Norfolk

Local Nature Recovery Strategy

Public Consultation Draft

2025

Norfolk & Suffolk Nature Recovery Partnership

Norfolk County Council

Contents

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There are case studies throught the document that showcase nature recovery in action. These are deonted in the contents in **green** text and with an asterisk (*).

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Words or phrases that may require further explanation are explained in the **Glossary** (p. 300). These are also coloured in **magenta** throughout the document.

References and resources are listed at the end of the document (p.305) and are denoted throughout the text by numbers in square brackets [ ].

When viewed as a PDF, interactive features enable readers to navigate through the document with ease.

Foreword

Norfolk's wildlife is diverse and dynamic, with its mix of coastlines, marshes, forests, and heathlands supporting a wide range of species. From migratory birds to elusive mammals, Norfolk remains a vital haven for wildlife in the UK, offering both residents and visitors the chance to experience the natural world in its raw, beautiful form. Much of our outstanding wildlife is protected but to sustain it into the future we must help our wildlife to grow and expand out from these havens to new places across the county.

As we look to the future, the Norfolk Local Nature Recovery Strategy stands as a beacon of hope and determination, guiding us through the challenges of nature recovery with a vision grounded in optimism and possibility.

This strategy is more than just a plan; it is a reflection of our collective strength, our unwavering belief in the power of collaboration, and our deep-rooted connection to the land, to our wildlife and to each other. It is built upon the idea that recovery is not just about restoring what was lost, but about creating a brighter, more sustainable future for all who call Norfolk home.

As we embark on this journey of recovery, we do so with hope in our hearts and a shared belief that our best days lie ahead. The Norfolk Local Nature Recovery Strategy is our roadmap to that future — one where opportunity, prosperity, and wellbeing are not only restored but enhanced for generations to come.

Wendy Brooks
Head of Environment
Communities and Environment
Norfolk County Council

Co-Chair
Norfolk and Suffolk Nature Recovery Partnership

Introduction

Muckleburgh Hill and Weybourne, with a sunrise over Sheringham.

What is nature recovery?

Nature recovery is the creation and restoration of habitats and biodiversity for example wildlife-rich places, corridors and stepping-stones that help populations to recover, grow, move, thrive and adapt to a changing climate.

We will do this by regenerating wetlands, reintroducing native species, conserving coastal habitats, and creating more green and blue spaces for nature. Sustainable land and coastal management across our county will help to nurture wildlife, improve soil health and produce cleaner water, providing more and better spaces for us to enjoy and connect with nature where we live, work and play, improving our health and wellbeing.

Working with nature helps us to provide the resources required, and nature-based solutions like planting woodlands, restoring rivers and creating wetlands tackle climate impacts while benefiting outdoor recreation through improved water quality and air quality. Cross-sector collaboration that combines local knowledge and science helps revive Norfolk's nature in harmony with its rural economies and cultural heritage.

Managed wetlands at RSPB Strumpshaw Fen showcase nature recovery in action, creating space for wildlife and people within the Broads' green and blue spaces.

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What is a LNRS?

Local Nature Recovery Strategies (LNRSs) are a new approach to restoring and protecting nature in England.

LNRSs are part of a national push to give nature more room to grow. They are a requirement of the Environment Act of 2021 [1, 2]. They focus on highlighting and revitalising natural habitats across Norfolk, including:

- mapping existing important natural areas
- identifying key locations and opportunities for creating or enhancing habitats for maximum environmental benefit
- planning where and how to establish or connect habitats, benefiting both nature and people

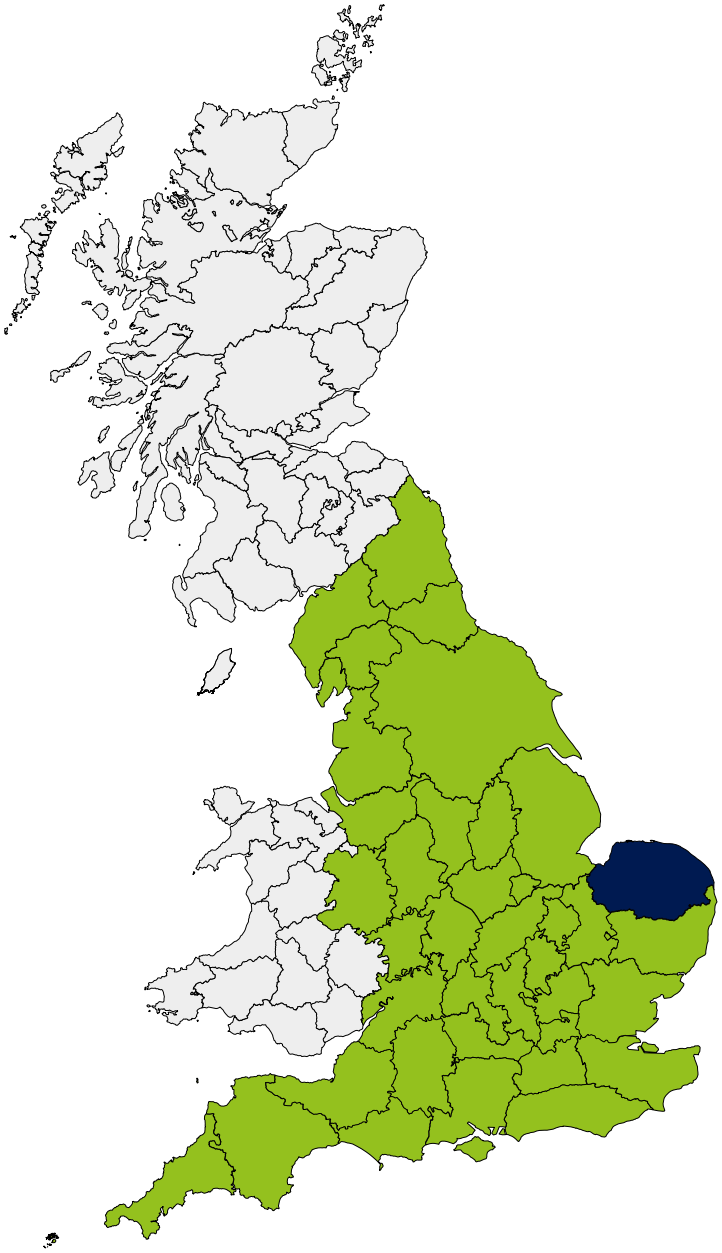
Forty-eight LNRSs developed across England (**Figure 1**) will collectively form a national Nature Recovery Network (NRN).

The LNRS consists of this document, also referred to as the Statement of Biodiversity Priorities and the associated mapping tool, referred to as the Local Habitat Map.

Norfolk's landscape will contribute to this network as it consists of a wide range of habitats, key geographical features and specific areas, shown in **Figure 2**.

The LNRS created will, following statutory guidance, not extend into the marine environment, but it is considered that by improving habitat across the landscape, there will be a related benefit to the marine environment [3].

Figure 1. Forty-eight LNRS Areas in England (green) with Norfolk highlighted (blue).



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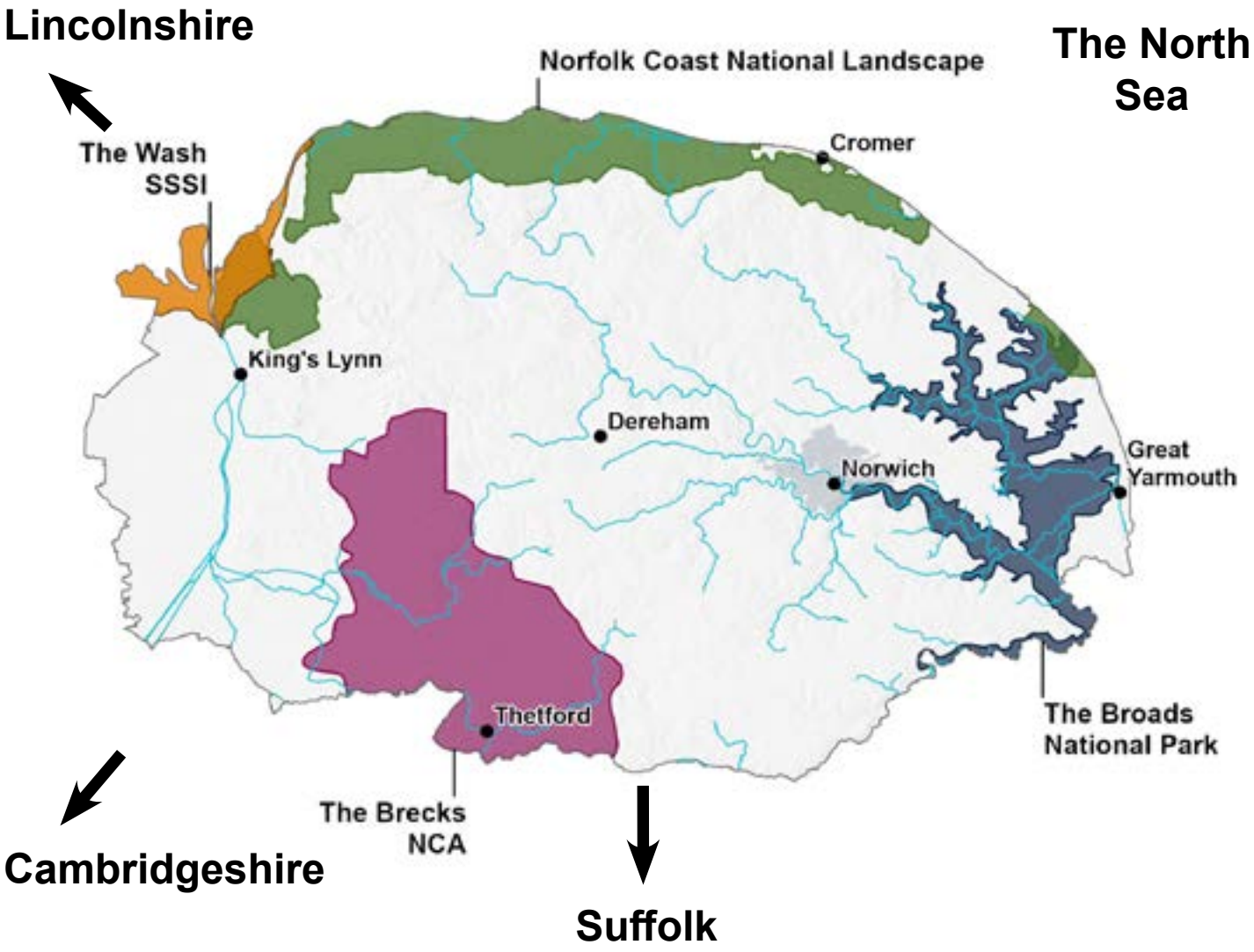
Overview of Norfolk's LNRS area

Figure 2. Map of Norfolk's LNRS area and key landscapes: the Broads, the Brecks National Character Area (NCA), The Wash, the Norfolk Coast National Landscape and major waterways.



These aim to expand, improve, and link natural areas, guiding the implementation of environmental priorities and funding like Biodiversity Net Gain (BNG) [4]. The LNRS will target where habitat creation will be of 'high strategic significance', a 15% uplift in the biodiversity metric (using the strategic significance multiplier)

will be applied if the measures and actions set out in the strategy are followed.

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What should the LNRS be used for?

The contents of the LNRS link into legal duties for delivering environmental factors across the county and the country. These include:

- the duty in the Levelling up and Regeneration Act of 2023 [5] for public bodies to 'seek to further' the purposes of Protected Landscapes (eg conserving and enhancing the natural beauty of National Landscapes and to 'protect and improve the natural beauty, wildlife, and cultural heritage of the area' in National Parks)
- the duty of all planning authorities to 'have regard' to Local Nature Recovery Strategies
- the duty of all public bodies to conserve and enhance biodiversity.

Bumblebee on a flower

What should the LNRS not be used for?

LNRSs are not designed to be prescriptive but are tools to drive forward action to recover nature. They will not be used to:

- require land managers or owners to make specific proposed land use changes – this will remain their choice
- place new restrictions on developing land or act as a specific barrier or blocker for proposals – they will be one source of evidence used to inform the preparation of plans that will determine where development should occur (these plan preparation processes have their own consultation and engagement requirements so that different needs for land can be balanced by the plan maker)
- identify areas to be given legal nature protections that create restrictions on how land can be used or managed – LNRSs do not propose new nature reserves or any other kind of legal designation
- prevent nature conservation work in areas not prioritised by the LNRS (eg by restricting funding in areas that are not mapped)
- determine regulatory decisions, such as the result of Environmental Impact Assessments – they can be a source of evidence to inform decision making but determination must still be made on the basis of relevant legislation and statutory guidance.

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Who created Norfolk's LNRS?

Norfolk County Council has been designated as the responsible authority for developing Norfolk's LNRS. Under the shared banner of the 'Norfolk and Suffolk Nature Recovery Partnership' (visit the NSNRP website at **nsnrp.org** and see **Appendix 5**), the Norfolk LNRS has been delivered by working closely with:

- Norfolk district and borough councils
- Broads Authority
- North Norfolk Coast Protected Landscape (National Landscape)
- nature conservation organisations
- landowners and land managers
- local people, groups and stakeholders
- private companies and local businesses.

Working with neighbouring Suffolk County Council, the Norfolk and Suffolk LNRSs have been developed in a joined-up way to reflect the shared natural habitats and species that sit across both counties. Close working with Cambridgeshire and Lincolnshire has ensured cohesion across shared boundaries.

The Department for Environment, Food and Rural Affairs' (Defra) guidance encouraged involving diverse participants in the LNRS process. Steering and expert groups provided advice, while stakeholders like nature specialists, community groups, landowners and local councils shaped the strategy through targeted engagement.

Six Themed Working Groups (TWG) were established to give as many stakeholders and interest groups as possible the opportunity to help influence and shape the content of the LNRS as well as providing valuable technical input and expertise. These were:

Mapping

Land Management

Species and Biodiversity

Water and Coast

Planning Norfolk

Planning Suffolk

Membership of each TWG included existing partners with whom there were already well-established working relationships as well as wider groups and organisations where new collaborative relationships have been formed.

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Alongside specialist engagement, input and suggestions were sought from the wider public throughout the process of developing the strategy (**Figure 3**). Involving the public alongside professional opinions ensured a wide range of perspectives were included.

