local guidance) for: strategies, assessments or local guidance) for: • District / Borough Councils • Nottingham City Council • Nottinghamshire County Council • Town and parish councils (or other qualifying body for leading neighbourhood planning ▸ Local Transport Plans for Nottinghamshire and Nottingham
	Use of **Sustainable Urban Drainage Schemes (SuDS)** in developments to manage water and provide habitat, to deliver multiple benefits.	▸ Sustainable drainage systems: non-statutory technical standards (gov.uk)
	Nationally Significant Infrastructure Projects and other growth and development projects – an opportunity to think strategically about BNG and nature's recovery for larger schemes (including solar and electricity transmission) and to maximise biodiversity outputs.	▸ Find a National Infrastructure Project (planninginspectorate.gov.uk) ▸ East Midlands Combined County Authority (eastmidlands-cca.gov.uk) ▸ Inward Investment Framework 2023 (PDF) (nottinghamshire.gov.uk)

Theme	Opportunity	Link to other relevant plans, policies and strategies
Accessible greenspace	New and enhanced habitat to provide **accessible green space to benefit the health and wellbeing of communities,** including as delivered through planning and BNG, woodland creation schemes and as part of agri-environment schemes, providing signage and interpretation where beneficial and linking into existing access routes, but recognising that not all new or existing areas of habitat are suitable for public access, or increased levels of access.	▸ Green Infrastructure Standards (naturalengland.org.uk) ▸ Woodland Access Implementation Plan (gov.uk) ▸ Nottingham Greenspace Strategy (nottinghamcity.gov.uk) ▸ Other local authority Green Infrastructure Strategies and organisational green space / parks strategies ▸ Joint Health and Wellbeing Strategy for Nottingham (PDF) (nottinghamcity.gov.uk) ▸ Rights of Way Management Plan 2018-2026 (PDF) (nottinghamshire.gov.uk) ▸ Nottinghamshire Joint Health and Wellbeing Strategy (PDF) (nottinghamshire.gov.uk).pdf
	Green Infrastructure Standards – Natural England's Urban Nature Recovery Standard seeking 1ha of Local Nature Reserve (LNR) per 1000 of population in urban and urban fringe areas, to provide new areas for wildlife and the quiet enjoyment of nature; also Woodland Trust's Woodland Access Standard.	▸ Urban Nature Recovery Standard S3 (PDF) (naturalengland.org.uk) ▸ Woodland Access Standard (PDF) (woodlandtrust.org.uk)
Habitat creation and enhancement	**National 30by30 targets** (protecting 30% of the UK's land by 2030) should help drive the meaningful protection of additional sites in the county including in Protected Areas and through Other Effective Conservation Measures.	▸ 30by30 on land in England (gov.uk)
	Changes to **management of public land** (including parks, cemeteries, road verges) and other land (such as churchyards) to reduce intensity of management (e.g. reducing grass cutting) to deliver cost savings and habitat enhancements	▸ B-Lines (buglife.org.uk) ▸ Managing Road Verges and Green Spaces (plantlife.org.uk)
	Funding opportunities, including through Green Finance and Carbon Credits and from grant making bodies and charitable foundations. Strong partnerships are already in place to allow work on large-scale nature recovery projects.	
	Delivery of **conventional conservation management** to improve condition of sites and the habitats they support, including heathlands, grassland and wetlands, subject to adequate resourcing being available.	
	Rewilding as an approach to managing land using natural processes to achieve habitat and species diversity, whilst reducing management costs and engaging with the public.	▸ Rewilding and conservation (rewildingbritain.org.uk)
	Conservation and land management activities as a means of helping to store carbon and help reduce the magnitude of climate change impacts, including through woodland creation, peat restoration and rewetting, creation of species-rich grassland, the use of extensive habitat management through large herbivores, and the use of cover crops and herbal leys.	

Theme	Opportunity	Link to other relevant plans, policies and strategies
Habitat creation and enhancement	**Existing local frameworks and targeting tools** available to guide nature recovery and target habitat creation and enhancement to the best locations in the short and longer term.	Nottinghamshire Local Biodiversity Action Plan (nottsbag.org.uk) Nottinghamshire Biodiversity Opportunity Mapping (nottsbag.org.uk) Living Landscapes (PDF) (wildlifetrusts.org) A Vision for the Future of Sherwood Forest (PDF) (sherwoodforest.org.uk) Rushcliffe Nature Conservation Strategy (rushcliffe.gov.uk) Bigger and Better - giving nature a home in the Trent Valley: Newark to South Clifton Concept Plan (PDF) (afterminerals.com)
	Making Nottinghamshire a more attractive place, supporting the visitor economy and encouraging inward investment and green growth.	Visitor Economy Strategy 2019-2029 (PDF) (nottinghamshire.gov.uk) Visitor Economy Framework 2022 (PDF) (nottinghamshire.gov.uk)
Farming and land management	Payments for environmental goods and services - Environmental Land Management (ELM) scheme **Sustainable Farming Incentive** (SFI): payments to farmers to carry out activities in a more environmentally sustainable way alongside food production.	Environmental Land Management (ELM) (gov.uk)
	Payments for environmental goods and services - Environmental Land Management (ELM) scheme **Countryside Stewardship** (CS): payments for targeted actions relating to specific locations, features and habitats, with CS Plus allowing land managers to join across areas to deliver bigger and better results.	Environmental Land Management (ELM) (gov.uk)
	Payments for environmental goods and services - Environmental Land Management (ELM) scheme **Landscape Recovery** (LR): payments for bespoke, longer-term, large-scale projects to enhance the natural environment.	Environmental Land Management (ELM) (gov.uk)
	Other **Green Finance schemes**, **carbon credits, nutrient offsetting** and emergence of **blended finance opportunities** (to also include BNG, ELM, NFM).	Green finance strategy (gov.uk)
	Other funding schemes - which can create new habitats, bring habitats into management and promote regenerative agriculture. Habitat creation can be funded through e.g. Nature Recovery in Farmed Landscapes, ST STEPS grant, Peatland Restoration funding and other local schemes (e.g. Miner2Major).	
	Regenerative agriculture - a way to help biodiversity, protect and conserve soils and water, reduce pollution and store carbon (e.g. through adoption of cover crops and herbal leys, rewetting of peat soils, wetland creation).	
	Agroforestry – an approach to land management that combines agriculture and forestry to create diverse and productive pastoral and arable landscapes, with benefits for soils, carbon and water, whilst improving yields and mitigating the impacts of climate change.	

Theme	Opportunity	Link to other relevant plans, policies and strategies
Forestry and woodland management and creation	**Creation of new woodland** by planting or natural colonisation to help meet national woodland creation targets, create new wildlife habitat, expand accessible green spaces, help meet net zero targets, reduce flood risk, improve air quality, reduce urban heating and create jobs. Including through new mechanisms to deliver woodland creation such as Woodland Creation Partnerships and more attractive woodland creation funding offers, and through the establishment of diverse planting that is robust to pests and diseases and climate change. Potential for species/genotypes of a more southerly distribution to allow adaptation of woodlands to a hotter climate	▸ England Trees Action Plan 2021 to 2024 (gov.uk) ▸ England Woodland Creation Offer (gov.uk) ▸ Strategic Plan for Greenwood (2000) (PDF) (greenwoodforest.org.uk) ▸ Midlands Forest Network (midlandsengine.org) ▸ Local authority Tree Strategies
	Safeguarding ancient woodland and trees and bringing existing woodlands into management to enhance habitats and reverse species declines, but also to support economic activity through wood products (e.g. timber and coppice materials) and job creation, including through new incentives.	▸ Woodland Management Plan grants 2024 (gov.uk) ▸ Keepers of time: ancient and native woodland and trees policy in England (PDF) (gov.uk) ▸ Sherwood Treescape (Woodland Trust)
	Adoption of techniques to promote the man-made **veteranisation of trees** to help fill the missing cohort of ancient trees in the landscape, and using orchard trees as a tool for bridging recruitment gaps.	
Watercourses and wetlands	Adoption of **Natural Flood Management (NFM)** approaches as a means of helping to manage flooding whilst also creating habitat, using processes to protect, restore and mimic the natural functions of catchments and floodplains to slow and store water, including by reconnecting rivers to their floodplains.	▸ Natural flood management programme (gov.uk) ▸ Nottinghamshire Local Flood Risk Management Strategy 2021-27 (PDF) (nottinghamshire.gov.uk) ▸ Nottingham Local Flood Risk Management Strategy 2015 (PDF) (nottinghamcity.gov.uk)
	Catchment Sensitive Farming as an approach to land management that protects water, air and soil, including in relation to soil management; nutrient, slurry, and manure management; ammonia emission reduction; farm infrastructure and machinery set-up; pesticide handling; water resources and natural flood management; and land management.	▸ Catchment Sensitive Farming (gov.uk)
	Water Framework Directive (WFD), river basin planning and regional water resources plans, which seek to establish an integrated approach to the protection and sustainable use of the water environment.	▸ River basin planning process overview (gov.uk) ▸ Humber river basin district river management plan (gov.uk) ▸ Regional Water Resources Plan for Eastern England (wre.org.uk)
	River restoration and channel naturalisation, including through two existing Catchment Partnerships which engage a range of stakeholders, and through projects such as the Notts Three Rivers Restoration Project and installation of new fish passes on the Trent. Partnership working can continue to help address water quality issues including through land management advice, good practice demonstration etc.	