To reach all the different groups, engagement was conducted through multiple formats:

Events (11)

- Public event stands
- Talks and panel sessions
- Site visits and networking meetings

Presentations (33)

- Presentations to organisations and businesses
- Invitations to speak at partnerships
- Presentations to stakeholders

Digital engagement

- Social media platforms
- News updates on websites
- Email information distribution

Surveys (2)

- Public opinion surveys
- Surveys for target groups
- Public consultation

Webinars (9)

- Webinars with guest speakers for public and professionals
- Online roundtables

Workshops (37)

- Themed Working Groups
- Focus groups
- Collaboration discussions and data sharing

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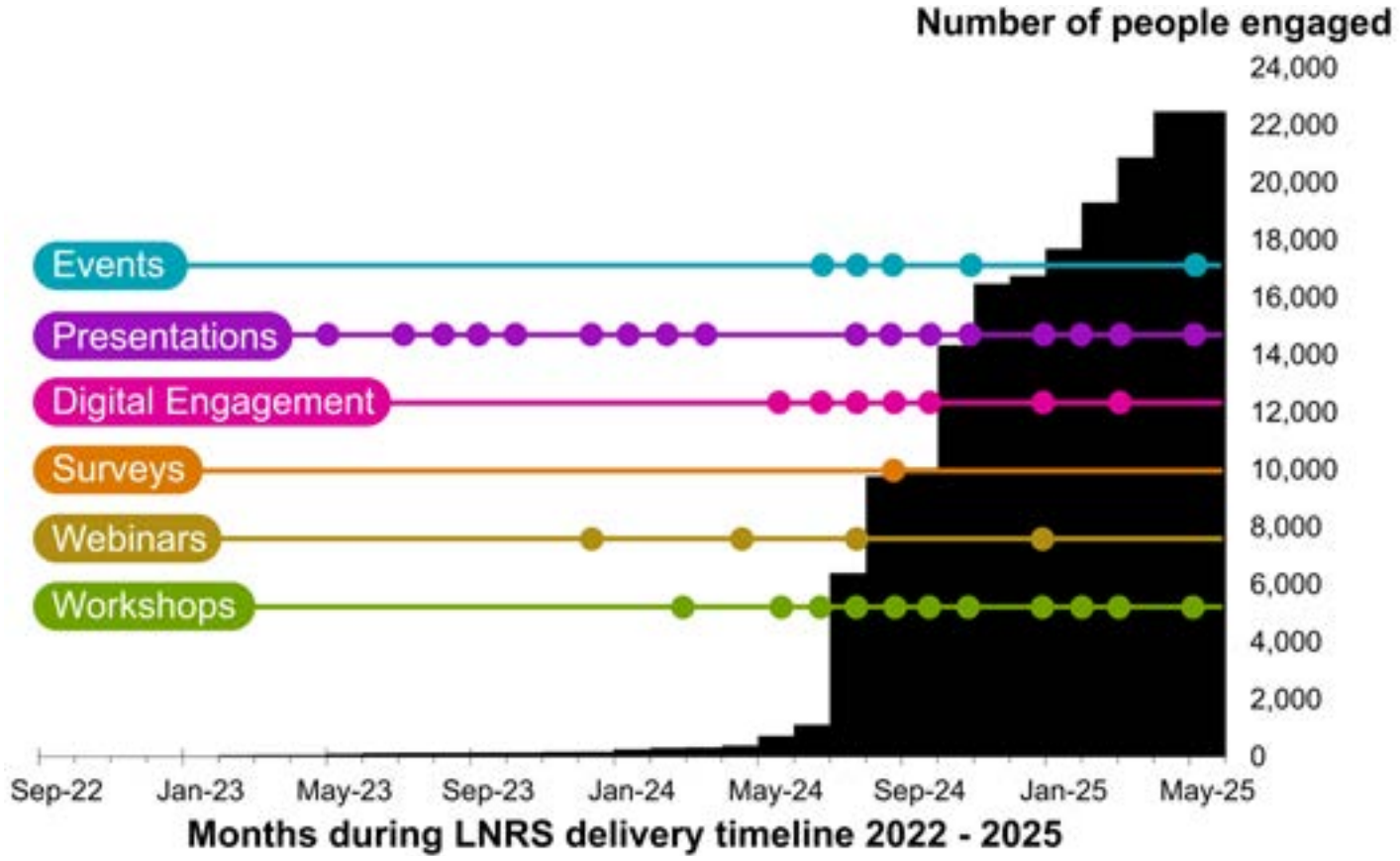
Figure 3. Numbers of people engaged through Norfolk-led and NSNRP efforts during LNRS delivery.



Engagement numbers for Norfolk-led and NSNRP activities during the LNRS delivery. Engagement activities - events (teal), presentations (purple), digital engagement (pink), surveys (orange), webinars (gold), and workshops (green) - are displayed below with timelines indicating their occurrence from September 2022 to May 2025. The grey area represents cumulative engagement, showing the growing reach to over 22,500 people through these activities and stakeholder interactions over the delivery timeline.

In Spring 2024 the public and land managers were asked which species and habitats they thought were the most important to prioritise in the LNRS; 1,590 people responded to the surveys.

It was anticipated that the species and habitats that are important to the public may differ to those that landowners and other stakeholders involved in the process, due to the varied factors involved with experiencing nature and working within the landscape.

To ensure the LNRS represents the full county, all the survey suggestions were included on the longlist for biodiversity priorities and were given the same consideration as those included using a data-based approach or presented by conservation experts (see further information in **Part C**). The full longlist can be found on the NSNRP website: www.nsnrp.org.

Public survey responses flagged pollinators and hedgehogs as key species for residents in Norfolk – you can find them both in our Statement of Biodiversity Priorities (**Part C**).

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Norfolk County Council greatly appreciates the valuable contributions and perspectives provided by all those involved in developing this plan, including:

- individuals who participated in public surveys, events and workshops
- landowners who responded to surveys and joined workshops
- local subject matter experts from the NSNRP and its steering committee
- Natural England, Environment Agency and Forestry Commission.

Landowners, conservation and community experts and organisations have contributed case studies that demonstrate successful nature recovery in practice. These case studies have been included to highlight existing efforts and best practices, and to support the potential implementation of future projects.

Funding to support the creation of Norfolk's LNRS has been provided by Defra.

Guided tours exploring rewilding, regenerative farming and conservation at Wild Ken Hill.

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How can the LNRS support the people of Norfolk?

The strategy outlines a plan for how everyone in Norfolk – individuals, local communities, landowners, local governments, businesses, and national agencies – can come together to restore nature through planning and on-the-ground action.

For everyone in Norfolk, the LNRS will:

- inform how all public authorities in England meet their legal duty to conserve and enhance biodiversity, through land management and regulatory decisions
- seek to enhance the positive effects of nature on community wellbeing that contribute to improved mental and physical health, including direct and indirect benefits like clean air, water and food
- help identify key areas within the local community to prioritise nature recovery efforts while fostering community ownership at various levels, from nest boxes to nature reserves, so everyone can get involved.
- provide potential locations for initiatives aimed at creating and enhancing habitats
- aid in aligning local and neighbourhood plans and other spatial strategies with countywide objectives, and informing priority actions in future plans
- support funding applications for nature recovery projects
- encourage local community groups focused on nature recovery.

For land managers, the LNRS can:

- signpost ways to help enhance and restore nature, providing a strategic spatial guide for habitats and species recovery and supporting environmental funding schemes under Environmental Land Management Scheme (ELMS) such as Countryside Stewardship, Sustainable Farming Incentive and Landscape Recovery schemes, enabling large-scale positive changes for nature
- support sustainable agriculture, flood risk management, water management (both availability and quality) and carbon capture using measures such as planting trees and improving soil health
- identify the highest priority opportunity areas for habitat creation and connectivity, helping to channel BNG investment
- provide guidance on actions to achieve nature recovery – linking efforts across the county for expanding and connecting habitats, including development and implementation of Protected Landscape Management Plans.

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For environmental Non-Governmental Organisations, the LNRS aims to:

- facilitate the connection of long-term goals and generate greater ambition for nature recovery across partnership organisations
- further promote nature and wildlife recovery projects and strategic objectives
- help prioritise areas, potential measures and collaborative efforts for nature recovery, including species monitoring and evidence gathering as appropriate.

For planners and developers, the LNRS can:

- provide information to local planning authorities on the nature recovery priorities in their area and best practices for enhancing biodiversity
- inform green infrastructure delivery for local plans and neighbourhood plans
- support decision making for offsite potential for BNG
- help to inform potential measures for embedding nature into urban and new infrastructure such as stormwater management, contributing to climate resilience and delivering the most suitable nature-based solutions for Norfolk in the right places.

Planners have a legal requirement to 'take account' of the content of the LNRS, to ensure nature recovery is properly reflected in the planning system [6]. The key documentation is available at **www.gov.uk/guidance/natural-environment** but is summarised below:

- Local planning authorities should be aware of mapped areas and proposed measures in the relevant LNRS and consider how these are reflected in their local plan
- The LNRS is an evidence base that may be a 'material consideration' in planning; the decision-maker determines its relevance based on circumstances.

For local businesses, the LNRS:

- signals Norfolk is open for green investment, showing that nature is at the heart of a successful local economy
- unlocks opportunities and provides supporting evidence for businesses and tourism to meet environmental and social goals while driving economic growth
- has the potential to promote and encourage a balanced approach to private and public investment into ecosystem creation and restoration, guiding investment and donation to specific projects.

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Healing through nature: Nature Connect

Nature Connect aims to support adults to develop a closer relationship with nature, for better personal and planetary health through a peer-led, co-created programme of sea-sonal activities. These are delivered in predominantly urban settings across Norwich, and part of Norfolk, where specific needs have been identified: loneliness, social deprivation, long term health conditions and poor mental health outcomes.

Nature Connect aims build strong community bonds between individuals and with other grassroots groups, to ensure the longevity of this work and its transformative effects.

Who's involved?

Norfolk and Waveney Mind is the lead organisation, employing a Nature Connect Project Coordinator to deliver the outcomes and to collaborate with organisations from community groups to conservation orgs, local businesses, charities and private landowners.

Funding has been provided by the Co-op Resilience Fund, Norfolk Community Foundation, Natural England, and Awards for All, as well as Norfolk and Waveney Mind's own fundraising efforts.

What have they achieved?

In 2024, over 200 individuals were engaged in activities in Mile Cross alone, and over 120 people were directly supported to develop their relationship with nature.

96% of participants said that their mood was improved after the session and 100% felt that the session improved their wellbeing. Participants reported the benefits of joy, calm, community, safe space and learning something new. Nine people have been trained as walk leaders and forest bathing peer group leaders to continue the work.

Nature Connect is a key partner in Green Hearts, a grassroots community action group focused on improving the environment in Mile Cross. It aims to foster a community of nature lovers, encouraging actions that protect and nurture the environment, by amplifying and enabling incredible local residents.

The project has created local community spaces to informally connect with each other and nature, giving people more autonomy to keep themselves well. The new green hub and community garden in the heart of the estate on Burgess Road has, thanks to a growing team of volunteers, turned a derelict and overgrown site into a space designed and created by and for local residents. The garden will have accessible pathways, raised beds, shaded seating areas and a well-stocked community toolshed.

Demand for Nature Connect's Forest Bathing sessions is growing alongside requests to join the peer-led groups. The co-designed seasonal workshop programme has been expanded to more locations.

Find out more at www.norfolkandwaveneymind.org.uk/nature-connect

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How do they do it?

The project emphasises that it is 'the moments, not the minutes' in nature that count, towards improved health and wellbeing. The project offers a variety of ways of taking time, at home or outdoors, to engage with the benefits of nature in accessible, simple and meaningful ways.

All projects are started by finding out what already exists: where the local green and blue spaces are, and who the key people, groups and networks are that could advocate for more nature connection. All activities are co-created and are updated to respond to participants' experiences and needs.

What's next?

- Reaching to more community groups across Norfolk. Nature Connect has recently been awarded funding to further explore the complex relationship between nature connection and climate distress
- Further participation with established partners such as Norfolk Wildlife Trust to encourage community rewilding initiatives, nature reserves and wildlife corridors. Ultimately, there is no societal mental health recovery without nature recovery;
- Further develop the project's specialism in Forest bathing and mindfulness in nature practices, including more opportunities to learn peer led group skills to enable more people to practice these skills for themselves.

Left to right: Wassailing event at Bacton Road orchard; a sunflower planted as part of the community gardens at Burgess Road; community managed raised beds at Lefroy Road.

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Why does nature in Norfolk need recovering?

Norfolk's habitats have been shaped by centuries of human interaction with the land and sea. They have been continually managed in ways to provide us with shelter, food, water, fuel, natural materials and recreation. Over time, the majority of our habitats and species have undergone significant dynamic changes shaped by a range of environmental and social factors. Evidence from the last 50 years indicates that nature is in decline and we have experienced a significant loss of biodiversity [7]. Contributing factors include:

- intensive agricultural practices
- increased demand on water and other natural resources
- air and water pollution
- invasive non-native species
- animal and plant diseases
- degradation of peat
- development and new infrastructure
- fragmentation of habitats
- loss of coastal habitats
- climate change
- loss of traditional land management techniques
- reliance on artificial pesticides and herbicides
- changes in the use of natural resources
- increased recreational pressures.

On average, species abundance in England has fallen by about one-third (32%) since 1970 [7]. Among UK species in Norfolk that are classified as critically endangered are:

- European eel
- Northern pool frog
- Starry Breck lichen

Among those on the endangered list in Norfolk are:

- Barberry carpet moth
- Crested cow-wheat
- Common swift

Lots more are 'vulnerable' (threatened with extinction) or 'near threatened' (close to being endangered in the near future) – see **Appendix 2** for further details. As indicated in the State of Nature report from 2023 [7], the UK overall has seen significant habitat impacts, with only 1 in 7 habitats assessed as being important for wildlife reported to be in a good condition.

European Eel
Anguilla anguilla

Northern pool frog
Pelophylax lessonae

Starry Breck lichen
Buellia asterella

Barberry carpet moth
Pareulype berberata

Crested cow-wheat
Melampyrum cristatum

Common Swift
Apus apus

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What nature recovery can do: Wendling Beck

Wendling Beck is a 2,000 acre nature restoration initiative near Dereham. Working collaboratively with landowners and farmers, the project spans four farms and three SSSIs (Site of Special Scientific Interest). The aim is to reverse local biodiversity loss and inspire climate action by creating a sustainable balance between agriculture and nature.

Who's involved?

The Wendling Beck Project was launched during the 2020 COVID-19 lockdown by Glenn Anderson of Dillington Hall Estate, who sought a new direction as agricultural subsidies were phased out. He works with neighbouring landowners Rosie and Alex Begg, Tom Cross, and the Bullard family, in partnerships with Norfolk County Council, Breckland Council, Anglian Water, environmental NGOs, and Natural England.

Neighbouring landowners Glenn Anderson and Rosie Begg in the Wendling Beck project area.

What have they achieved?

Habitat Restoration and Creation

- 65 acres of heathland
- 50 acres of lowland meadow
- 75 acres of other species-rich grassland
- 100 acres of parkland
- 10 acres of lowland fen
- 20 acres of woodland
- 15 acres of scrub
- 2000 metres of hedgerows
- 600 metres of rare chalk stream restoration

There are many more habitats to follow.

Biodiversity Net Gain

Wendling Beck is one of the pilot projects for Natural England's Biodiversity Net Gain initiative, pioneering the new requirement for all new developments to leave the environment in a measurably better state than it was before. The project is estimated to deliver around 2,500 BNG units. They have entered into a long-term Conservation Covenant, with RSK Wilding as their Responsible Body.

Carbon Sequestration

The project is expected to sequester over 250,000 tonnes of carbon, (the equivalent energy use of about 60,000 UK homes) significantly contributing to climate change mitigation efforts. They are collaborating with the University of East Anglia and Treeconomy are helping to track and monitor carbon sequestration in above ground biomass and the soil.

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How do they do it?

Spanning four farms and three SSSIs, WBP aims to reverse local biodiversity loss and inspire climate action through a holistic approach that integrates:

Regenerative Agriculture

The project shows that food production can coexist with thriving ecosystems by using regenerative farming practices and grass-fed livestock to manage species-rich grasslands and high-value habitats.

Environmental Finance

The project is exploring innovative funding mechanisms, including the sale of ecosystem services such as BNG units, nutrient neutrality credits, and natural flood management solutions.

Data-Driven Management

Wendling Beck uses advanced geospatial data modelling and AI-powered analysis to inform decision-making, optimise habitat creation, and monitor progress.

Community Engagement

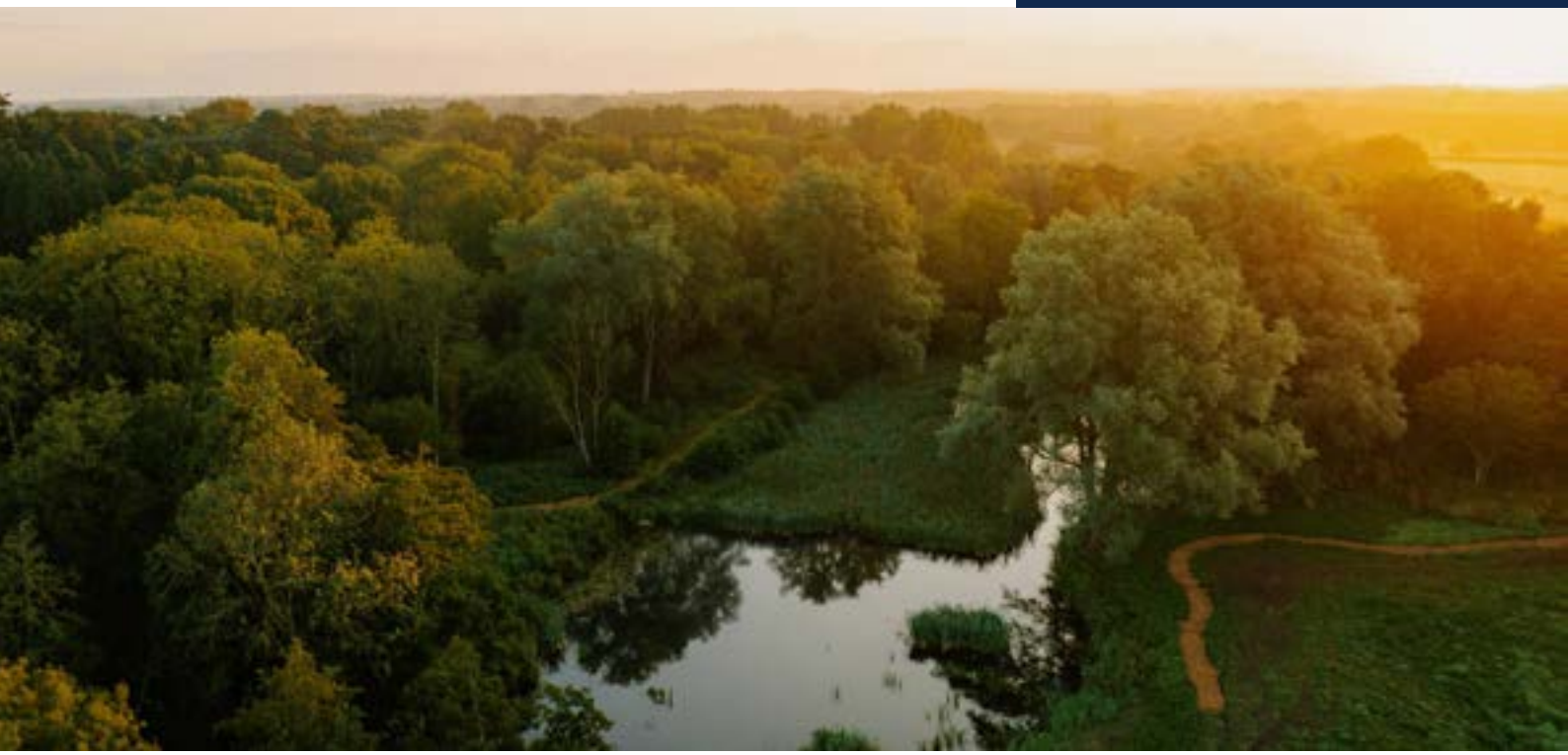
They are working to reconnect people with nature by providing immersive experiences in a wilder landscape. Plans include the development of cycling and walking trails, as well as an environmental education hub at the nearby Gressenhall Museum of Rural Life.

What's next?

The project will continue to create and restore high distinctiveness habitats over the next 2-3 years. Wendling Beck aspires to be an exemplar for monitoring and verification and is pioneering novel species monitoring techniques such as bioacoustics and eDNA.

Recently, the team has launched Wildscapes, an eco-tourism initiative aiming to deepen people's connection with nature and a farm shop and cafe will be opening very soon.

Find out more at www.wendlingbeck.org



The Wendling Beck nature recovery project area in Norfolk.

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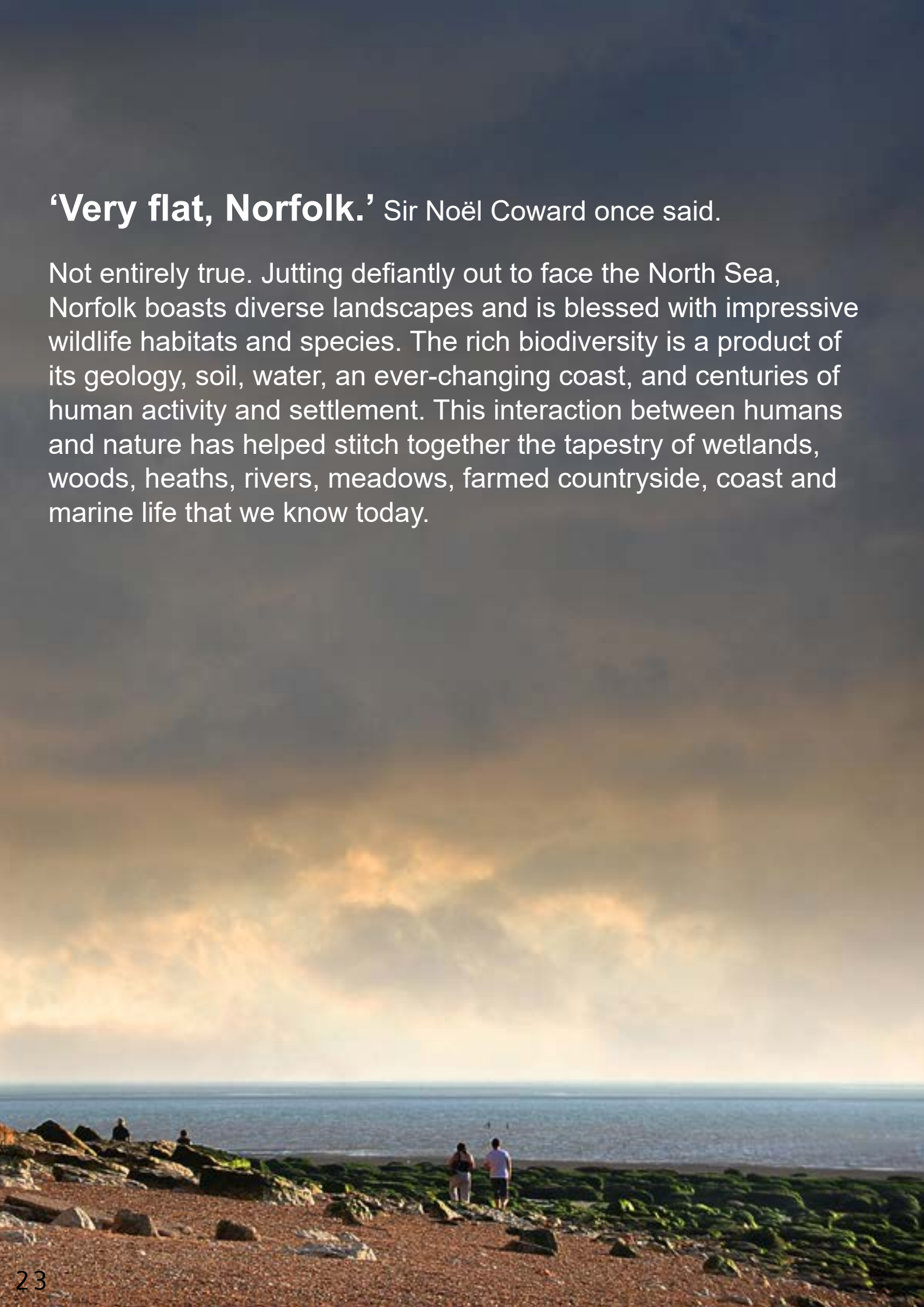
Part A: Strategy Area Description

Hunstanton's striking red and white cliffs are a vibrant ecosystem for diverse species, from nesting seabirds to coastal flora.

‘Very flat, Norfolk.’ Sir Noël Coward once said.

Not entirely true. Jutting defiantly out to face the North Sea, Norfolk boasts diverse landscapes and is blessed with impressive wildlife habitats and species. The rich biodiversity is a product of its geology, soil, water, an ever-changing coast, and centuries of human activity and settlement. This interaction between humans and nature has helped stitch together the tapestry of wetlands, woods, heaths, rivers, meadows, farmed countryside, coast and marine life that we know today.



The geology underlying Norfolk's habitats

Norfolk is characterised by gentle hills and river valleys, large flatlands and wetlands and bounded by the coast. Mostly flat, with the highest point at only 105 metres above sea level, about a third of Norfolk lies below 20 metres. The Rivers Waveney and Little Ouse emerge near the wetland of Redgrave and Lopham Fen, but then flow in opposite directions. The main river catchment of the Wensum flows across the county from near Fakenham in the north west to the Broads in the east. The larger river valleys reveal hidden chalk and rock layers, especially visible in Hunstanton Cliffs' stripes unveiling the varied geology from coast to sandy heath of The Brecks.

Norfolk's underlying geology is mostly chalk, with water stored in layers called aquifers, surfacing as springs to nourish unique wetland habitats, important for providing water for farming, businesses, and homes. The Fens and Broads (**Figure 4**), with their underlying soils of peat, silt, or clay, host diverse wetland environments like lakes, marshes, fen, wet meadows, reed beds, and wet woodland. These areas not only serve as the primary drainage for Norfolk's rivers, creating extensive basins and floodplains that lead to the sea but also are home to a remarkable array of biodiversity.

Figure 4. Map of Norfolk's National Character Areas (NCAs) highlighting distinct regions that reflect unique geographical and ecological characteristics.

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In Norfolk, water and sedimentary rocks like chalk, sand and clay underpin the area's habitats, wildlife, and farming. The county features diverse soil types with ice age debris shaping hills and valleys, dominated by chalk. These geological features, rich in fossils and glacial landforms, offer a nationally significant glimpse into Norfolk's ancient history.

Soils are the second largest carbon sink after the oceans. Peat is an ancient soil, formed several thousands of years ago in bog or fen habitats. It is found in the Broadland area and fens of southwest Norfolk and northwest Suffolk where it can be several metres thick. Peatlands are the largest natural terrestrial carbon store sequestering 0.37 gigatonnes of carbon dioxide (CO_2) a year globally and, according to the International Union for Conservation of Nature (IUCN) [8], store more carbon than all other vegetation types in the world combined.

Norfolk's diverse landscapes host a tapestry of interconnected environments, each adding to the ecological network. This complexity becomes especially apparent in ecotones, the transitional areas where different habitats like woodlands and meadows or rivers and marshes meet. These zones are biodiversity hotspots, offering varied resources, microhabitats and opportunities that support many species.

By focusing on connectivity and the enhancement of habitats, the LNRS will support the resilience and vibrancy of local ecosystems. This approach is vital for supporting wildlife and ensuring community wellbeing, adapting effectively to environmental changes.

At Lakenheath Fen, a sluice is installed to raise water levels and prevent the drying of peat soils, which can release stored carbon

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The historic environment

From flints up to a million years old to underground Cold War bunkers, from Roman villas and forts to medieval castles, moats and churches, Norfolk's historic environment is the evidence of our past and a unique and precious inheritance.

Many sites are designated due to their ecological importance and their inclusion of heritage assets – past human activity, design and land use or management mean that there can be a concentration of protected species and habitats present. This could include a wide range of features such as ancient and veteran trees, defensive or ornamental water bodies or long established woodland and grassland communities [9].

Earthworks of the Iron Age fort, Warham Camp, sitting within Norfolk's agricultural landscape.

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Restoring peatlands: Cowles Drove extension to Lakenheath Fen

Since 1995 the RSPB has created nearly 500 hectares of reedbeds, grazed fenlands and wet grasslands on their nature reserve: Lakenheath Fen. In 2023 work began to expand the reserve by reverting an additional 67 hectares of adjacent arable land to wet-land.

The project aims to create fen and wet and dry grassland on the Norfolk/Suffolk border and to protect the remaining carbon held in the fields' peat-based soils. When the land was being farmed, the peat had oxidised, releasing significant amounts of carbon dioxide.

The land lies within the Fens National Character Area with fen and wet grassland being priority habitats. Lakenheath Fen qualifies as a Site of Special Scientific Interest (SSSI) and as a Special Protection Area (SPA) for Common Crane, Eurasian Bittern and Western Marsh Harrier (but has yet to be designated).