Theme	Opportunity	Link to other relevant plans, policies and strategies
Species recovery, reintroductions and INNS	An active **Notts Species Recovery Working Group** has identified a framework for the recovery and reintroduction of key species in the county.	▸ Species Recovery Framework (not available online)
	Species range expansion and reintroduction projects being developed and delivered by a range of partners, e.g. enclosed Beavers (with a suitable wild reintroduction location now being explored), Water Voles, Silver-studded Blues and Adders as an opportunity to: • re-establish keystone and flagship species • establish more robust and adaptable ecosystems • engage the public • support the visitor economy	
	Active partnerships and projects **tackling invasive non-native species (INNS)**, including in relation to Himalayan Balsam, Japanese Knotweed, Signal Crayfish and American Mink, and the development of new techniques (e.g. eDNA monitoring, remote monitoring of traps).	▸ GB Invasive Non-native Species Strategy 2023-2030 (nonnativespecies.org)

Theme	Opportunity	Link to other relevant plans, policies and strategies
Community and local action	Local authorities and other organisations recognising the climate and nature crises and driving local action to reduce carbon emissions and reach net zero (including through the adoption of nature-based solutions), as well as the importance of access to nature in place making.	▸ Economic Transition Plan 2022-2025 (PDF) (nottinghamshire.gov.uk) ▸ Nature Positive Universities (naturepositiveuniversities.net) ▸ Transforming our towns and city for people and nature (PDF) (nottinghamshirewildlife.org) ▸ Creating a Wilder Nottinghamshire by 2030 (PDF) (nottinghamshirewildlife.org) ▸ Nottinghamshire Net Zero Framework (in prep.) ▸ Other local authority plans/strategies and neighbourhood plans relating to climate change, the environment and place.
	Volunteering opportunities as a way for people to engage with their local environment, including through site-based habitat management works and species recording, which benefit biodiversity but also help deliver health and wellbeing benefits through exercise and contact with nature. A number of Friends groups exist across the county, supported by a range of partners.	▸ Local Authorities and Community Groups (nottsbag.org.uk)
	Well-developed **citizen science and recording** programmes providing valuable data on a range of species, whilst also engaging people with the natural world.	
	Increasing interest in and awareness of **wildlife gardening** as a means of providing havens for wildlife in urban areas.	
	High-profile **environmental campaigns** and campaigners, at a local, national and international level, inspiring local action to protect local places and demand positive changes benefitting nature and the wider environment.	
Data and evidence	**Better data, evidence and tools** allowing advocacy and improved decision making, including in relation to environmental equity.	
	Use of technology including Artificial Intelligence and bioacoustics to improve e.g. recording and monitoring of species/habitats.	

5. Priorities and Potential Measures

5.1 Background

This section of the LNRS identifies the **Priorities** for recovering or enhancing biodiversity within Nottinghamshire and Nottingham (taking into account the contribution that this can also make to other environmental benefits), and the **Potential Measures** (actions) that can be taken to deliver those priorities. The following definitions are used:

- **Priorities are** *"the end result that the strategy is seeking to achieve";* in most cases these are relevant to habitats, or species. Priorities generally do not include site-level locations, and reflect local circumstances, including the most important issues to local people and organisations.
- **Potential Measures** are *"specific practical actions to achieve the priorities"*; they are suggested activities that benefit a particular habitat or species or provide wider environmental benefits, and help to deliver the agreed priorities.

The Priorities and Potential Measures were developed in consultation with a range of stakeholders, and further information about the process that was followed can be found in **Appendix 3**. A manageable number of **Priorities** have been identified, which:

- Address the Pressures and Opportunities identified for the LNRS area, including those that are most urgent.
- Contribute to relevant National Environmental Objectives (NEO)s[40] for the strategy area (see **Appendix 4** for the list of NEOs).
- Focus on the habitats and species for which the strategy area is particularly important.
- Provide other environmental benefits and/or are nature-based solutions (see section 2.5).
- Sufficiently cover the variation of landscapes and ecosystems in the LNRS area.

At the same time, **Potential Measures** were also developed which:

- Are ways of enhancing existing habitats and creating new habitats.
- Are practical, realistic and deliverable.
- Provide enough detail so that their purpose can be understood, but not be detailed instructions – recognising that further guidance or instructions should be sought (if necessary).
- Recognise that benefits will depend on precisely how, when and where an action is carried out.
- Are shaped so that they will deliver a range of other benefits.

Priorities and Potential Measures relating to species/species assemblages were developed through a separate process with input from a range of species specialists and recorders. Further details about this process can again be found in **Appendix 5.**

40 The National Environmental Objectives are the national targets set under the Environment Act (2021) and the additional commitments from the Environmental Improvement Plan (2023).

5.2 How to use the list of Priorities and Potential Measures

Table 2 lists all the Priorities and Potential Measures which have been identified for the LNRS area. In this table:

- An overarching set of Priorities and Potential Measures are provided which are more general in nature and which are applicable across all habitats and parts of the LNRS area.
- The remaining Priorities and Potential Measure are grouped together in broad habitats, and each is given a unique code so they can be identified.
- The applicable Priority Habitat types (and other habitat types) are identified for each of the broad habitat groupings.
- A general description is given of the geographical area that the Priorities and Potential Measures apply to.
- The Priorities and Potential Measures relating to individual species and species assemblages are placed in the most relevant habitat (noting that some species may occur in more than one habitat).
- Some of the Potential Measure are duplicated across different groupings of Priorities, where they help to achieve multiple priorities for different habitats.

Regarding the last bullet point, it is important to note that some Potential Measures can achieve multiple Priorities, and that different Potential Measures can contribute to the same Priority. A detailed matrix (in spreadsheet format) which captures these links back and forwards between Priorities and Potential Measures within the same habitat grouping, and between different habitat groupings, is included in **Appendix 3**. This matrix also identifies links to the National Environmental Objectives, and where Priorities and Potential Measures have other benefits or provide nature-based solutions.

Finally, the broad habitat groupings relating to Farmland and Urban and Post-industrial include a number of unique Priorities and Potential Measures, but by virtue of the fact that the farmed and urban environment supports many (if not all of) the habitats covered in the other broad habitat groupings, many of the Potential Measures for those habitats apply. However, to keep the list of Potential Measures for Farmland and Urban and Post-industrial manageable, only what are considered to be the key and most relevant Potential Measures from other broad habitat groupings are listed. Therefore, and as an example, if a farmer is looking to create or enhance woodland on their land, they should look at the Priorities and Potential Measures for Woodland, as well as those for Farmland.

5.3 Supporting actions

During development of the Potential Measures, a number of actions emerged which are considered out of scope of the LNRS, as they are either not 'practical actions' or they are (or should be) delivered through other mechanisms. Nevertheless, these are important for the protection, enhancement and recovery of nature in the LNRS area, and are listed in **Table 3**.

Table 2 – Priorities and Potential Measures for the Nottinghamshire and Nottingham LNRS

A - Overarching Priorities and Potential Measures			
Priority Habitats covered:	All	Other habitats covered:	All
Geography:	Across the LNRS area	Other benefits provided:	Recreation, economy, education

Code	Priorities
A/P1	Habitats, sites and landscapes managed in a way which allows **space for natural processes** (such as herbivore grazing, establishment of woody vegetation and meandering of rivers) to take place, where appropriate.
A/P2	**Enhanced ecological connectivity** between sites and habitats and across landscapes (including urban green and blue infrastructure in urban areas) to reduce fragmentation and allow movement of species in the face of climate change.
A/P3	Management and (where possible) **eradication of invasive non-native animal and plants species** (INNS) in terrestrial and aquatic environments.
A/P4	**Reduced ecological fragmentation** caused by new and existing transport infrastructure.
A/P5	**Maximised biodiversity benefits arising from large-scale and strategic development** including renewable and low carbon energy generation infrastructure and other Nationally Significant Infrastructure Projects (NSIPs).
A/P6	**Increased populations of pollinators and other invertebrates.**

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
A/M1	Where appropriate, allow complex and dynamic mosaics of habitats to develop in particular in the transition zones between different habitats ('ecotones'), using a variety of techniques to achieve this including allowing natural establishment of woodland and scrub and the use of grazing animals and other ecosystem engineers.	✓
A/M2	Target habitat enhancement and creation in areas where this will reduce fragmentation and increase ecological connectivity, through the creation of linkages, corridors and stepping stones.	
A/M3	Works to control Invasive Non-native Species (INNS), including by ensuring early intervention and a landscape approach, using biological control where available.	
A/M4	Installation and retrofitting of features to reduce fragmentation caused by roads and railways, including underpasses and green bridges at key locations.	
A/M5	Strategic habitat creation as part of large-scale development, creating more habitat and better ecological connectivity at a landscape-scale.	
A/M6	Creation of features to benefit pollinators and other invertebrates as part of habitat enhancement and creation projects, including habitat mosaics, sources of pollen and nectar (flowers), deadwood, wet/damp areas, bare ground and both very short and uncut grass.	✓