Who's involved?

RSPB is the landowner and project manager of this scheme which has been funded by a donation from the Morgan Sindall Group. The RSPB is also part of the Fens East Peat Partnership (FEPP). The Lakenheath Fen project contributes to a larger effort to restore peatland sites in low-lying areas across Lincolnshire, Cambridgeshire, Norfolk and Suffolk. FEPP received grant aid from the Natural England Nature for Climate Peatland Grant Scheme.

Consultation involved King's Lynn and West Norfolk Council, Southery and District Internal Drainage Board (IDB), Environment Agency, Natural England, neighbouring landowners and the Ministry of Defence.

What have they achieved?

- 67 hectares (ha) of arable land has been restored back to fen and wet and dry grassland
- We have raised the water levels across a wider 118 ha area to prevent peat erosion and carbon release
- New habitat has begun to be used by wading birds, water fowl and egrets.
- Cattle grazing on the land has commenced.

Cattle Egrets started visiting Lakenheath Fen shortly after grazing cattle were introduced.

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Sluice and pipe under drove in construction at Lakenheath Fen.

How they do it

The project started with extensive survey work to measure soil quality, peat depth, protected species and vegetation of the fields and ditches. We made use of existing data on peat depth, water transport through the soil and LiDAR (light detection and ranging) topography.

Water levels were raised by damming internal ditches and installing water control structures (including 7 sluices and 16 culverts) as well as removing field drains to prevent water loss, and the re-routing of an IDB drain.

Badgers and water voles were relocated and new habitat was created for them. Manual dipwells and auto-loggers were installed for ongoing monitoring of water levels and surface level change rods to monitor peat depth.

What is next?

- Installation of additional stock fencing.
- Installation of an electric pump (and its connection to the grid), to maximise the movement of water for our target habitats (fen and wet grassland) and species (waders, egrets, crakes, cranes).
- Finishing the validation process by the IUCN Peatland Code
- Continue ongoing monitoring of the water, species and habitat
- Registering the land (where eligible) for Biodiversity Net Gain
- In the longer term, we will install predator exclusion fencing around one field
- Much of the work to date has been done by contractors or RSPB staff but as the site transitions into more regular maintenance work RSPB will make increasing use of its volunteer team to assist with managing the land.

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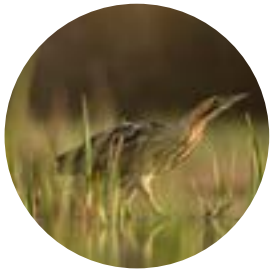
Norfolk's coast

The Norfolk coast, stretching over 90 miles from The Wash to Great Yarmouth, is a prime area for diverse plant and animal life, bordered by the North Sea. Here, habitats like wetlands, saltmarshes, dunes, shingle beaches, and cliffs, essential for rare plants and many bird species act as crucial breeding and wintering grounds. Part of this coastline is designated as the Norfolk Coast National Landscape, highlighting its landscape value. Freshwater and saline habitats attract thousands of waders and wildfowl, with bitterns and marsh harriers inhabiting the reedbeds. This stretch of the coast supports up to 40% of the world's over-wintering population of pink-footed geese and a significant percentage of the planet's brent geese. Their noisy flight between fields and marshes in autumn and winter is a magical sight.

The Wash, with its saltmarshes and intertidal mudflats and rich marine life, stands as one of the most vital embayments for birds in Europe. Together with the broader Norfolk coast, it forms an essential part of the East Atlantic Flyway, a major bird migration route extending from the Arctic to Africa, and are currently under consideration for UNESCO World Heritage status.

Norfolk's saltmarshes and coastal sand dunes are nationally significant, making up 9.6% and 9% of the UK's total for these habitats, respectively. Saltmarshes, areas of land regularly covered by the tide, are a sea of purple in late summer as common sea lavender flowers, and alongside dunes and shingle support colourful and rare plants and animals. The wetter dune slacks and their pools are a home for orchids, and the rare natterjack toad. Additionally, mudflats, saline lagoons, maritime cliffs, and coastal vegetated shingle, are all priority habitats found on Norfolk's coast.

Coastal habitats are naturally dynamic, with the coast constantly responding to waves, tides, and storms, shaping landmarks like Blakeney Point and Winterton Dunes. The slumping cliffs of Trimingham and Overstrand, altered by both water on the ground and by the sea itself, illustrate the coast's ever-changing nature. Managing these changes is crucial for nature recovery, as rising sea levels and shrinking coastal habitats pose challenges.



Bittern
Botaurus stellaris

Marsh harrier
Circus aeruginosus

Brent goose
Branta bernicla

Natterjack toad
Epidalea calamita

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Norfolk’s coastal landscapes have long inspired countless artists and writers, drawn to the unique beauty and tranquility of Norfolk’s environments. Such connections underline the inseparable bond between the land and its people, a relationship that continues to define Norfolk’s identity and conservation ethos.

A flock of pink-footed geese takes flight at Holkham, on Norfolk's north coast.

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Coastal pressures

The Norfolk coast faces significant pressures from climate change and human activity, threatening its unique habitats and globally important biodiversity. With average temperatures set to rise by up to 1.6°C in summer and 1.3°C in winter by the 2040s, climate change is driving significant impacts. Rising sea levels, projected to increase by 0.2–0.4 m by mid-century and potentially exceeding 1 m by 2100, directly threaten habitats like saltmarshes and mudflats [10].

The region's water systems are under strain. Norfolk and Suffolk, among England's driest counties, face projections of up to a 13% summer rainfall reduction and a 5 – 8% winter rainfall increase by the 2040s [10, 11]. These shifts, coupled with higher temperatures, could reduce freshwater flows, increase groundwater abstraction, and cause saline intrusion into marshes and estuaries, degrading habitats. A summary of key pressures identified by regional experts is as follows:

- sea level rise due to climate change and 'post-glacial' rebound
- sea defence structures and artificial stabilisation measures change sediment deposition and affect the dynamic nature of all coastal habitat systems
- large-scale built development and infrastructure is a risk to these habitats, however when designed well, impacts can be properly mitigated and compensated
- excessive recreational pressures from visitors will cause damage and disturbance to sensitive habitats and species
- climate change impacts include higher temperatures and prolonged periods of drought which may result in ground water abstractions increasing and freshwater river flows reducing. Estuaries may become increasingly saline, negatively affecting the intertidal habitats. Increased groundwater abstraction may also lead to saline intrusion of the coastal marshes. Conversely, wetter winters can lead to increased flooding and impacts on surrounding habitats due to waterlogged soil
- habitat loss caused by artificial coastal defences also leads to 'coastal squeeze' which results in habitat loss, including of vegetated shingle and saltmarsh
- poor agricultural practice can lead to air and water pollution which negatively impacts on coastal habitats and species
- unsustainable fisheries management can lead to a reduction in prey species for some of our important fish-eating birds.

Despite these challenges, Norfolk's coastal landscapes also offer opportunities for restoration and adaptation to enhance biodiversity and resilience. These are explored further in **Part B: Opportunities Identified**.

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For further details on coastal pressures, visit The Natural Capital Evidence Compendium for Norfolk and Suffolk at www.nsnrp.org/publications or scan the QR code.

Sea defences on Norfolk's coastline reduce erosion but can disrupt coastal biodiversity and habitats.

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Landscape recovery: Wilder, wetter and better for nature

In North Norfolk, a transformative, landscape-scale project is being planned to create entirely new wildlife habitat from current arable land.

It will fill in the habitat gaps, north of the A149 between Hunstanton and Weybourne, to give a contiguous area of habitat of approximately 23,000ha. It will also create and enhance terrestrial corridors along five chalk rivers. In total, 5,096 ha of new habitat will be created.

This will improve species migration and colonisation opportunities, enhance biodiversity, improve water quality, increase climate change resilience and connect visitors and local communities to the natural world around them.

Who's involved?

They are supported by a cross-sector public-private partnership consisting of the grant recipient Norfolk Coast Partnership (hosted by Norfolk County Council), Norfolk Rivers Trust (NRT) and Holkham Estate.

Also supporting are Natural England, Environment Agency and the Forestry Commission as well as local wildlife groups and organisations.

More broadly the project works closely with the UEA (who produced the North Norfolk Biodiversity Audit which underpins this work).

The development phase of this project is funded by Defra until June 2025.

Find out more at www.norfolkcoast.org/projects/north-norfolk-wilder-wetter-better-for-nature/

Norfolk Rivers Trust staff carrying out fish survey

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River restoration scheme at Warham

How do they do it?

The project will take a source to sea approach, extending inland to reconnect the North Norfolk coastal plain to the headwaters. Informed land-use change, and management actions will deliver in the short-term diverse grazing marsh, a range of dry grasslands and scrub mosaics as well as restoring areas of sand dune.

In the longer term this will also enable the coastal plain to function as a fully dynamic environment as sea levels rise and saline/brackish habitats roll landwards and up the river valleys.

NRT will utilise their experience in restoring (or re-wiggling') water courses and reconnecting rivers with their floodplains wherever possible.

What have they achieved?

A significant proportion of the 5,000ha of land has been subject to an ecological baseline survey. Land Management Plans are currently being developed with each land manager, setting out the habitat creation or restoration proposals for their field parcels.

A bespoke business plan is being developed for the project, with a legal team exploring appropriate governance options to establish a 'single legal entity' to manage the project in the long term.

What's next?

The short-term focus of the project is to successfully complete the six key deliverables required by Defra during the Project Development Phase (PDP) which runs until June 2025:

- Land Management Plan
- Monitoring & Evaluation Plan
- Blended Finance Plan
- Governance Plan
- Site Access Plan
- Stakeholder Engagement Plan

The project will then enter into a period of negotiation with Defra (referred to as the 'bridge' period) which is anticipated to last for up to six months.

Subject to the successful outcome of this negotiation phase, the project would then enter into a long term 20-year agreement to implement the agreed habitat and access enhancements.

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Norfolk's farmland

Norfolk’s diverse landscapes have nurtured a high level of biodiversity and have also deeply influenced the county’s cultural fabric. Intricate networks of rivers and waterways and fertile soils of its agricultural heartland have underpinned the county's farming heritage, visible in the historic mills dotting the landscape and in the ongoing reed and sedge cutting for thatched roofs.

Norfolk’s heartland is marked by dense clay soils and small streams amidst heavily farmed land, extending into Suffolk. This region, dotted with wildlife havens, also boasts the county’s oldest countryside landscapes, with intricate mosaics of fields, old hedges, veteran trees, and commons dating back centuries.

Some of Norfolk's hedges date back to the Bronze Age and have remained in place throughout agricultural practices creating planned countryside enclosure during the late eighteenth and nineteenth centuries. These, among other factors, have resulted in a rich history of hedges in our landscape, alongside regular fields. However, the agricultural intensification of the 1940’s to 1970s resulted in the loss of many hedges as fields were made bigger. In many areas, the remaining hedges are not in good condition, with gaps between fragmented sections of hedge and relatively few surviving field oaks in the hedgerows.

Like much of England, Norfolk's arable lands have seen species declines in recent decades. Despite biodiversity losses, it remains a refuge for rare plants, arable weeds, and birds like the turtle dove and tree sparrow.

English oak
Quercus robur

Turtle dove
Streptopelia turtur

Tree sparrow
Passer montanus

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Wildflower field margin and hedgerow showing how agricultural fields can support wildlife and farming together.

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Farmland pressures

Norfolk and Suffolk have a greater proportion of the best grades of food-producing land compared to the average for England (25.5% Grades 1&2 and 53.8% Grade 3 respectively, compared to 16.9% and 48.1% for England) [11]. However modern farming practices and land management techniques can impact the biodiversity and soil productivity of our farmland.

A summary of key pressures on Norfolk's farmland include:

- intensive farming practices, such as use of pesticides and fertilisers, negatively impact soil biodiversity and health as well as invertebrates, including pollinators
- removal and/or poor management of hedgerows removes vital habitat for many species and increases disease introduction
- loss of traditional field margins, small copses, isolated and hedgerow trees limits habitats and wildlife corridors that allow species to traverse agricultural land
- agricultural runoff transports harmful pollutants and excess nutrients into waterbodies and ecosystems, which in extreme cases can create 'dead zones' in aquatic environments
- removal of existing woodland areas to increase farmland reduces biodiversity and contributes to climate change through the release of carbon dioxide
- monocropping and other modern farming practices such as increased specialisation diminishes plant diversity and can make crops more vulnerable to pests and diseases
- soil erosion (especially in the lowland agricultural fens of west Norfolk) due to a variety of factors including stock pressures, lack of ground cover and use of unsuitable land types for agricultural practices
- land use change due to increased pressure for development and housing

Norfolk's farmland can play a crucial role in nature recovery and increasing biodiversity. This is explored further in **Part B: Opportunities Identified**.

Spraying rapeseed near Burgh St Peter

For further details on farmland pressures, visit The Natural Capital Evidence Compendium for Norfolk and Suffolk at www.nsnrp.org/publications or scan the QR code.

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Sustainable farming: Chet Valley Vineyard

The Chet Valley Vineyard (CVV) is a sustainable family vineyard nestled in South Norfolk. The vineyard grows a wide range of grape varieties chosen for their sustainable yields, low input requirements and flavourful taste profile. The grapes are made into the wine at the winery on site – The Chet Valley Vineyard undertakes everything at the vineyard from grape to glass.

From 10 hectares of land, the vineyard produces 29,000 bottles of wine a year. 65% of this is sparkling wine and CVV also produces red, rosé and white. The land is sandy loam down to 1.4 metres and boulder clay (clay with chalk chips) deeper down.

Who's involved?

It is important that the stewardship of the vineyard is represented by a network of interests. CVV are part of the B-line project run by the Bergh Apton Conservation Trust (BACT), creating a network of flowering plants for bees and other pollinators. BACT have also planted hedges on the vineyard.

To monitor and improve biodiversity, CVV collaborate with the University of East Anglia (UEA). They have recommended management practices to boost bird and insect populations.

The Bishop of Norwich (the Church's representative on ecology and biodiversity) has supported on organic management of grapes and the use of disease resistance grape varieties.

The vineyard is undertaking initiatives with the RSPB and Norfolk Wildlife Trust to help their fundraising.

How do they do it?

The proprietor wine maker, John Hemmant, is led by the belief that a diverse natural environment is vital for producing good crops. To this end CVV works to maintain and improve the land.

Recycling waste: The pruned canes are mulched and incorporated into the vineyard's soil, enriching the soil with nutrients.

A significant portion of our surrounding land has been dedicated to the growth of indigenous and useful plant species. The grass is not cut until mid-July, allowing grasses and wildflowers to grow, flower and seed providing food for insects and rodents.

Reducing pesticide use: By widening the space between rows to a rather unconventional 2.4m and leaving indigenous plants such as grass and alfalfa to grow in between, CVV greatly encourages soil stability, whilst implementing a creative solution to fungal attacks. This is supported by the selection of vine varieties most resistant to disease.

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Chet Valley vineyard at sunset

What have they achieved?

CVV has successfully diversified the ecosystem from a monoculture of cereal crops to a richly biodiverse environment.

The following has been mapped:

- mature hedgerows
- mature tree avenues
- floral headline
- vine avenue
- scrubland
- pollarded avenue
- pond environment
- open grassland

Populations of voles and mice have developed, providing a food source for owls and kestrels.

The number of plant species have increased, new arrivals include Bee Orchids, Marguerites and Kingcups not previously found at the Chet Valley Vineyard Limited, alongside reeds and rushes not previously found on the site.

What's next?

The aim is to place nest boxes that would facilitate the establishment of sustainable populations of kestrels and little owls.

To ensure there is local support for sustainable land management, a broader population of individuals will be engaged into a project of biodiversity.

The carbon footprint of the site has been reduced by 6 tonnes. The site is now a positive sequester of carbon, it is carbon negative.

Find out more at www.chetvineyard.co.uk

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Woodland, trees and scrub

Norfolk has blocks of priority deciduous woodland across the county, excluding the Fens. This includes ancient woodlands, wet woodlands known as carrs, normally comprising alders, willows and birches, areas interspersed with old trees, and woodlands that were used for grazing. The Norfolk and Suffolk Broads hold some of the largest extent of wet woodlands in the UK, and south and mid Norfolk is notable for scattered ancient oak, ash, and hornbeam woods. Many Norfolk woods have a history of active coppicing, including Hockering Wood with its cathedral-like stands of small-leaved lime. Scrub around these woods provides shelter and food for birds, insects, and mammals.

Woodlands are under intense browsing pressure from increased deer and squirrel numbers. Some ancient woodland sites have seen changes due to planting with monocultural and same aged plantations with little resilience to climate change and pests and diseases. Places like Foxley Wood National Nature Reserve, which is notable for its springtime carpet of bluebells, are being managed sensitively to benefit the wildlife of this native deciduous woodland. Efforts to replace high density planting with native broad-leaved trees are helping to restore the natural ground cover.

Wood pastures, a type of landscape where trees are distributed across grazing lands, are often found as a component of parkland, heaths and grazed commons. Although many of these areas have fallen out of management and are overrun by shrubs and young trees, they still contain older veteran trees that once dotted the landscape.

Veteran trees in the parklands National Trust Blickling Estate.

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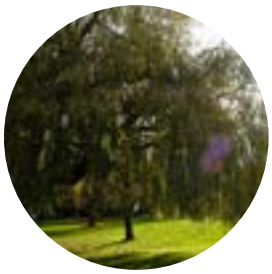
Some of Norfolk's oldest and most majestic trees are in the parklands of large estates associated with grand houses, like Blickling, Holkham, and Houghton, where they add to the beauty and history of the landscape.

Traditional orchards were located on the edges of villages across the county, with a particular concentration in the west of Norfolk, and within the Claylands. These consisted of mixed orchards of fruit trees of a range of different and often local varieties that were grown on vigorous rootstocks. The blossom, fruit and unimproved meadow within the orchards, provided a rich habitat. Norfolk is particularly rich in varieties of apple, with 73 recorded (of which 38 are known to exist today).

Scrub is a transitory stage between open habitats such as grassland and closed canopy woodland. It plays a crucial role as a habitat in its own right, supporting a broad range of wildlife, providing a continued source of nectar, fruits, seeds, shelter, breeding and roosting sites. The secretive Cetti's warbler inhabits Norfolk all year round, for example in the mosaic of wet scrub sites in the Yare valley leading downstream and out of Norwich, where scrub habitats are increasingly important.

Alder
Alnus glutinosa



Willow
Salix babylonica

Silver birch
Betula pendula

Small-leaved lime
Tilia cordata

Sessile oak
Quercus petraea

Ash
Fraxinus excelsior

Common hornbeam
Carpinus betulus

Bluebell
Hyacinthoides non-scripta

Crab apple
Malus sylvestris

Cetti's warbler
Cettia cetti

Invasive species

Muntjac deer
Muntiacus reevesi

Grey squirrel
Sciurus carolinensis

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Woodland, trees and scrub pressures

Woodlands in Norfolk play a crucial role for biodiversity and recreation, but they face a range of pressures that threaten their sustainability. The Forestry Commission's National Forest Inventory provides detailed information on woodlands across the country, identifying areas larger than 0.5 hectares with at least 20% canopy cover and a minimum width of 20 metres. While this dataset does not explicitly identify timber-producing woodlands, categories such as conifer, young trees, and recently felled areas have been used as indicators of productivity.

The Brecks is a notable example, with 27.6% of its land covered by forest – more than double the national average of 10%. Of this, 18.3% is considered productive, underlining the region's importance for timber supply, energy production from waste wood, and recreation. The UK imports more than 80% of its timber, causing over-reliance of more greenhouse gas heavy materials and deforestation abroad, therefore risking unsustainable management in countries with weaker (or no) regulations. Thetford Forest, at the heart of The Brecks, exemplifies this multifunctional value, drawing 1.5 million visitors annually while supporting both commercial forestry and biodiversity [12].

Key pressures identified by regional experts include:

- climate change impacts such as extreme weather events, fire and drought affect growth patterns, water availability, and species distribution
- fragmentation and isolation of woodlands puts species at risk of local extinction as natural processes are limited, for example mobile species may be unable to migrate between locations
- deer and grey squirrel populations cause overgrazing, which reduces the regrowth of young trees
- pests and diseases, resulting in conditions such as Acute Oak Decline and Ash dieback, have surged across the UK, threatening tree populations. Novel diseases are expected to increase in future, providing further challenges for biosecurity
- recreational pressures create the need to balance protecting space for nature with the benefits of access to nature for people
- invasive non-native species increases competition and diseases to native species.

While these pressures are substantial, they also create opportunities to rethink management approaches and enhance the resilience of Norfolk's woodlands. These opportunities are discussed in **Part B: Opportunities Identified**.

For further details on woodland, trees and scrub pressures, visit The Natural Capital Evidence Compendium for Norfolk and Suffolk at www.nsnrp.org/publications or scan the QR code.

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Cycling through Broadlands woodlands - Striking a balance between conservation and providing access to nature.

Restoring wood pasture: Oxburgh Estate

The historic estate at Oxburgh once stretched over 1,442 hectares including arable farmland, villages and parkland habitat. By the time Oxburgh Estate was given to the National Trust in 1952, much of its estate had been sold. Work is being undertaken to restore 70 hectares of the original 162 hectares of historic parkland habitat. Four hectares of conifer plantation are also being restored back to native woodland.

Wood pasture and parkland is a rare and threatened habitat. It's been in decline since the 1950s due to the repurposing of land to help feed the nation after the Second World War. Tree planting restores the historic parkland landscape while providing a new habitat and ensuring future succession of the few veteran and ancient trees that remain. Trees bring a wide range of benefits including soil improvement, water retention, biodiversity, carbon sequestration and they also support our physical and mental wellbeing.

Who's involved?

Restoring the parkland habitat was part funded by Countryside Stewardship from Natural England with strong support from Historic England.

Green Light Trust assisted with tree planting in the woodland area. The Green Light Trust supports children, young people, and adults to refocus their lives through the power of nature.

Breckland Council provided £25,000 to set up the woodland planting area, including deer fencing and tree planting supplies.

What have they achieved?

Phase 1(2021/22): 147 specimen trees, including oak, white willow and the rare black poplar, were planted. These will help to recreate the look of the original parkland and will grow alongside the remaining 10 ancient trees.

Phase 2 (2023): Breckland Council supported the National Trust to plant 2,400 trees at Oxburgh Estate to restore part of a broadleaved woodland (Home Covert) that was previously conifer plantation.

Phase 3 (2024): 80 specimen trees were planted in historic locations to restore an area of parkland called West Park that has been reverted from arable fields.

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How do they do it?

In the woodland area at Home Covert, a felling licence allowed the project to remove the non-native conifer plantation. This has been replanted with native broadleaf trees across 4 hectares and fenced to prevent predation by deer.

The newly acquired land was used for arable farming for over 70 years. It was left fallow while we conducted research. Using an Ordnance Survey map from 1904 and RAF photography from 1946, the team has been able to research how the landscape looked when it was at its peak. In 1951 much of the estate was sold. Sales records, which detail trees sold at auction (to be cut for timber), were used to identify the individual locations and suitable species of trees to replant.

In the parkland areas, the area was resowed with a wildflower mixture and specimen trees were planted in historic locations with supports and rustic tree boxes as protection from cattle.

What's next?

The growth of newly planted trees will be monitored and any that fail will be replaced in the coming years. The habitat as a whole will be monitored for its condition with help from volunteers and staff using the National Trust's Nature Monitoring Framework.

Find out more at www.nationaltrust.org.uk/

One of the newly planted Lime trees at Oxburgh Estate. Many of the trees planted reflect the original species but some changes were made where the impacts of climate change would mean the original trees would not thrive.

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Freshwater habitats

Freshwater habitats include rivers and streams, freshwater reedbed and still waters, including ponds or lakes. All of them are rich in species biodiversity, vulnerable to human impact and contribute to natural processes, including wider environmental benefits such as flood management. The lowland fen and reedbed habitats of Norfolk are regionally important, and together with neighbouring Suffolk, the region holds 20% of England's lowland fens and 45.8% of its reedbeds [11].

Norfolk's chalk streams and rivers (**Figure 5**) are globally important. Of the just over 220 that exist in the world, twenty-six are in Norfolk [11]. They are fed by the chalk aquifer with clear, mineral-rich water and provide a habitat for species such as the globally-endangered white-clawed crayfish and the critically-endangered European eel.

Norfolk's streams flow into rivers like the Bure, Wensum, Yare, and Waveney, supporting linear networks of diverse habitats of wet woodland, scrub, fens, grazing meadows, ponds, and ditches within the farmed countryside. The Nar and Wensum rivers are of national importance, with unique chalk streams of the Bure, Yare, Tud and others, adding to the county's character. The tributary streams feeding the main rivers and estuaries often support an intricate linear mix of wet woodland, scrub, grazing meadows, ponds, and ditches within the farmed countryside.

The larger river valleys reveal hidden layers of chalk and other rocks on their sides, and in the west, the land's tilt shows different layers of soil and rock from the coast to the sandy area known as The Brecks. Some of the broader river valleys in their lower reaches have historically been dug for gravel and minerals, and the resultant man-made lakes are often rich in bird and other aquatic life.

Norfolk supports an estimated 23,000 ponds, more than any other English county. Many of these require restoration to reinstate their ecological value. Amongst the priority species that they provide a habitat for are great crested newts; a species whose numbers have declined drastically across the country, but which can be found across Norfolk, with an abundance in The Brecks and in central and south-eastern areas.

White-clawed crayfish
Austropotamobius pallipes

European eel
Anguilla anguilla

Great crested newt
Triturus cristatus

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Figure 5. Map of Norfolk's waterbodies and rivers.

The clear, nutrient-rich waters of the River Wensum, a classic chalk river, flowing through Pensthorpe National Park.

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Freshwater pressures

Freshwater systems in Norfolk face mounting pressures that threaten ecological integrity and vital services. The Water Framework Directive creates an understanding of the quality of freshwater streams, rivers and lakes called water bodies. Surface water quality is a key concern, with few achieving ‘good’ status under current assessments. The majority are classified as ‘moderate,’ based on indicators for the biological, chemical and physical factors assessed. While some improvements are noted, many others have seen a decline or no change. Groundwater quality is also under strain, with the Environment Agency identifying ‘poor’ status across nearly all of Norfolk due to diffuse pollution from agriculture, urban runoff, and point-source contaminants like untreated sewage and industrial discharges.

A view of Felbrigg Hall across the estate's freshwater lake, managed by the National Trust, with patches of algae floating on the water’s surface.

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Flood risk is another significant pressure, with over 11% of Norfolk and Suffolk rated by the Environment Agency as being at risk of at least a 1 in 100-year flood event. This risk is pronounced in key areas such as the Broads, coastal margins, and freshwater wetlands. Additionally, water availability is a pressing issue in East Anglia, the driest region in the UK. Demands for limited water resource - agriculture, public supply, business and environmental need - are exacerbated by projections of a regional net water deficit at 200 million litres per day by 2050. Chalk rivers, globally rare ecosystems that support distinctive species, are particularly vulnerable, with nearly 17% of England's chalk rivers located in the region. Many of these chalk rivers are already in 'poor' or 'bad' condition due to pollution, abstraction, sedimentation, and invasive species [13, 14]. The regions important peatland and wetland habitats are also impacted by the risk of drying out.

Key freshwater pressures identified by regional experts include:

- excessive water abstraction which contributes to low river flows and groundwater input to sensitive wetland habitats
- physical modification of rivers, including dredging and lowering riverbeds and confining them to specific channels for flood defence, drainage, navigation, or other purposes
- pollution from the air and the land which can enrich waters leading to algal blooms, fish mortality and competitive vegetation, such as nettles or course grasses, in wetland habitats
- invasive non-native species which increase competition and diseases to native species, including significant impacts on wetland habitats from increasing deer populations
- climate change which increases water stress within wetlands and affects freshwater species distribution and land management practices
- habitat loss from infilling of ponds, including from lack of management
- increasing salination as more saltwater encroaches upstream into areas of fen habitat or Broads along tidal sections, with potential higher impact than in coastal habitats
- recreational pressures in terms of the need to balance protecting space for nature with the benefits of access to freshwater habitats.

These challenges highlight the need for innovative approaches to restore and enhance Norfolk's freshwater ecosystems. Opportunities to strengthen habitat resilience and improve water management are discussed further in **Part B: Opportunities Identified**.

For further details on freshwater pressures, visit The Natural Capital Evidence Compendium for Norfolk and Suffolk at www.nsnrp.org/publications or scan the QR code.

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Restoring and resurrecting Norfolk's ponds: Norfolk Ponds Project

Ponds are important hotspots for biodiversity and, despite their small size, are of major importance to freshwater biodiversity. The Norfolk countryside probably harbours more ponds (both old human-made and natural ponds) than any other county in England. But, over the last century, at least 8,000-10,000 of these ponds have been filled in. These so-called "ghost ponds" are scattered all across the county.