B - Woodland Priorities and Potential Measures	
Priority Habitats covered:	Lowland mixed deciduous woodland (including oak-birch woodland and ash-dominated woodland), wet woodland, wood pasture and parkland.
Other habitats covered:	Planted coniferous woodland, other broadleaved woodlands, scrub, ancient and veteran trees.
Related habitats:	N/A
Geography:	Across the LNRS area
Other benefits provided:	Cleaner water, cleaner air, healthier soils, climate regulation, flood mitigation, recreation, economy, education

Code	Priorities
B/P1	**Improved ecological condition** of existing lowland mixed deciduous woodlands and other woody habitats, including Ancient Woodlands, to enhance biodiversity and increase resilience to climate change.
B/P2	**Increased size and extent** of woodlands and woody habitats, particularly in areas where this will provide other benefits and nature-based solutions.
B/P3	**Increased resilience** of woodlands and trees to pests and diseases.
B/P4	Better protection of ancient and veteran trees, and future AVTs, including those in the wider countryside outside woodlands.
B/P5	Improved conservation status of **Woodland species assemblage.**
B/P6	Improved conservation status of **Woodland (Sherwood) species assemblage.**

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
B/M1	Bring more woodlands and other woody habitats into positive management across the strategy area, following the UK Forestry Standard.	
B/M2	Increase structural diversity in woodlands and other woody habitats including by (re-) establishing rides, glades and ecotones, coppicing coupes, promoting a greater age range of trees and diversity of canopy structures, and retention/creation of standing and fallen deadwood.	
B/M3	Accelerate the restoration of Plantation on Ancient Woodland Sites (PAWS) to native broad-leaved woodland via a phased programme of felling and replanting, or natural regeneration.	
B/M4	Plant and allow natural establishment of woodlands and other woody habitats at appropriate locations using the UK Forestry Standard to guide design, focussing on the woodland landscapes of the Greenwood Community Forest area, Sherwood Forest and the Mercia Mudwoods, ensuring the right tree in the right place, for the right reason, and maximising co-benefits including in relation to water management.	
B/M5	Establish new wet woodlands at appropriate locations, particularly along watercourses and elsewhere that hydrological conditions allow.	
B/M6	Establish new areas of wood pasture and parkland at appropriate locations, including through the restoration of former areas of this habitat.	
B/M7	Plant new woodlands and diversify existing woodlands with a wider range of locally-appropriate tree and shrub species (potentially including the use of genetic stock of a more southerly origin), especially to mitigate the effects of Chalara Ash Dieback.	
B/M8	Establish woodland ground flora in newly planted woodlands through seeding where appropriate, including at later stages of woodland establishment when soil nutrient levels have reduced.	
B/M9	Bring Ancient and Veteran Trees into favourable management including through use of specialist management techniques, and where appropriate apply veteranisation techniques to develop successor trees to ensure a continuity of habitat.	
B/M10	Undertake co-ordinated landscape-scale deer and squirrel management (potentially including through natural predation) to reduce grazing pressure and tree damage, thereby promoting structural diversity and natural regeneration.	
B/M11	Sensitively manage Ash within and out with woodlands to identify and retain trees showing resistance to Chalara dieback, and where there are safety risks or high impacts of dieback develop a programme of planned replacements to ensure continuity of tree cover.	
B/M12	Use large herbivores such as Bison (or proxies) to implement natural processes, along with other species such as Beavers, Pigs and potentially Elk, where appropriate and properly controlled (including in conjunction with deer management).	
B/M13	Support a network of local native tree nurseries, promoting the use of seed from existing ancient woodland sources and verified biosecurity measures.	

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
C/M2	Work to implement natural flood management measures which work with natural processes to reduce flood risk whilst also improving biodiversity through habitat creation and water quality improvements.	
C/M6	Establish a mix of shading conditions along watercourses to reduce water temperatures, through management of existing trees and establishment of new trees and woodland.	
G/M4	Create new wetlands, heathlands, grasslands and woodlands and other woody habitats within the farmed landscape, where circumstances permit, including as part of farm diversification schemes (such as energy development).	
G/M6	Improve the management of the existing hedgerow and hedgerow tree resource, through gapping up, coppicing/laying, rotational cutting and late cutting, and retention of grassed buffer strips.	
G/M8	Bring traditional orchards back into management and create new traditional orchards.	
H/M2	Carry out wildlife-friendly management of public green spaces (including parks, allotments, churchyards and cemeteries, road verges, walkways, watercourses and woodlands), including by relaxing mowing regimes, establishing wildflower grasslands, planting native trees and shrubs, and creating ponds.	
H/M7	Plant native and wildlife-friendly trees and shrubs (providing nectar, pollen, berries) in the gardens and landscaping areas in new developments, to provide nectar, pollen and berries for a range of pollinators and birds.	
H/M11	Plant new trees and retrofit 'missing' trees (i.e. empty tree pits) into existing streetscapes and green spaces following well-designed schemes using suitable species, including fruit trees where appropriate, to address tree inequity (as measured against Woodland Trust's Tree Equity Score the to help meet Green Infrastructure Standards), ensuring proper establishment to minimise failures.	
H/M12	Plant new small-scale woodlands in appropriate locations.	

C - Watercourse Priorities and Potential Measures	
Priority Habitats covered:	Rivers
Other habitats covered:	Streams and canals
Related habitats:	Woodland, wetland and grassland habitats where these occur along watercourses
Geography:	Across the LNRS area
Other benefits provided:	Cleaner water, flood mitigation, recreation, economy, education

Code	Priorities
C/P1	**Improved ecological status and condition** of all waterbodies to meet River Basin Management Plan (RBMP) objectives, working at a catchment scale, to enhance biodiversity and increase resilience to climate change.
C/P2	**Enhanced physical and ecological connectivity** along watercourses
C/P3	**Watercourses restored** to a more natural state were appropriate and as opportunities arise, including through floodplain reconnection, especially where this provides flood risk management.
C/P4	Improved conservation status of **River species assemblage**

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
C/M1	Use nature-based solutions (such as reedbeds and SuDS) to reduce impacts of sewage discharges on river water quality whilst also creating habitat.	✓
C/M2	Work to implement natural flood management measures which work with natural processes to reduce flood risk whilst also improving biodiversity through habitat creation and water quality improvements.	✓
C/M3	Work to reduce point sources of pollution to watercourses, including legacy issues associated with coal mines and restored colliery pit tips.	
C/M4	Undertake sensitive land management adjacent to watercourses and within their wider catchments that reduces nutrient inputs, surface run-off and soil erosion, including through the creation of 20m buffer strips along watercourses.	✓
C/M5	Remove or modify artificial barriers to fish passage, such as weirs, or bypass these using fish passes.	
C/M6	Establish a mix of shading conditions along watercourses to reduce water temperatures, through management of existing trees and establishment of new trees and woodland.	✓
C/M7	Undertake favourable management of the riparian zone, including by minimising the impacts of mechanical vegetation clearance and establishing marginal vegetation where absent, where appropriate.	
C/M8	Maintain flows in watercourses prone to low flow including by creating wetland habitats to assist the slow release of water.	

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
C/M9	Renaturalise watercourses where appropriate, including by de-channelising, removing redundant hard engineering, reinstating meanders and braiding (if feasible), and creating backwaters and allowing existing natural processes to continue.	
C/M10	Where appropriate and as opportunities arise, reconnect watercourses with their floodplain by e.g. lowering or removing berms and banks, especially where this has flood management benefits.	
C/M11	Manage canals to ensure they retain water where in danger of drying out.	
D/M2	Deliver nature-based solutions and changes in land management to help reduce the reliance of water abstraction from rivers and groundwater to protect wetland condition.	
D/M3	Where possible and appropriate, reconnect riverine wetlands with their floodplains.	
F/M2	Bring unmanaged and neglected grasslands back into favourable management to increase species diversity, including field margins, buffer strips along watercourses, road verges, railways and amenity grasslands.	
G/M1	Adopt good practice approaches (including Regenerative Farming practices where appropriate) to improve soil health, reduce pesticide/ fertiliser use, reduce soil erosion and improve water and air quality.	
H/M2	Carry out wildlife-friendly management of public green spaces (including parks, allotments, churchyards and cemeteries, road verges, walkways, watercourses and woodlands), including by relaxing mowing regimes, establishing wildflower grasslands, planting native trees and shrubs, and creating ponds.	
H/M8	Install SuDS systems which wherever possible are multifunctional and subject to appropriate maintenance regimes, providing habitat as well as surface water management, including retention basins, bioswales and rain gardens.	
H/M9	Deculvert watercourses where opportunities allow, including as part of redevelopment, and give the daylighted watercourses more space.	
H/M13	Replace paved surfaces (e.g. concrete, tarmac, artificial grass) where possible with vegetation to provide more habitat and allow water infiltration.	
SP/M5	Safeguard long-term future of White-clawed Crayfish in Nottinghamshire by establishing Ark sites and continuing to work to limit the spread of Signal Crayfish in key catchments.	
SP/M6	Implement favourable management of watercourses used by Spined Loach, maintaining dense patches of macrophytes interspersed with open sediment, prioritising the Trent, Idle, Devon and Erewash.	
SP/M7	Establish non-enclosure populations of Beavers at suitable riverine locations in line with IUCN guidelines, working closely with landowners/ managers and local communities, using the best available evidence and following all licencing protocols and guidance on consultation.	
SP/M14	Establish sources of native Black Poplar at local tree nurseries for planting out across the county at appropriate locations, using stock of known genetics and provenance.	
SP/M15	Implement favourable management of watercourses and wetlands supporting or with the potential to support Water Voles, in combination with the control of non-native predators and targeted reintroduction.	