Those ponds that remain, estimated at around 23,000, are typically highly overgrown with trees and scrub because of a progressive removal of traditional management. This loss and 'mass-terrestrialisation' of ponds has contributed to major biodiversity declines.

Who's involved?

The wider NPP partnership is composed of several organisations including UCL, Norfolk Wildlife Trust, Norfolk Farming and Wildlife Advisory Group, Norfolk County Council, Natural England, Norfolk Rivers Trust, National Trust, Norfolk Biodiversity Partnership, Upper Wensum Cluster Farm Group, Waveney Farming Cluster and the Norfolk Non-native Species Initiative.

The NPP has been supported by funds from its partners, as well as many local farmers and the Natural England District Level Licensing Scheme.

How do they do it?

Reacting to the poor state of Norfolk's pond networks and inspired by the ideas and knowledge of the late Richard Waddingham, a North Norfolk farmer, the Norfolk Ponds Project (NPP) has pioneered pond restoration in the UK. With science support from the Pond Restoration Research Group (PRRG) at University College London (UCL), the NPP has restored over 400 ponds since 2014.

The NPP-UCL partnership has also developed ghost pond resurrection - a new form of pond restoration. This has recently been successfully extended to ancient Ice Age depression ponds in the Brecks region.

Restored ghost pond

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A North Norfolk ghost pond before 2021 (left) and three years post-resurrection (2024, right), now home to 20+ wetland plants, including the only known site for Fine-leaved Water-dropwort.

What have they achieved?

UCL studies of restored Norfolk ponds have shown restoration by major scrub and sediment removal to significantly and rapidly increase the richness of wetland plant, invertebrate and amphibian communities. Two of Norfolk's rarer fishes, the ninespine stickleback and crucian carp have also been shown to benefit.

Pond restoration has also been shown to have significant benefits for the local abundance and diversity of farmland birds, bats and pollinator communities, including many declining species.

UCL monitoring of around 50-60 ponds is showing progressive increases in wetland plant diversity over time, so it is clear that, as long as ponds are occasionally managed (to remove encroaching scrub), restoration benefits are long lasting. Rare plants recorded at restored Norfolk ponds include the Schedule 8 Holly-leaved Naid, Grass-poly and the nationally scarce stoneworts *Tolypella intricata* and *Chara curta*. Remarkably, at least 80% of the NPP's studied restored ponds classify as Priority Ponds based on their plant assemblages.

Ghost pond resurrection has also been shown to result in species rich wetland plant assemblages after just 1-2 years (Fig. 2) and again reveals huge potential to bring high quality freshwater habitats and rare species back into the landscape.

What's next?

Recent studies suggest that restoring large numbers of ponds (10-20) in high density pond patches can significantly increase landscape-scale biodiversity and that local non-restored ponds also experience biodiversity uplift in this scenario. This suggests strong spill-over benefits of restoring ponds.

NPP would like to restore more pond-rich patches in Norfolk's farmland and will look to link these up via intervening pond corridors and stepping stones.
The resurrection of ancient ice age ponds in the Brecklands will also be a prime NPP focus as it will permit range expansions for many of Norfolk's rarest freshwater species.

Find out more about best practices for restoring existing and ghost ponds at norfolkponds.org

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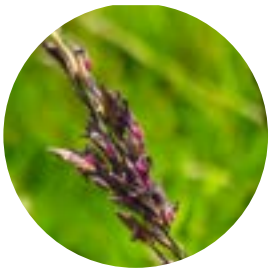
Grassland and heathland

Several different priority grassland habitats can be found in Norfolk. Most widespread is coastal and floodplain grazing marsh, which is associated with the Broads, larger river valleys, and the north Norfolk coast. Lowland calcareous grassland and lowland dry acid grassland are located almost exclusively in the Brecks, often close together due to the unusual geology of the area. There are also some areas of lowland meadow and purple moor grass and rush pasture (the latter mainly located in the Broads), but they tend to be in small, fragmented patches of habitat.

North and mid-Norfolk's once extensive network of pre-enclosure heaths and commons is much reduced following the large-scale reclamations of the 18th and 19th centuries, and widespread planting activities in the 20th century. However, it supports some of the county's and the country's most important dry and wet heath habitats and species. The twin open heaths of Roydon Common and Dersingham Bog in west Norfolk, are a window into Norfolk's historic green landscapes, and support stronghold populations for nightjar, marsh gentian, insectivorous sundews, woodlark and silver-studded blue butterfly.

In north Norfolk, a network of isolated but incredibly biodiverse heaths and wet mires make up what is left of a once much larger area of open heaths on sandy glacial soils, particularly inland from the coast on the Holt to Cromer ridge, and north of Norwich centered on Horsford and North Walsham.

Together, many of these sites make up the 'Norfolk Valley Fens'. The geology and hydrology of these sites is complex and the interaction between groundwater and soils creates intricate species-rich mosaics of acid and alkaline loving plants, often growing within inches of each other in the boggy ground.



Purple moor grass
Molinia caerulea

Nightjar
Caprimulgus europaeus

Marsh gentian
Gentiana pneumonanthe

Sundew
Drosera rotundifolia

Woodlark
Lullula arborea

Silver-studded blue butterfly
Plebejus argus

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The Winterton Dunes, in the Norfolk Coast National Landscape, supports developed areas of dune heath and grassland.

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Grassland and heathland pressures

Grasslands and heathlands in Norfolk are habitats of international significance but face many pressures threatening their survival. Calcareous grassland is found on shallow, lime-rich soils, neutral grassland on clay and loamy soils, and acidic grassland on sands, gravels and siliceous rocks. Found on predominantly nutrient-poor soils, these habitats are home to a vast range of plants such as heathers, gorse, wildflowers and grasses adapted to their specific conditions.

Lowland heath and dry acid grasslands are now rare, making up just 0.5% of England's land area. However, Norfolk, along with Suffolk, holds a disproportionately large share of these habitats, including 8.4% of England's lowland heath and 27.7% of its dry acid grasslands. Much of this is concentrated in The Brecks and Norfolk Coast National Landscape, highlighting their importance locally and nationally [11].

These ecosystems are highly vulnerable to human activity and environmental change. Fragmentation from historical habitat loss has reduced these habitats to small, isolated patches, making them more prone to degradation. Nutrient runoff from farmland and deposition from air pollution alters species composition, encouraging grasses that outcompete flowering plants and reducing biodiversity. Rising temperatures and frequent droughts linked to climate change further shift species dynamics and increase summer fire risks, which can permanently alter habitat structure. These pressures demand urgent action to safeguard the region's grasslands and heathlands.

Key pressures identified by regional experts include:

- disturbance susceptibility demonstrating incompatibility between habitat and site access due to species sensitivities
- high nutrient runoff and atmospheric pollution from farmland and infrastructure respectively, affects vegetation and can alter habitat composition (eg by encouraging more grass growth which outcompetes flowering plants)
- over- or under-grazing or mechanical management impacts habitat structure
- summer wild fires change vegetation structure and composition following the fire
- habitat loss and fragmentation from housing development, road development, agriculture, forestry. Nationally, 85% of heathland and 96% of lowland hay meadows have been lost over the last 150 years
- climate change which can lead to changes in species composition (linked to changes in hydrological conditions, more frequent droughts warmer temperatures causing grass species to become more dominant or allowing invasive species to establish, and, due to higher temperatures, a higher frequency of fires.

Addressing these pressures requires focused efforts to restore and enhance Norfolk's grasslands and heathlands and strategies to achieve this are discussed in **Part B: Opportunities Identified**.

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For further details on grassland and heathland pressures, visit The Natural Capital Evidence Compendium for Norfolk and Suffolk at www.nsnrp.org/publications or scan the QR code.

The Brecks – a rare and vital habitat, home to unique wildlife and in need of continued care to thrive.

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Urban and built environment

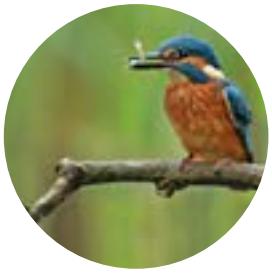
Norfolk, mostly countryside by English standards, features significant urban areas like Norwich, King's Lynn, and Great Yarmouth, alongside the growing market towns of Aylsham, North Walsham and Fakenham. These urban areas are important for the county's cultural heritage, but also support diverse habitats and species, bringing nature closer to people. This can be exemplified by the breeding peregrine falcons found at both Cromer church and Norwich cathedral.

The Yare and Wensum river valleys act as green and blue corridors through and around Norwich city, where vibrant flashes of kingfishers are a common sight. Mousehold Heath, once a vast 10-mile open heath, is now mostly wooded public open space and nature reserve that lies within the city.

Around Great Yarmouth, flocks of birds and even otters can be spotted at the Breydon Water estuary, the gateway to the Broads river system. Nearby, North Denes is famous for supporting nesting little terns. In King's Lynn, located at the edge of The Wash, the Gaywood River, flowing from the chalk lands to the east into the town centre, supports a variety of species including water voles, which thrive along its banks.

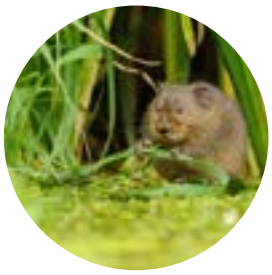
Open Mosaic Habitat (OMH) on previously developed land, such as former industrial estates and disused areas, is playing a role in our ecosystems as some species adapt to living in our more urbanised areas. Foxes and endangered swifts have adapted to urban living due to loss of natural habitats. Swifts, often seen in early summer flying over urban areas like Norwich and Wymondham, are still declining due to fewer urban nesting sites.

Peregrine falcon
Falco peregrinus

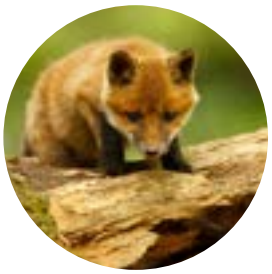


Kingfisher
Alcedo atthis

Little tern
Sternula albifrons



Water vole
Arvicola terrestris



Red fox
Vulpes vulpes

Common Swift
Apus apus

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Weaving nature into high quality design for housing, road, rail and energy infrastructure projects helps create nature rich places. When combined across the country, private gardens are larger than our National Nature Reserves, so have great potential to help recover nature, from window boxes to stepping stone ponds and mini-meadows. Our public spaces, parks, street trees and road verge grasslands and hedgerows can also be utilised for people and nature when managed well, and there is something that every community in the county can do, from wildlife friendly management of community green spaces to tree planting.

A view of Norwich from Mousehold Heath, where green spaces blend with the historical architecture of the city.

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Urban and built environment pressures

In 2021, Norfolk had a population of 916,120, which is projected to increase by an average of 12% to 1.03 million by 2043 (**Figure 6**). Based on data from 2022, just under 16% of this population resided in the urban centre of Norwich, with a total urban population for Norfolk of just over 429,000, or 50% [15 - 17]. Consequently, approximately half of people in Norfolk live in smaller towns or rural settlements. Heavy human activity and the limitation of quality habitats in urban areas can impact on local wildlife and biodiversity.

Key pressures identified by regional experts on habitats and species in urban areas include:

- urban expansion often leads to the destruction and fragmentation of natural habitats, making it difficult for species to survive and thrive
- garden design features and practices such as solid fencing and use of chemical treatments
- air, water and soil pollution caused by transport, construction and other infrastructure in urban areas, can harm wildlife and degrade natural habitats
- heat islands – urban areas which are warmer than their rural surroundings – due to human activities and infrastructure, which can stress local flora and fauna
- invasive species can be more prevalent in urban environments, which can outcompete native species and disrupt local ecosystems
- artificial light and noise from urban areas can interfere with the natural behaviours of wildlife, such as migration, reproduction and feeding
- resource competition caused by urban expansion increases competition for resources like water and food in rural areas, which can negatively impact local wildlife populations.

There are multiple opportunities for individuals and communities to reduce these pressures in urban and built environments and potential measures to achieve this are discussed in **Part B: Opportunities Identified**.

For further details on urban and built environment pressures, visit The Natural Capital Evidence Compendium for Norfolk and Suffolk at www.nsnrp.org/publications or scan the QR code.

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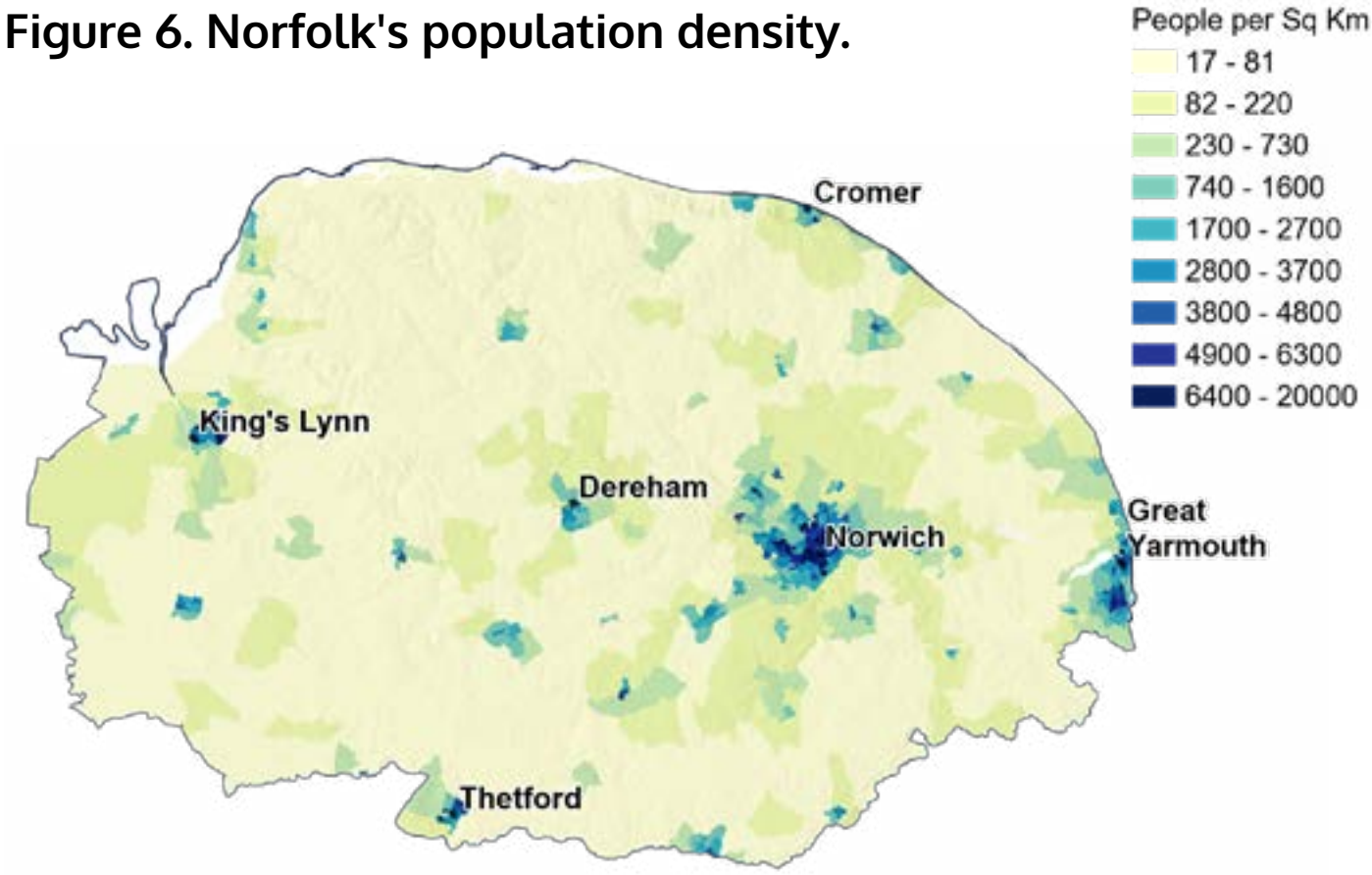
Figure 6. Norfolk's population density.