D - Wetland Priorities and Potential Measures	
Priority Habitats covered:	Floodplain grazing marsh (wet grassland), eutrophic standing water, mesotrophic lakes, ponds, reedbed, lowland fen
Other habitats covered:	Marsh and swamp
Related habitats:	Watercourse habitats where these occur in wetlands
Geography:	Across the LNRS area, but focussed on areas associated with major river valleys
Other benefits provided:	Cleaner water, climate regulation, flood mitigation, recreation, economy, education

Code	Priorities
D/P1	**Improved ecological condition** of existing wetlands to enhance biodiversity and increase resilience to climate change.
D/P2	**Increased size and extent** of wetlands especially in areas where this will provide other benefits and nature-based solutions (particularly in relation to water quality, flooding and climate change adaptation).
D/P3	Improved conservation status of **Floodplain grazing marsh species assemblage.**
D/P4	Improved conservation status of **Idle Valley fenland species assemblage.**
D/P5	Improved conservation status of **Pond species assemblage.**
D/P6	Improved conservation status of **Wetland species assemblage.**

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
D/M1	Undertake improved management of wetlands, including through the management of water levels and vegetation.	
D/M2	Deliver nature-based solutions and changes in land management to help reduce the reliance of water abstraction from rivers and groundwater to protect wetland condition.	
D/M3	Where possible and appropriate, reconnect riverine wetlands with their floodplains.	
D/M4	Reintroduce species as ecological engineers to maintain some wetlands through natural processes, where appropriate.	
D/M5	Create new wetlands where hydrological conditions allow, especially through quarry restoration in the Trent and Idle Valleys (focussing on reedbed, marsh and swamp, reedbed and small, shallow lakes), as well as in the Erewash Valley, and where they provide nature-based solutions to flooding and water quality.	
D/M6	Restore and create ponds and ephemeral wetlands in the wider countryside.	
D/M7	Deliver sensitive management and enhancement of lakes (including those created as part of quarry restorations) to increase their biodiversity value, and where possible.	
D/M8	Create new and extensive areas of floodplain grazing marsh (with suitable wetland features) to benefit breeding waders, breeding and wintering wildfowl, invertebrates and plants.	
C/M1	Use nature-based solutions (such as reedbeds and SuDS) to reduce impacts of sewage discharges on river water quality whilst also creating habitat.	
C/M2	Work to implement natural flood management measures which work with natural processes to reduce flood risk whilst also improving biodiversity through habitat creation and water quality improvements.	
C/M8	Maintain flows in watercourses prone to low flow including by creating wetland habitats to assist the slow release of water.	
C/M10	Where appropriate and as opportunities arise, reconnect watercourses with their floodplain by e.g. lowering or removing berms and banks, especially where this has flood management benefits.	
G/M2	Rewet and restore peatland soils through paludiculture and/or habitat creation where appropriate.	
G/M4	Create new wetlands, heathlands, grasslands and woodlands and other woody habitats within the farmed landscape, where circumstances permit, including as part of farm diversification schemes (such as energy development).	
H/M2	Carry out wildlife-friendly management of public green spaces (including parks, allotments, churchyards and cemeteries, road verges, walkways, watercourses, wetlands and woodlands), including by relaxing mowing regimes, establishing wildflower grasslands, planting native trees and shrubs, and creating ponds.	
H/M8	Install SuDS systems which wherever possible are multifunctional and subject to appropriate maintenance regimes, providing habitat as well as surface water management, including retention basins, bioswales and rain gardens.	

E - Heathland Priorities and Potential Measures	
Priority Habitats covered:	Lowland heathland, lowland dry acid grassland
Other habitats covered:	N/A
Related habitats:	N/A
Geography:	The Sherwood NCA and the coversands around Spalford/Girton
Other benefits provided:	Climate regulation, recreation, economy, education

Code	Priorities
E/P1	**Improved ecological condition** of existing heathlands and acid grasslands to enhance biodiversity and increase resilience to climate change.
E/P2	**Increased size and extent** of heathlands and acid grasslands, particularly in areas this will provide other benefits and nature-based solutions.
E/P3	Improved conservation status of **Heathland species assemblage.**

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
E/M1	Undertake rotational management of heathlands and acid grasslands to control bracken and provide a mosaic of habitat including open areas, bare ground, scrub and trees.	
E/M2	Use an appropriate mix of grazing animals for long term management, including large herbivores, pigs and sheep, especially using native/ traditional breeds.	
E/M3	Undertake restoration of heathland and acid grassland from conifer plantations where this habitat previously existed and is recoverable, where appropriate, following the government's Open Habitats Policy.	
E/M4	Undertake creation of new heathland and acid grassland in Sherwood and on the windblown sands in north-east Nottinghamshire, including as part of quarry restoration and on low value arable land (where appropriate).	
E/M5	Use local donor sites as sources of heather brash for seeding to retain local distinctiveness and seek the expansion of other characteristic heathland plant species.	
G/M4	Create new wetlands, heathlands, grasslands and woodlands and other woody habitats within the farmed landscape, where circumstances permit, including as part of farm diversification schemes (such as energy development).	
H/M2	Carry out wildlife-friendly management of public green spaces (including parks, allotments, churchyards and cemeteries, road verges, walkways, watercourses, wetlands and woodlands), including by relaxing mowing regimes, establishing wildflower grasslands, planting native trees and shrubs, and creating ponds.	

F - Grassland Priorities and Potential Measures	
Priority Habitats covered:	Lowland calcareous grassland, lowland meadows (lowland neutral grassland)
Other habitats covered:	Other semi-improved grassland
Related habitats:	N/A
Geography:	The Southern Magnesian Limestone NCA and other discrete locations where geology allows (lowland calcareous grassland) and elsewhere across the LNRS area excluding the Sherwood NCA/coversands (lowland meadows)
Other benefits provided:	Cleaner water, climate regulation, recreation, economy, education

Code	Priorities
F/P1	Improve the condition of existing neutral and calcareous grasslands to enhance biodiversity and increase resilience to climate change.
F/P2	Increase the size and extent of neutral and calcareous grasslands, particularly in areas where this will provide other benefits and nature-based solutions.
F/P3	Improved conservation status of **Grassland species assemblage.**

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
F/M1	Undertake favourable management of grasslands of higher botanical diversity to maintain and enhance species diversity.	
F/M2	Bring unmanaged and neglected grasslands back into favourable management to increase species diversity, including field margins, buffer strips along watercourses, road verges, railways and amenity grasslands.	
F/M3	Increase the value of grasslands in public open space, and in other areas such as golf courses and cemeteries, including by relaxing mowing regimes and increasing species richness.	
F/M4	Use an appropriate mix of grazing animals for long term management, paying particular attention to stocking densities and the current habitat condition to ensure optimal management.	
F/M5	Undertake creation of new and locally distinctive species-rich neutral grassland in locations with suitable geology, including on low value arable land (where appropriate).	
F/M6	Undertake creation of new calcareous grassland on the magnesian limestone and gypsum substrate, especially as part of quarry restoration.	
F/M7	Use local donor sites for seed sources to reflect local distinctiveness and avoiding creation of 'generic' neutral grassland using commercial seed mixes.	
F/M8	Retain areas of rough grassland, scrub and habitat mosaics, recognising the value of these for a range of species.	
C/M4	Undertake sensitive land management adjacent to watercourses and within their wider catchments that reduces nutrient inputs, surface run-off and soil erosion, including through the creation of 20m buffer strips along watercourses.	
G/M4	Create new wetlands, heathlands, grasslands and woodlands and other woody habitats within the farmed landscape, where circumstances permit, including as part of farm diversification schemes (such as energy development).	
H/M2	Carry out wildlife-friendly management of public green spaces (including parks, allotments, churchyards and cemeteries, road verges, walkways, watercourses, wetlands and woodlands), including by relaxing mowing regimes, establishing wildflower grasslands, planting native trees and shrubs, and creating ponds.	