Urban areas like Great Yarmouth provide vibrant spaces for communities but can face challenges balancing growth with biodiversity and habitat preservation.

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Community driven nature recovery in urban and developed areas: Sweet Briar Marshes

Green spaces enhance connectivity for nature and people. Sweet Briar Marshes, a 90-acre site near Norwich, demonstrates this with its diverse habitats of fen, meadow, marsh, hedgerows, and woodland. Once at risk, a 2022 public appeal allowed Norfolk Wildlife Trust to save it. Now a flagship urban nature recovery site, it plays a vital role in supporting the city's biodiversity and green infrastructure.

Who's involved?

Norfolk Wildlife Trust (NWT) leads the Sweet Briar Marshes project with support from Norwich City Council, local community groups, and NWT supporters. Aviva provided crucial match funding, the Biffa Award, as part of the Landfill Communities Fund, paid for essential infrastructure and Landscape and architects Sheils Flynn collaborated with NWT and the community to shape the future vision for the site.

What have they achieved?

Established an Ecological Baseline
The project set up comprehensive wildlife monitoring using environmental DNA and identified key species like water voles, which informs ongoing habitat management.

Engaged Local Communities
The project involved over 1,000 local residents and stakeholders in shaping the future of the marshes, while 380 volunteers contributed over 2,000 hours of conservation work, highlighting strong community support.

Enhanced Accessibility
Collaboration with groups like Inclusive Norwich ensured the reserve is accessible to people of all abilities. The creation of accessible pathways and facilities enables everyone, including those with disabilities, to enjoy the reserve.

Guided walk at Sweet Briar Marshes.

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How do they do it?

Urban-Adapted Habitat Management
NWT uses specialised techniques to manage wetland habitats in urban settings. GPS-managed cattle grazing helps maintain habitat quality and biodiversity.

Community Involvement
The project reconnects local residents with nature through accessible boardwalks and viewing platforms. Over 50 on-site events were held before its May 2024 opening. Groups such as New Routes, supporting refugees, and Vision Norfolk, aiding those with visual impairments, have been involved.

Education and Citizen Science
Educational programs will expand with a Youth Forum and Advisory Board. Citizen science initiatives engage the public in wildlife monitoring and conservation, deepening their connection to the marshes.

What's next?

The future of Sweet Briar Marshes will unfold in several phases:

- **Phase 1 (2024):** Secure fencing and gates, introduce grazing cattle, and add signs, maps, and cycle racks.
- **Phase 2:** Build the accessible Upland Route with seating and a more rugged West Loop. Plan accessible parking and toilets.
- **Phase 3:** Add lookout decks and bird viewing points, outdoor classrooms for schools, and volunteer facilities near Burnet Way.
- **Phase 4:** Explore a tree canopy aerial walkway and a pedestrian bridge over the River Wensum for better access.

Find out more at www.norfolkwildlifetrust.org.uk/SweetBriar

Aerial view of Sweet Briar Marshes, important for Norwich's green infrastructure.

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Distinct areas: The Broads

The Broads National Park, extending into Suffolk, is one of Britain's most famous and biodiverse landscapes. The area is crisscrossed with rivers and wetlands collecting water from two thirds of Norfolk and North Suffolk. It supports a unique patchwork of open water, estuary, coast, peat fens, reedbeds, wet woodlands, and wet grasslands. Healthy peatlands help us adapt to climate change by capturing carbon. The Broads is a significant area of lowland peatland, with over 60 medieval peat diggings. It is the largest protected wetland area in the country.

Threatened species like the swallowtail butterfly (found only in the Broads), little whirlpool ramshorn snail, fen orchid, and bittern are under intense conservation action. The bittern and marsh harrier's recovery from near extinction are recent success stories. The common crane, extinct in the UK since the 17th century, recolonized naturally in 1979, with the first nest in 1981 and first chick fledged in 1982. Now, the Broads supports over 40% of the UK's 48 breeding pairs.

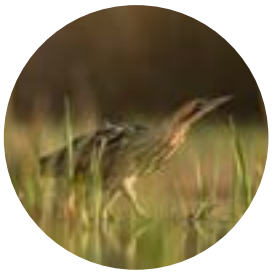
However, the Broads are more than a conservation area; they are an active economic resource facing challenges from recreation, water quality, flooding, drought, and the threat of rising sea levels from the North Sea. Securing climate change resilience requires everyone to work together to plan for its future.

Find out more at www.broads-authority.gov.uk

Swallowtail
Papilio machaon

Little whirlpool ramshorn snail
Anisus vorticulus

Fen orchid
Liparis loeselii



Bittern
Botaurus stellaris

Marsh harrier
Circus aeruginosus

Common crane
Grus grus

The Norfolk Broads.

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Distinct areas: The Brecks

Straddling the Norfolk-Suffolk border, The Brecks is one of England's most biodiverse regions. Even as one of the driest areas in the country, it supports a rich mosaic of woodland, grass heath and heathland, rivers, wetlands, and farmland, hosting 2,149 priority species that are rare or threatened. This includes birds like the stone curlew (40% of the UK population), woodlark, and nightjar, along with rare plants such as creeping marshwort and spring speedwell. Many of these species are nationally significant making The Brecks crucial for their survival.

The Brecks' conifer woods, planted for commercial purposes in the 20th century, have become a distinctive part of the landscape, alongside the lines of Scots pines, originally planted to combat soil erosion. However, open heath areas are now limited and mostly found in protected areas, despite efforts to create corridors for these habitats and integrate conservation through forest management.

Pingo ponds in Thetford Forest.

The Brecks' unique features include meres that have changing water levels due to their connection to the chalky underground rock. Equally fascinating are pingo ponds, formed from the freeze-thaw cycles of past glacial periods, creating distinctive pools and chalky ridges that support grassland plants. These are now key habitats for breeding amphibians, including the Northern pool frog, which became extinct in the UK at the end of the 20th century but was re-introduced at two sites in The Brecks.

Stone curlew
Burhinus oedicnemus

Woodlark
Lullula arborea

Nightjar
Caprimulgus europaeus

Creeping marshwort
Apium repens

Spring speedwell
Veronica verna

Northern pool frog
Pelophylax lessonae

Find out more at brecks.org

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Conserving the Brecks: The Brecks Fen Edge and Rivers Landscape Partnership

The Brecks is landscape spanning 393 sq. miles across Norfolk and Suffolk. One of the driest UK habitats, the Brecks has both sandy and chalky soil, lowland forest, acid grasslands and heathlands, and riparian corridors, creating an important and ecologically diverse habitat. Between 2020-2024, the landscape has been the focus of the Brecks Fen Edge & Rivers Landscape Partnership Scheme (BFER).

Who's involved?

BFER is funded by the National Lottery Heritage Fund (NLHF) and hosted by Suffolk County Council.

BFER has worked in partnership with regional, national, and local organisations to conduct a core programme of projects across the Brecks.

Norfolk Rivers Trust (with match funding from organisations including Coca Cola and the Environment Agency) have conducted assessments and interventions of riparian farmland across the Brecks to protect the rivers. These have included preventing negative run-off, and soil erosion.

The River Lark Catchment Partnership (RLCP) is a volunteer led charitable organisation. RLCP have carried out restoration work in the River Lark, with the support of BFER, Bury Trout Club, the Environment Agency, the Lark Angling Preservation Society, and the Wild Trout Trust.

What have they achieved?

Farm Intervention Work

Through BFER, Norfolk Rivers Trust have conducted 14 interventions on farmland within the catchment of the rivers Little Ouse, Thet, Lark, and Wissey. Completed interventions in tributaries of the Lark and Little Ouse have significantly reduced sediment and nutrient input. Fencing installed alongside the Wissey has allowed for conservation grazing to resume at a County Wildlife Site, which was previously losing habitat and species diversity due to lack of grazing.

River Restoration Work

Through BFER, RLCP have improved the morphology and habitat quality of sections of the River Lark. 1.8km of habitat works were conducted by 89 RLCP volunteers via work parties, improving the natural sinuosity of stretches of the river that had been historically canalised for industrial use. This has improved natural flow and ecological quality, supported priority species, and created new spawning areas for fish.

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Aerial view of the improvements at Fullers Mill river.

How do they do it?

Farm Intervention Work

- Working relationships with landowners were developed through farm visits.
- Flooding, excess sediment, and field run-off were addressed with silt traps and holding ponds.
- Soil erosion was prevented in areas left bare by late harvesting crops, using maize under sowing.

River Restoration Work

- River flow characteristics and channel morphology was re-established with installation of log deflectors, brash bundle shelving, and gravel riverbed augmentation.
- Invasive species such as Himalayan balsam were surveyed and removed.
- Riparian planting was conducted using coir matting.
- Citizen science volunteer training was provided to upskill and provide legacy.

What's next?

A Norfolk and Suffolk farm advisors' network has been established, with monthly meetings allowing for information sharing and future support.

RLCP will continue with volunteer river restoration work on the Lark, including aquatic planting, and will support the National Chalk Stream Recovery Strategy.

Find out more at www.brecks.org/bfer

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Recreational pressures in Norfolk

Tourism is vital to Norfolk's economy, significantly contributing to local income and employment. However, it can also bring substantial recreational pressures, particularly in sensitive areas like the Broads, the Brecks, and coastal sites. In 2023, Norfolk received 51.8 million visits, generating a total tourism value of £3.38 billion, with day trips comprising the majority at 48.56 million visits and £1.77 billion in value [17].

The Broads National Park

The Broads National Park remains a key attraction, offering opportunities for boating, hiking, and wildlife-watching while significantly contributing to the local economy. With 120 miles (200 km) of waterways and 13 broads open to navigation, this unique wetland landscape, home to a rich variety of species, attracted 7.6 million visitors in 2022, generating an economic impact of £711 million. However, heavy recreational use brings challenges, with peak-season visitor footfall leading to soil compaction, bank erosion, and disturbance to nesting birds. Waterborne vessels can also create disturbance and bank erosion. The area's population and tourism growth requires improvements in waste water treatment to further improve the water quality of Broadland rivers. Water pollution, increasing nutrient levels and associated promotion of algal blooms can all have a negative impact on other species.

In addition, rising water levels, frequent droughts and increasing levels of salination pose additional threats to this fragile ecosystem, highlighting the need for sustainable management.

Boats on the Norfolk Broads boost tourism and the local economy but pose challenges like pollution and habitat disturbance.

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The Brecks

The Brecks, with its fragile sandy soils and rare heathland habitats, is another area under strain. This region's popularity for walking, cycling, and exploring historical sites brings challenges. Pathway erosion and habitat fragmentation threaten biodiversity, while under-regulated access disturbs sensitive species. Spanning the Norfolk-Suffolk border, collaborative management between the two counties is essential to safeguard its ecosystems. The Brecks Fen Edge & Rivers Landscape Partnership Scheme has initiated several successful projects and management schemes, demonstrating the importance of cross-border collaboration.

Coastal regions

In 2023, Norfolk's coastal regions attracted approximately 7.35 million visits, generating £237 million in spending. However, this sustained popularity exerts significant environmental pressures. High visitor numbers lead to increased littering, trampling of dunes, and wildlife disturbances, particularly in sensitive areas like Blakeney Point, where seal populations are at risk from human interaction. Additionally, sea-level rise exacerbates these challenges, threatening natural habitats and coastal infrastructure.

Key recreational pressures

- High visitor numbers cause soil compaction, habitat degradation, and erosion in sensitive areas.
- Peak-season demands overwhelm coastal and rural infrastructure, creating strain.
- Human activity disrupts nesting birds, seals, and other species, causing wildlife disturbance at key lifecycle points.
- Recreational activities increase nutrient loads in water, causing harmful pollution.
- Overuse of pathways and open spaces fragments habitats, threatening biodiversity and connectivity.

Grey seal pup at Blakeney Point

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Protecting beach-nesting birds: Return of the tern

The RSPB works at Eccles, Winterton and Kessingland to protect beach-nesting birds. 20-30% of the UK's Little Terns use the beaches between May and August and important numbers of Ringed Plovers also nest. Since the 1980s these species have declined significantly and are amber and red listed birds of conservation concern.

At Kessingland, natural processes are developing vegetated shingle and saline lagoon habitat that also supports Avocets and Oystercatchers. These sites are publicly accessible. Recreational disturbance, alongside predators, limit breeding success. Careful management of these issues is allowing the birds and beach-users to share the same space.

Who's involved?

The project is led by the RSPB in partnership with Natural England. Great Yarmouth Borough Council provides funding as part of their Local Plan mitigation fund. Wildlife Wise will be supporting the work at Kessingland.

The project works closely with local communities and our growing team of over 60 volunteers. There are a wide variety of roles from wardens and monitoring the colonies, volunteer coordination, data and research management, communications support and managing our image library. This allows volunteers as far away as Cumbria to get involved.

The volunteer team have also helped tackle wider issues such as reducing incidents of low flying aircraft over protected sites. Over 2000 hours of volunteer time is given annually.

How do they do it?

The staff and volunteers erect temporary barrier fences in April. The team monitor nesting numbers and operate 24/7 once the first chicks hatch. Techniques including bird-safe lasers, diversionary feeding and night patrols are used to deter kestrels, gulls and foxes.