G - Farmland Priorities and Potential Measures	
Priority Habitats covered:	Arable field margins, hedgerows, traditional orchards
Other habitats covered:	Arable farmland, improved grassland, ditches
Related habitats:	Woodland, watercourse, wetland, heathland and grassland habitats where these occur on farmland.
Geography:	Across the LNRS area
Other benefits provided:	Cleaner water, cleaner air, healthier soils, climate regulation, flood mitigation, economy, education

Code	Priorities
G/P1	Sustainable and profitable farming which delivers high quality food, improves soil health and water quality, and provides environmental goods and services.
G/P2	Improved condition of existing on-farm habitats and field boundaries to enhance biodiversity and increase resilience to climate change.
G/P3	Create more on-farm habitat, generally locating this on unproductive or marginal land and protecting Best and Most Versatile land for food production, particularly in areas where it will provide other benefits and nature-based solutions.
G/P4	Improved conservation status of **Farmland species assemblage.**
G/P5	Improved conservation status of **Orchard species assemblage.**

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
G/M1	Adopt good practice approaches (including Regenerative Farming and Integrated Pest Management practices where appropriate) to improve soil health, reduce pesticide/fertiliser use, reduce soil erosion and improve water and air quality.	
G/M2	Rewet and restore peatland soils through paludiculture and/or habitat creation where appropriate.	
G/M3	Expand agroforestry as a means to provide resilient, sustainable and more productive food production whilst also providing habitat for wildlife.	
G/M4	Create new wetlands, heathlands, grasslands and woodlands and other woody habitats within the farmed landscape, where circumstances permit, including as part of farm diversification schemes (such as energy development).	
G/M5	Plant new diverse, native hedgerows with hedgerow trees on farmland.	
G/M6	Improve the management of the existing hedgerow resource, through gapping up, coppicing/laying, rotational cutting and late cutting, and retention of grassed buffer strips.	

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
G/M7	Increase in-field options to benefit wildlife, such as field margins, pollinator strips, Lapwing/Skylark plots, beetle banks.	
G/M8	Bring traditional orchards back into management and create new traditional orchards.	
B/M1	Bring more woodlands and other woody habitats into positive management across the strategy area, following the UK Forestry Standard.	
B/M4	Plant and allow natural establishment of woodlands and other woody habitats at appropriate locations using the UK Forestry Standard to guide design, focussing on the woodland landscapes of the Greenwood Community Forest area, Sherwood Forest and the Mercia Mudwoods, ensuring the right tree in the right place, for the right reason, and maximising other benefits including in relation to water management.	
B/M9	Bring Ancient and Veteran Trees into favourable management including through use of specialist management techniques, and where appropriate apply veteranisation techniques to develop successor trees to ensure a continuity of habitat.	
C/M4	Undertake sensitive land management adjacent to watercourses and within their wider catchments that reduces nutrient inputs, surface run-off and soil erosion, including through the creation of 20m buffer strips along watercourses.	
D/M1	Undertake improved management of wetlands, including through the management of water levels and vegetation.	
D/M2	Deliver nature-based solutions and changes in land management to help reduce the reliance of water abstraction from rivers and groundwater to protect wetland condition.	
D/M5	Create new wetlands where hydrological conditions allow, especially through quarry restoration in the Trent and Idle Valleys (focussing on reedbed, marsh and swamp, reedbed and small, shallow lakes), as well as in the Erewash Valley, and where they provide nature-based solutions to flooding and water quality.	
D/M6	Restore and create ponds and ephemeral wetlands in the wider countryside.	
D/M8	Create new and extensive areas of floodplain grazing marsh (with suitable wetland features) to benefit breeding waders, breeding and wintering wildfowl, invertebrates and plants.	
F/M1	Undertake favourable management of grasslands of higher botanical diversity to maintain and enhance species diversity.	
F/M2	Bring unmanaged and neglected grasslands back into favourable management to increase species diversity, including field margins, buffer strips along watercourses, road verges, railways and amenity grasslands.	
F/M4	Use an appropriate mix of grazing animals for long term management, paying particular attention to stocking densities and the current habitat condition to ensure optimal management.	
F/M5	Undertake creation of new and locally distinctive species-rich neutral grassland in locations with suitable geology, including on low value arable land (where appropriate).	
H/M12	Plant new small-scale woodlands in appropriate locations.	

H - Urban and Post-industrial Priorities and Potential Measures	
Priority Habitats covered:	Open mosaic habitats on previously developed land (post-industrial habitat)
Other habitats covered:	Urban green and blue spaces (including gardens), buildings
Related habitats:	Woodland, watercourse, wetland, heathland and grassland habitats where these occur in urban areas
Geography:	Built-up areas across the LNRS area, and at discrete locations in both urban and rural settings (open mosaic habitat)
Other benefits provided:	Cleaner water, cleaner air, climate regulation, flood mitigation, recreation, economy, education

Code	Priorities
H/P1	Improved condition of post-industrial/brownfield land qualifying as Open Mosaic Habitat on Previously Developed Land to enhance biodiversity and increase resilience to climate change.
H/P2	Increased biodiversity in urban environments (including in new developments), by expanding and enhancing urban green and blue spaces, particularly in areas where this will provide other benefits and nature-based solutions and will help to meet Green Infrastructure Standards.
H/P3	Increased urban tree and canopy cover provide to address tree inequity and help adapt to climate change.
H/P4	Improved conservation status of **Open Mosaic Habitat on Previously Developed Land species assemblage.**
H/P5	Improved conservation status of **Urban species assemblage.**
H/P6	Improved conservation status of **Urban greenspace species assemblage.**

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
H/M1	Undertake habitat management to maintain the features for which a site is identified as OMH, including by undertaking periodic disturbance of patches of substrate to 'reset' succession, and to maintain a good balance of skeletal soils, established grassland, scrub and small wetland areas.	
H/M2	Carry out wildlife-friendly management of public green spaces (including parks, allotments, churchyards and cemeteries, road verges, walkways, watercourses, wetlands and woodlands), including by relaxing mowing regimes, establishing wildflower grasslands, planting native trees and shrubs, and creating ponds.	
H/M3	Reduce/eliminate where possible use of herbicides for weed control in the public realm, using alternative approaches where needed.	
H/M4	Install and retrofit green/brown roofs and living walls in new developments wherever possible, especially on commercial and industrial development and street furniture such as bus stops.	
H/M5	Install and retrofit integrated bat and bird (Swift, House Sparrow, Starling) boxes in all new development (especially residential/public), wherever possible.	
H/M6	Install and retrofit 'Hedgehog Highways' in the garden fencing of new residential development hedgehog-friendly fencing, wherever possible.	

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
H/M7	Plant native and wildlife-friendly trees and shrubs (providing nectar, pollen, berries) in the gardens and landscaping areas in new developments, to provide nectar, pollen and berries for a range of pollinators and birds.	
H/M8	Install SuDS systems which wherever possible are multifunctional and subject to appropriate maintenance regimes, providing habitat as well as surface water management, including retention basins, bioswales and rain gardens.	
H/M9	Deculvert watercourses where opportunities allow, including as part of redevelopment, and give the daylighted watercourses more space.	
H/M10	Install artificial lighting, where required, which is wildlife friendly and designed to best practice.	
H/M11	Plant new trees and retrofit 'missing' trees (i.e. empty tree pits) into existing streetscapes and green spaces following well-designed schemes using suitable species, including fruit trees where appropriate, to address tree inequity (as measured against Woodland Trust's Tree Equity Score the to help meet Green Infrastructure Standards), ensuring proper establishment to minimise failures.	
H/M12	Plant new small-scale woodlands in appropriate locations.	
H/M13	Replace paved surfaces (e.g. concrete, tarmac, artificial grass) where possible with vegetation to provide more habitat and allow water infiltration.	
B/M1	Bring more woodlands and other woody habitats into positive management across the strategy area, following the UK Forestry Standard.	
B/M4	Plant and allow natural establishment of woodlands and other woody habitats at appropriate locations using the UK Forestry Standard to guide design, focussing on the woodland landscapes of the Greenwood Community Forest area, Sherwood Forest and the Mercia Mudwoods, ensuring the right tree in the right place, for the right reason, and maximising other benefits including in relation to water management.	
B/M6	Establish new areas of wood pasture and parkland at appropriate locations, including through the restoration of former areas of this habitat.	
B/M8	Establish woodland ground flora in newly planted woodlands through seeding where appropriate, including at later stages of woodland establishment when soil nutrient levels have reduced.	
B/M9	Bring Ancient and Veteran Trees into favourable management including through use of specialist management techniques, and where appropriate apply veteranisation techniques to develop successor trees to ensure a continuity of habitat.	
C/M1	Use nature-based solutions (such as reedbeds and SuDS) to reduce impacts of sewage discharges on river water quality whilst also creating habitat.	
C/M2	Work to implement natural flood management measures which work with natural processes to reduce flood risk whilst also improving biodiversity through habitat creation and water quality improvements.	
C/M4	Undertake sensitive land management adjacent to watercourses and within their wider catchments that reduces nutrient inputs, surface run-off and soil erosion, including through the creation of 20m buffer strips along watercourses.	
C/M5	Remove or modify artificial barriers to fish passage, such as weirs, or bypass these using fish passes.	

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
C/M7	Undertake favourable management of the riparian zone, including by minimising the impacts of mechanical vegetation clearance and establishing marginal vegetation where absent, where appropriate.	
C/M9	Renaturalise watercourses where appropriate, including by de-channelising, removing redundant hard engineering, reinstating meanders and braiding (if feasible), and creating backwaters and allowing existing natural processes to continue.	
C/M10	Where appropriate and as opportunities arise, reconnect watercourses with their floodplain by e.g. lowering or removing berms and banks, especially where this has flood management benefits.	
C/M11	Manage canals to ensure they retain water where in danger of drying out.	
D/M1	Undertake improved management of wetlands, including through the management of water levels and vegetation.	
D/M5	Create new wetlands where hydrological conditions allow, especially through quarry restoration in the Trent and Idle Valleys (focussing on reedbed, marsh and swamp, reedbed and small, shallow lakes), as well as in the Erewash Valley, and where they provide nature-based solutions to flooding and water quality.	
D/M6	Restore and create ponds and ephemeral wetlands in the wider countryside.	
D/M7	Deliver sensitive management and enhancement of lakes (including those created as part of quarry restorations) to increase their biodiversity value, and where possible.	
E/M1	Undertake rotational management of heathlands and acid grasslands to control bracken and provide a mosaic of habitat including open areas, bare ground, scrub and trees.	
E/M4	Undertake creation of new heathland and acid grassland in Sherwood and on the windblown sands in north-east Nottinghamshire, including as part of quarry restoration and on low value arable land (where appropriate).	
F/M1	Undertake favourable management of grasslands of higher botanical diversity to maintain and enhance species diversity.	
F/M2	Bring unmanaged and neglected grasslands back into favourable management to increase species diversity, including field margins, buffer strips along watercourses, road verges, railways and amenity grasslands.	
F/M3	Increase the value of grasslands in public open space, and in other areas such as golf courses and cemeteries, including by relaxing mowing regimes and increasing species richness.	
F/M5	Undertake creation of new and locally distinctive species-rich neutral grassland in locations with suitable geology, including on low value arable land (where appropriate).	
F/M6	Undertake creation of new calcareous grassland on the magnesian limestone and gypsum substrate, especially as part of quarry restoration.	
F/M8	Retain areas of rough grassland, scrub and habitat mosaics, recognising the value of these for a range of species.	
G/M8	Bring traditional orchards back into management and create new traditional orchards.	

SP - Species Priorities and Potential Measures	
Priority Habitats covered:	Various
Other habitats covered:	Various
Related habitats:	Across the LNRS area
Geography:	Cleaner water; climate regulation; flood mitigation; economic benefits; educational opportunities
Other benefits provided:	Cleaner water, cleaner air, healthier soils, climate regulation, flood mitigation, economy, education

Code	Priorities
SP/P1	Reintroduce **Adder** in Sherwood Forest area
SP/P2	Establish a permanent breeding population of **Bittern**
SP/P3	Safeguard primary breeding site of **Black-necked Grebe**
SP/P4	Reintroduce **Silver-studded Blue** at Clumber Park
SP/P5	Safeguard secure populations of **White-clawed Crayfish**
SP/P6	Expand distribution of **Spined Loach**
SP/P7	Reintroduce **Beaver** in suitable catchments
SP/P8	Expand distribution of **Hazel Dormouse** in north Nottinghamshire
SP/P9	Expand distribution of **Large Red-belted Clearwing** in Sherwood
SP/P10	Safeguard only known UK site of **Diamond-backed Spider** at Clumber Park
SP/P11	Expand distribution of **Deptford Pink**
SP/P12	Expand distribution of **Autumn Crocus**
SP/P13	Expand distribution of **Creeping Willow**
SP/P14	Expand distribution of Black Poplar
SP/P15	Safeguard populations of **Water Vole** and expand their distribution

Code	Potential Measures (see also Overarching Potential Measures)	Nature-based solution
SP/M1	Undertake reintroduction of Adders in line with IUCN guidelines having identified suitable location(s) based on the extensive research undertaken to date and the well-evidenced need for captive breeding.	
SP/M2	Undertake creation of reedbed in habitat patches of a sufficient scale to support the establishment of a permanent breeding population of Bitterns in the Trent and Idle Valleys	
SP/M3	Undertake targeted conservation of Black-necked Grebe at primary breeding site to safeguard population, including through removal of introduced fish stocks.	
SP/M4	Undertake reintroduction of Silver-studded Blue in line with IUCN guidelines at Clumber Park, having optimised habitat.	
SP/M5	Safeguard long-term future of White-clawed Crayfish in Nottinghamshire by establishing Ark sites, and continuing to work to limit the spread of Signal Crayfish in key catchments.	
SP/M6	Implement favourable management of watercourses used by Spined Loach, maintaining dense patches of macrophytes interspersed with open sediment, prioritising the Trent, Idle, Devon and Erewash.	
SP/M7	Establish non-enclosure populations of Beavers at suitable riverine locations in line with IUCN guidelines, working closely with landowners/ managers and local communities, using the best available evidence and following all licencing protocols and guidance on consultation.	
SP/M8	Continue work to establish a self-sustaining population of Dormouse in north Nottinghamshire, including by targeted enhancement of woodlands and improving ecological connectivity between woodlands.	
SP/M9	Manage suitable birch trees to benefit Large Red-belted Clearwing coppicing/pollarding and singling of multi-stemmed trees on a 2-year cycle in and around the three known population centres.	
SP/M10	Targeted intervention to secure existing population of Diamond-backed Spider at Clumber Park (only known UK site), and where feasible, seek to establish larger meta-population at the site.	
SP/M11	Establish new population(s) of Deptford Pink at additional sites in line with IUCN guidelines, using seed from the sole extant Nottinghamshire population.	
SP/M12	Propagate and plant Autumn Crocus at suitable locations, particularly in Greater Nottingham and ensure sensitive management of new and existing sites.	
SP/M13	Propagate and plant Creeping Willow at suitable locations, particularly in Sherwood Forest.	
SP/M14	Establish sources of native Black Poplar at local tree nurseries for planting out across the county at appropriate locations, using stock of known genetics and provenance.	
SP/M15	Implement favourable management of watercourses and wetlands supporting or with the potential to support Water Voles, in combination with the control of non-native predators and targeted reintroduction.	

Table 3 – Supporting Actions

These are actions considered to be out of scope of the LNRS, but are nevertheless important for the protection, enhancement and recovery of nature in the LNRS area.

Pressure - habitats	Description
Designated sites and priority habitats	• Protection of existing designated sites and areas of priority habitat. • Improved condition of SSSIs and LWSs in the LNRS area. • Increased extent of the LNRS area that is 'protected' to help meet national 30x30 targets. • Relevant agencies to designate additional SSSIs and LNRs.
Water	• Rapid reduction (and ultimately elimination) of the discharge of untreated sewage into rivers and watercourses. • Reduced abstraction from rivers and aquifers where this impacts detrimentally on ecological condition of watercourses and wetlands. • Changes to abstraction system to allow 'abstraction at high flows' and upstream water storage. • Changes in policy and regulation (permitting/licencing) to better enable river restoration, including floodplain reconnection and channel braiding.
Woodland	• Enable natural woodland regeneration at scale through changes to policy, funding and public perception. • Promotion of traditional and new markets for wood produce to support sustainable woodland management e.g. charcoal, hedge binders, clothing.
Heathland	• Support the development of the necessary infrastructure for heathland management, particularly grazing. • Establish cost effective ways to manage heathlands, particularly Bracken management (which will be exacerbated by climate change).
Open Mosaic Habitat	• Financial support for the management of OMH, which are high-cost spaces for public and NGO land managers. • Promote opportunities to develop habitat banks for BNG incorporating existing OMH. • Improve awareness of importance of OMH amongst decision makers and owners.
Farming	• Ensure that financial support for farmers encourages habitat creation at scale and also enables diversification. • Develop demonstration sites to share best practice.
Land use planning	• Appropriate planning policy in place to make planning decisions that minimise impacts on habitats and species, provide appropriate mitigation and compensation, and which maximise the biodiversity value of new developments. • Ensure Design Codes for planning integrate nature.
Funding	• Ensure sufficient funding is in place to deliver a step-change increase in levels of habitat creation and restoration, including from government.

Pressure - habitats	Description
Surveys and data	• Improve mapping for all priority habitats • Map current provision of green and brown roofs • Research to identify distribution of Waxcap grasslands to inform their management • Identify local donor sites for seed banks, to allow more creativity on new grassland and reflect sense of place, instead of uniform neutral grassland • Promotion of ATI as a citizen science project to improve baseline information on Ancient and Veteran Trees. • Use of technology to monitor and manage the health of woodlands
Education, engagement and training	• Improved education about the natural environment at schools including through e.g. a natural history GCSE, Forest Schools. • Public engagement and education, including around benefits of unmown grassland, nature-based solutions, health benefits of access to nature. • Education of people about the impacts of recreational disturbance and pets. • Encouraging nature-friendly gardening e.g. by signposting to guidance. • Improved guidance for homeowners doing renovations affecting nesting birds, bats. • Appropriate land management advice to be given to farmer and land managers (consistency over agencies). • Promotion of citizen science projects. • Secure the future of countryside skills in the LNRS area (hedge laying - local styles).
Access to nature	• Provide more access to nature, prioritised at a local level, particularly in urban areas of high health inequality and low access to nature.

6. Mapping of Measures and the Local Habitat Map

The second element of the LNRS, which sits alongside this written Statement of Biodiversity Priorities, is the Local Habitat Map. As well as mapping Areas of Particular Importance for Biodiversity ('APIBs'), the Local Habitat Map shows Mapped Measures and Areas that Could Become of Particular Importance for Biodiversity ('ACBs'). The Local Habitat Map is available to view online at Local Habitat Map (nottinghamshire.gov.uk).

6.1 Areas of Particular Importance for Biodiversity

Areas of Particular Importance for Biodiversity (APIBs) are those areas and designations meeting the criteria set out in the LNRS statutory guidance, covering:

- National conservation sites: Special Areas of Conservation (SAC), National Nature Reserves (NNR) and Sites of Special Scientific Interest (SSSI)
- Local Nature Reserves (LNR)
- Local Wildlife Sites (LWS)
- Areas of 'irreplaceable habitat': those found in the LNRS area are Ancient and Veteran Trees, Ancient Woodland and Lowland Fen

In addition, the Sherwood Forest Key Biodiversity Area (KBA) has been included as an APIB; KBAs are sites that contribute to the global persistence of biodiversity and are the most important places in the world for species and habitats. Sherwood Forest KBA is identified as a 'legacy' KBA by Birdlife International, meeting Important Bird and Biodiversity Area (IBA) criteria.

6.2 Mapped Measures and Areas that Could Become of Particular Importance for Biodiversity

Mapping areas which Responsible Authorities believe '**could become of particular importance for biodiversity'**, or '**where the recovery or enhancement of biodiversity could make a particular contribution to other environmental benefits'** is described in the LNRS statutory guidance as the most important stage in the production of the LNRS, and ACBs should be identified based on their suitability for carrying out the Potential Measures identified in section 5.

To this end, the Local Habitat Map shows two mapping layers in addition to the APIBs – **Mapped Measures**, and Areas that Could Become of Particular Importance for Biodiversity – **ACBs.** The Mapped Measures relate to those Potential Measures where specific areas have been identified for the creation or enhancement of habitat which is most likely to deliver the greatest benefit for nature recovery, and the wider environment. The ACBs are derived directly from the areas mapped as the Mapped Measures but omit those areas that are already identified as APIBs.

The Mapped Measures were developed in consultation with a range of stakeholders, and further information about the process that was followed can be found in **Appendix 6**, however, the following principles were adhered to:

- Mapped Measures (and ACBs) build on the distribution of existing habitats and APIBs, following the Lawton principles of Bigger, Better, More and Joined-up.
- Mapping is ambitious but realistic, and the delivery of activity within the mapped areas is considered to both impactful and feasible within a timescale of 5-10 years.
- The mapping represents a prioritisation process, drawing on existing strategies and priorities, and does not seek to capture all existing or planned nature recovery activity.
- The mapped areas are considered to be the best and most important places to recover nature – but they do not represent everything that needs to happen.
- Mapping has sought to target areas near population centres to improve public access to nature, including in the Green Belt.
- Activity in the mapped areas will deliver other benefits and nature-based solutions.
- Areas identified are a mixture of detailed, field-level mapping and more general area-based mapping (see also below under section 6.4).

It should additionally be noted that:

- Some of the Mapped Measures cover places which are already identified as APIBs, primarily where the enhancement of existing habitats is proposed – these areas are not taken forward as ACBs.
- Many of the Potential Measures identified in Section 5 are 'unmappable' – that is, it is not possible or necessary to identify a specific location to map, because they are similarly beneficial over a wide area, wouldn't have sufficient impact, or a suitable location for a Potential Measure could not be found.
- The presence of 'white space' on the Local Habitat Map should not interpreted to mean that nature recovery activity cannot or should not take place in these areas, as one or more of the unmappable measures may apply.
- Finally, the inclusion of an area in the mapping **does not force landowners, local authorities, or other agencies to deliver the works identified in the LNRS, and nor does it prevent other legitimate land uses from taking place**. Ultimately, the LNRS aims to drive the delivery of local and national objectives for nature and the wider environment, and the mapping helps to inform decisions made by landowners and land managers about how land is used.

6.3 Addressing feasibility and constraints at the habitat project stage

The strategic nature of the LNRS mapping means that mapping has been developed without detailed site-based surveys or assessments having been carried out on each proposed area for nature recovery. Therefore, before embarking on a habitat creation or enhancement project in an area that is mapped in the LNRS, it is essential that the desirability and feasibility of the project is assessed (including by obtaining relevant expert advice) and that potential constraints (e.g. in relation to ecology and the historic environment) are considered.

- Regarding ecology, some areas of existing ecological value will have been mapped for the delivery of a Potential Measure that may not be compatible with that existing interest – for example, woodland creation on an area of good semi-improved grassland. Alternatively, the existing ecological value of an area may be low, but site-specific conditions such as pH, soil nutrient levels or hydrological conditions may preclude the habitat creation work that is proposed.
- In relation to the historic environment, some habitat creation projects may be detrimental to the historic significance of sites covered by the mapped areas, such as the creation of wetlands where there is archaeology present. Depending on the historic environment asset that is potentially affected, consultation with the Historic Environment Record[1], Gardens Trust[2], Historic England[3] and the Local Planning Authority may be required.
- Other potential constraints, such as the presence of buried or overhead utilities, airport safeguarding zones, the need for planning permission for some projects and the presence of land covenants must also be considered.
- The mapping of an area in the LNRS does not negate or over-ride existing protections or designations (in law or policy) and all necessary permissions and approvals must be obtained before embarking on a project.

41 Sherwood Forest KBA (keybiodiversityareas.org)

6.4 Using the Local Habitat Map

Mapped Measures

These are areas where the delivery of a Potential Measure (or Measures) has been mapped at particular location. The Mapped Measures are made up of a number of different mapping approaches:

- **Site specific locations** – locations generally mapped to individual field parcels, where the need for a nature recovery activity has been pinpointed.
- **Landscape areas** – wider areas where a Potential Measure or Measures can be delivered, but it has not been possible, or necessary to identify individual field parcels. In these landscape areas, it is not proposed that the whole area would be subject to a particular Potential Measures but it provides an area within which delivery of that Potential Measure should be focused; so for example, if a landscape area is identified for woodland creation, it is not proposed that the whole area would become a large new woodland, but rather that areas within the landscape area would become woodland.
- **Buffers** – national datasets were used that put buffers around particular watercourses and woodlands to target nature recovery activities.

An effect of using landscape areas and buffers is that they may cover areas where the Potential Measure is clearly not feasible, and whilst efforts were made to remove obviously incompatible or conflicting areas from these buffers, there continue to be cases where they wash roads, residential areas and other areas of incompatible habitats such as lakes. A commonsense approach should be adopted when interpreting these mapped areas.

Mapping has been undertaken in such a way that conflicts between different Potential Measures have been avoided as far as possible. However, some locations are covered by multiple different Mapped Measures (which can relate to the same, or sometimes different habitats), and there can also be overlaps between different Mapped Measures – although these have been reduced as far as possible. No attempt has been made to prioritise one Mapped Measure over another, and decisions about which is most appropriate should be considered on a case-by-case basis, with expert input where necessary, recognising that a mixture of habitats in a mosaic may be desirable.

Additionally, the nature of the mapping is such that Mapped Measures may have been placed over areas of existing ecological value, even though the proposed action would be incompatible – for example, woodland creation on an area of moderately-diverse grassland. Again, it is essential that the desirability and feasibility of a project is examined before embarking on a project. Similarly, where a Mapped Measures is located over an area of built development such as a road, railway, housing or other buildings, it is not intended that these would be removed to make way for new habitat, so a commonsense interpretation is required.

When clicking on an area identified as a Mapped Measures, this will bring up a dialogue box containing:

- Map ID
- Measure code
- Link to measure (taking users to the relevant page in Statement of Biodiversity Priorities)
- Additional information (relating to known heritage assets)
- A warning (about potential constraints)
- A note (stating that inclusion in the map does not obligate a landowners to do anything, or prevent anything else from happening)

Areas that Could Become of Particular Importance for Biodiversity

The ACB mapping is a combined layer which shows all areas identified as Mapped Measures, minus those areas already identified as APIBs. To find out which measures apply, reference should be made to the Mapped Measures layer.

[1] Historic Environment Record (HER) (nottinghamshire.gov.uk)
[2] Nottinghamshire Gardens Trust (nottsgt.org)
[3] Historic England (historicengland.org.uk)

7. Glossary

Agri-environment schemes - voluntary agreements funded by the government that pay farmers to manage their land in an environmentally-friendly way, helping to protect nature and improve soil and water quality.

Agroforestry - a land management system that combines trees and shrubs with crops and livestock, enhancing productivity, sustainability, and biodiversity by integrating agriculture and forestry.

Ancient and veteran trees - ancient trees are of great age and size (dependent upon the tree species concerned) and of high biodiversity, cultural and heritage value; veteran trees may not be very old, but support features such as cavities which contribute to high biodiversity value.

Ancient Woodland – woodland that has persisted since 1600, divided onto ancient semi-natural woodlands (ASNW) comprising trees and shrubs native to the site and usually arising from natural regeneration, and plantations on ancient woodland sites (PAWS) which are sites replanted with conifer of broadleaved trees.

Areas of Particular Importance for Biodiversity (APIBs) - the most important wildlife habitats, as shown on the Local Habitat Map, including national conservation sites, Local Nature Reserves, Local Wildlife Sites and areas of 'irreplaceable habitat'.

Areas that Could Become of Particular Importance for Biodiversity (ACBs) - areas where the Responsible Authority and local partners propose that effort should be concentrated to create and restore habitat, to achieve the most for biodiversity and the wider environment.

Biodiversity - the variety of all life on Earth, including animals, plants, fungi and micro-organisms like bacteria, and which together provide us with everything necessary for our survival including fresh water, clean air, food and medicines.

Biodiversity Net Gain (BNG) - a new and mandatory approach to development which aims to leave habitats in a measurably better state (through enhancement and creation) than they were in before a development took place.

Carbon credits/ carbon offsets - carbon credits, also known as carbon offsets, are permits which allow the owner to emit a certain amount of carbon dioxide (or other greenhouse gases, with credits arising from projects that reduce or remove carbon emissions such as preventing deforestation.

Defra - the Department for Environment, Food and Rural Affairs, the government department responsible for improving and protecting the environment.

Ecological connectivity - the movement of species and the flow of natural processes, including the ability of animals, whether on land or in water, to move freely between different areas, which is essential for the conservation of biodiversity.

Ecological fragmentation - occurs when areas of a habitat are destroyed as a result of human activities, leaving smaller, more isolated areas which support fewer species and have reduced ecological connectivity.

Ecotone – a transitional area between two different habitats, such as grassland and woodland, where there is an area of intermediate habitat sharing characteristics of both habitats (such as a mosaic of grassland, scrub and young trees).

Environmental Land Management (ELM) - ELM is an agri-environment scheme which promotes sustainable farming practices through the Sustainable Farming Initiative (SFI), Countryside Stewardship (CS) and Landscape Recovery strands.

Eutrophic / Eutrophication - eutrophic waterbodies are those with a high level of biological productivity; eutrophication is the process where a waterbody becomes overly enriched with nutrients, with high eutrophication ('fertilising') levels causing excess plant and micro-organism growth and a reduction in oxygen levels.

Green finance - refers to financial investments and services that promote sustainable development and environmental protection by directing funds toward projects that have positive environmental impacts.

Green infrastructure (GI) - a network of natural and green spaces, like parks and wetlands, designed to provide benefits such as clean water, better air quality, recreation areas, and climate protection, especially in urban areas.

Habitats of principal importance - habitats deemed to be a priority for the conservation of nature in the UK, as listed under the Natural Environment and Rural Communities (NERC) Act 2006.

Irreplaceable habitats - ecologically valuable habitats which are very difficult (or take a very long time) to restore or create once they have been destroyed.

Integrated Pest Management (IPM) - a sustainable approach for managing pests, weeds, and diseases on land, which aims to support healthy crops and enhance wildlife using a range of plant protection methods which reduce reliance on chemical pesticides.

Invasive non-native species (INNS) - plants, animals, or other organisms that are brought to a new area where they are not naturally found, often spreading quickly and harming the local environment, economy, or human health.

Key Biodiversity Area (KBA) - the most important places in the world for their species and habitats.

Local Biodiversity Action Plan - a strategy developed to protect and conserve species and habitats of both national and local significance, identifying specific actions and setting targets with the aim of protecting, enhancing and recovering nature within a defined area.

Local Habitat Map - one of the two components of the LNRS (along with the Statement of Biodiversity Priorities), identifying Areas of Particular Importance for Biodiversity (APIBs) and Areas that Could Become of Particular Importance for Biodiversity (ACBs) on a map.

Local Nature Reserve (LNR) - a legally designated site selected by local authorities, which supports wildlife or geological features that are of special interest locally and offer people opportunities to study or learn about nature, or simply to enjoy it.

Local Wildlife Site (LWS) - a local, non-statutory designation identifying sites that are of at least county-level importance for their wildlife, selected based on a set of agreed criteria and used principally in relation to land-use planning and development.

Mesotrophic - a mesotrophic waterbody (such as a lake) has a moderate level of dissolved nutrients, intermediate in status between eutrophic (high nutrient levels) and oligotrophic (low nutrient levels).

Nature Recovery Network - a growing network of wildlife-rich places across England, aimed at moving from site-based protection to active restoration of the natural world, helping to address the three challenges of biodiversity loss, climate change and public health and well-being.

National Character Area (NCA) - geographic areas that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries.

National Nature Reserve (NNR) - legally designated sites of national importance, protecting the best examples of a particular habitat.

Nationally Significant Infrastructure Projects (NSIPs) - large development projects in England or Wales (such as new energy or transport infrastructure) which sit outside the normal local planning process, being approved by government rather than the local planning authority due to their national importance.

Natural Flood Management (NFM) - NFM uses natural methods to reduce flooding, such as restoring rivers, creating wetlands, planting trees, and improving soil to absorb more water.

Nature-based solutions - actions which protect, conserve, restore and sustainably use and manage ecosystems in a way which addresses societal challenges (social, economic, and environmental) whilst benefiting both people's well-being, as well as nature.

Nutrient neutrality / nutrient offsetting - nutrient neutrality aims to ensure that land use or development around a watercourse does not cause an increase in nutrient level inputs to that watercourse; nutrient offsetting allows increased nutrients in one place to be balanced by reductions somewhere else.

Palaeochannels - an ancient river or stream channel that no longer carries water as part of an active river system, normally filled with sediment.

Paludiculture - a system of agriculture for the farming with high water tables, maintaining the profitable use of farmland on peat soils whilst reducing greenhouse gas emissions associated with the drying of peatlands.

Regenerative agriculture - a climate-friendly approach to farming which aims to restore soil health, often damaged by intensive farming practices, to boost crop yields, reduce emissions and increase biodiversity.

Responsible Authorities - a local authority appointed by the government to lead preparation of the LNRS for their area, providing local leadership to consolidate knowledge, data and expertise for strategy preparation with the Supporting Authorities and other partners and stakeholders.

Rewilding - the large-scale restoration of nature, often by reintroducing species of wild animals and allowing natural processes to take place, with the aim of creating wilder, more biodiverse habitats.

Riparian - at the edge of a river or stream; the riparian zone is the interface between a rivers/stream and adjacent areas of land.

Saproxylic - pertaining to dead, dying or decaying wood; saproxylic organisms are those which depends on dead or decaying wood during some part of its life-cycle.

Site of Special Scientific Interest (SSSI) - nationally important, legally protected sites, which represent the finest sites for wildlife and natural features in Britain.

Special Protection Area (SAC) - internationally important sites subject to strict legal protection.

Species of principal importance - species deemed to be a priority for the conservation of nature in the UK, as listed under the Natural Environment and Rural Communities (NERC) Act 2006.

Statement of Biodiversity Priorities - one of the two components of the LNRS (along with the Local Habitat Map), providing a written statement that draws together existing information on the state of nature and the environment in the strategy area, and identifies what the strategy is trying to achieve and the practical actions that could achieve them.

Supporting Authorities - all local authorities covered by the LNRS area plus Natural England and the East Midlands Combined County Authority.

Sustainable Urban Drainage Systems (SuDS) - systems designed to manage and control surface water runoff and pollution risks, particularly in urban areas, through infiltration and attenuation, whilst also habitat and amenity benefits.

Veteranisation - the deliberate infliction of damage to trees that would normally take years to develop naturally, mimicking features found in ancient and veteran trees such as woodpecker holes, broken branches, stripped bark, cavities from fungi, hollowing and lightning strikes, which in turn support specialist invertebrate species.

Wildlife corridors – areas of land that connects areas of habitat which have been separated by human activities, enabling the movement of wildlife between these areas and helping to restore ecological connectivity and reduce ecological fragmentation.

8. List of Appendices

Appendix 1 – Statement of Engagement

Appendix 2 – LNRS Governance

Appendix 3 – Process for developing Priorities and Potential Measures

Appendix 4 – National Environmental Objectives

Appendix 5 – Identifying Priorities and Potential Measures for species recovery

Appendix 6 – Process for the mapping of Measures and ACBs

See separate documents

Nottinghamshire & Nottingham

Local Nature Recovery Strategy

nottinghamshire.gov.uk/naturerecovery

D&P/9178