The team speak with beach users to encourage dogs to be on leads and ensure activities such as kite flying and water sports are undertaken far enough from the colonies to avoid disturbance.

The project runs a programme of community engagement and support events such as the Winterton bioblitz, a time-limited event aimed at recording as many species as possible.

An adult Little Tern on Winterton beach

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A fledgling Little Tern

What have they achieved?

Little Tern numbers have stabilised at around 300 pairs, whilst Ringed Plover numbers have increased from 16 to 29 pairs.

28 Ringed Plover chicks fledged in 2024 compared to none in 2018 and 2019. Whilst fencing and signage provide useful tools to protect beach-nesting birds, experience has shown that wardens are vital. The ability to engage beach users and react to predators to reduce disturbance and chick losses are critical.

This was shown in 2022, when low levels of disturbance and predation saw 650 Little Tern chicks fledged at Winterton. This would not have been possible without the efforts of staff and volunteers. Volunteering has many wellbeing benefits. The project has stories of how working on the colony has helped volunteers overcome serious physical and mental health concerns. It also boosts confidence levels.

To access the remote sites, volunteers who cycle from as far away as Norwich to do their shifts. Some volunteers camp locally and help on the project each year, they say they learn so much from RSPB staff that they can't think of a better holiday experience.

The project has also equipped staff and volunteers to secure conservation jobs.

What's next?

The aim is for the numbers of breeding pairs to grow and more chicks fledging. With changes in beach conditions, it is expected that the colonies will split across multiple sites. North Denes beach at Great Yarmouth has restarted to support Little Terns since they deserted the site in 2010.

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Biological pressures

Invasive non-native species outcompete native wildlife, altering habitats and disrupting ecological balance. In Norfolk, this includes addressing invasive plants (including pests or diseases affecting plants), invertebrates, fish, mammals, the most significant of which are listed in **Figure 7**. Monitoring, habitat restoration, prevention are essential, with collaborative actions key to protecting biodiversity. It is anticipated there will be as yet unidentified diseases presenting additional but currently unrecognised pressures.

Figure 7. Invasive non-native species and significant pests and diseases

Vascular Plants

Floating pennywort
Hydrocotyle ranunculoides

Parrot's feather
Myriophyllum aquaticum

Himalayan balsam
Impatiens glandulifera

Japanese knotweed
Fallopia japonica

Vascular Plants

Giant hogweed
Heracleum mantegazzianum

Rhododendron
Rhododendron ponticum

New Zealand pigmyweed
Crassula helmsii

Pirri Pirri Burr
Acaena anserinifolia

Vascular Plant Pests

Oak processionary moth
Thaumetopoea processionea

Eight Toothed Spruce Bark Beetle
Ips typographus

Vascular Plant Diseases

Acute oak decline
Multiple pathogenic agents

Ash dieback
Hymenoscyphus fraxineus

Vascular Plant Diseases

Sooty Bark Disease
Cryptostroma corticale

Phytophthora
Various species

Sweet Chestnut Blight
Cryphonectria parasitica

Invertebrates

Quagga mussel
Dreissena bugensis rostriformis

Invertebrates

Zebra mussel
Dreissena polymorpha

Signal crayfish
Pacifastacus leniusculus

Killer shrimp
Dikerogammarus villosus

Chinese mitten crab
Eriocheir sinensis

Fish

Top mouth gudgeon
Pseudorasbora parva plantarius

Wel's catfish
Silurus glanis

Grass carp
Ctenopharyngodon idella

Gold fish
Carassius auratus

Mammals

American mink
Neovison vison

Muntjac
Muntiacus reevesi

Grey squirrel
Sciurus carolinensis

*It should be noted that it is anticipated there will be novel, as yet unidentified diseases which will present pressures for the ecosystems of Norfolk but cannot be accounted for at this time.

Areas of Particular Importance for Biodiversity

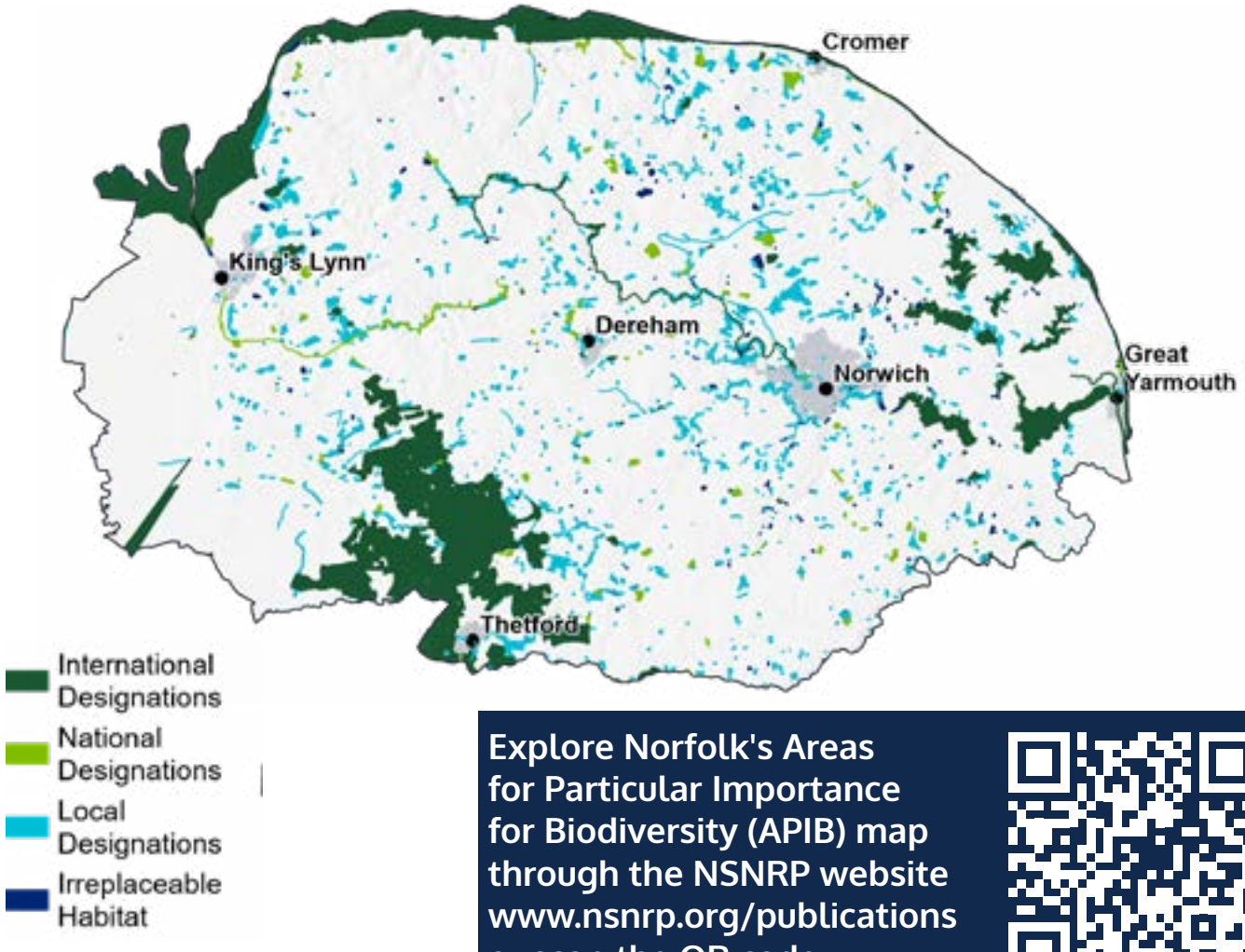
To consider where ambitious nature recovery measures can take place, the locations of the important and diverse habitats that make up the ecological network across Norfolk need to be established. This is achieved within this strategy by creating a single map, identified as the Areas for Particular Importance for Biodiversity (APIB) map (**Figure 8**). This acts to provide a framework of core sites to help identify locations and opportunities for targeting creation of new habitat, or improving, expanding and linking the existing areas. The specific sites included in the map are described below.

Internationally designated sites

Special Protection Areas (SPA)
SPAs are protected areas in the UK, designated under the Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales.

They are areas with the most important habitats for rare and migratory birds within the UK. Alongside SACs they form part of the UK's national site network.

Figure 8. Norfolk's Areas for Particular Importance for Biodiversity (APIB) map.



Explore Norfolk's Areas for Particular Importance for Biodiversity (APIB) map through the NSNRP website www.nsnrp.org/publications or scan the QR code.

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Special Areas of Conservation (SAC)
SACs are protected areas of habitats and species listed within international conventions to which the UK Government is a signatory. They provide protection for types of species and habitat most in need of conservation at an international scale. In England SACs are classified under the Conservation of Habitats and Species Regulations 2017 (as amended) and contribute to the UK's national site network alongside SPAs.

There are both inland and marine SACs around Norfolk.

Ramsar Sites
Ramsar sites are areas of internationally important wetlands designated under the Ramsar Convention [18]. In Norfolk, there is significant overlap between Ramsar sites and SPAs, as many of the wetland sites are protected because of their importance to water birds.

Nationally designated sites

National Nature Reserves (NNR)
NNRs protect nationally important habitats, species and geology across the country, whilst allowing public access and research and monitoring opportunities.

NNRs are managed to high standards for nature by Natural England and its partner organisations, and have legal protections designated under the National Parks and Access to the Countryside Act 1949, Wildlife and Countryside Act 1981 (as amended) and the Countryside and Rights of Way Act 2006.

Sites of Special Scientific Interest (SSSI)
SSSIs are protected areas which contain specific features - either biological or geological - of particular interest to science. These features of interest can range from specific species all the way to whole landscapes of national importance. Natural England are the responsible authority for designating and monitoring SSSIs, which are protected under the Wildlife and Countryside Act 1981.

Local wildlife sites

Local Nature Reserves (LNR)
LNRs are locations of special local interest for biodiversity, or in some cases for geological features. They also offer public access, making them important sites for both people and nature.

LNRs are a statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949, designated by local authorities.

County Wildlife Sites (CWS)
CWS are designed to protect the most important areas for wildlife which are not covered by national designations. Norfolk's network of CWS is designated through a partnership, chaired by the Norfolk Wildlife Trust. All local councils in Norfolk have developed policies that offer CWS some protections.

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There are a significant number of CWS in Norfolk, ranging in size from single ponds to large areas of woodland. They provide vital refuges for wildlife and stepping stones between other areas of habitat. Most are privately owned and managed and the majority are not accessible to the public.

Irreplaceable habitats

Certain types of habitat would be very difficult (or take a long time) to restore, recreate or replace once destroyed, due to factors such as their age, uniqueness, diversity or rarity. Irreplaceable habitats have specific consideration under the National Planning Policy Framework and legal protection under the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations: 2024 [6, 19].

Irreplaceable Habitats in Norfolk are:

- ancient woodland
- ancient and veteran trees
- coastal sand dunes
- lowland fen
- coastal saltmarsh (spartina saltmarsh swards and Mediterranean saltmarsh scrub).

The irreplaceable habitats used in the mapping of APIBs comprises those defined as Irreplaceable Habitats in the ‘Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024’.

Hethel Old Thorn is the smallest SSSI in the UK, designated to protect a single ancient hawthorn tree. Thought to be over 700 years old, it is a rare living relic of medieval Norfolk, rich in veteran features that support diverse wildlife.

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Restoring fens: High Fen Wildland

Naturally acting Fens have almost disappeared from our landscape with drainage starting in the 17th Century. Historically the Fens were home to a huge amount of biodiversity. With heavier rainstorms becoming more frequent, the drained landscape is at risk of flooding in the winter and drying out in the summer.

High Fen Wildland is a 292-hectare site outside the village of Methwold and bordering Stoke Ferry. Until 2007, the land at High Fen was farmed for arable and also daffodil growing. But despite the deep and peaty soils, it was too wet and difficult to farm commercially and was sold. In 2022 Nattergal bought the land.

Nattergal's vision is to rewet the land for as much of the year as possible, and to develop a far greater species richness. They imagine a mosaic of fenland habitats comprised of reed beds, willow carr and open meres. On dry land, a mixture of scrub and woodland is envisaged alongside dense species-rich grassland.

Who's involved?

To get the wildland where it is today and to delivery its future potential has taken a huge amount of time and resources from Nattergal team, the hydrological support of Haycock Consulting ltd, as well as funding from the Fens East Peatland Partnership (FEPP), managed by the Lincolnshire Wildlife Trust, and many more.

Nattergal is pioneering the commercialisation of nature restoration . High Fen is their third site.

How do they do it?

The wildland has a small strip of mixed broadleaved woodland towards the centre, which will be allowed to escape into a neighboring species-poor grassland field, allowing native woodland to develop in this field through natural regeneration. The Willow Carr present in the lower lying areas of the wildland will also be allowed to spread, creating pockets of woodland dotted across the wildland.

In the north-eastern section higher ground is dominated by mature scrub. Nattergal will allow this to billow out into the High Fen Wildland site, enhancing the habitat for species such as turtle dove.

The species-poor grassland on the site was previously used as pony paddocks and is now being transformed through a move to traditional hay meadow management, rather than intensive grazing. During Autumn 2025 areas of 'rough and loose' will be created here, adding topographical diversity with the use of a bulldozer to expose subsoils and create microclimates to allow for a greater flora diversity.

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What have they achieved?

Baselining
To fully understand how the landscape will function in its natural state Nattergal has utilised innovative techniques, such as topography mapping using LIDAR, and the installation of hundreds of water monitoring stations.

Working with the Centre for Landscape Regeneration, the project has discovered that the site's species abundance is poor and concentrated around water. Getting more of the site wet for longer will allow species richness to spill out.

Nattergal have also measured the distribution and depth of the peatland, which urgently needs preserved as a vital carbon store. 40% of the wildland contains peat, which if left to dry out distributes carbon dioxide into the atmosphere. Rewetting the peat and securing the storage of carbon dioxide is a major priority.

Re-wetting
In October 2024 Phase 1 of the Wildlands 're-wetting' project began in the lower lying areas of the wildland. This involved blocking the alluvial layer of sand (which water drained out through), smashing drains, installing a weir and creating 1200m of bunds to stop water flowing out into a huge channel that was built in the 1950s. This safeguards 38.5 ha of wetland.

Using one of the restored wetland sections to hold water allows water to bleed into the surrounding fields, creating shallow pools of water perfect for wildlife. Naturally these pools will dry out just like a historic fen but the water table with remain high.

Find out more at www.nattergal.co.uk/high-fen-wildland

The channel, known locally as the 'cut off channel', that Nattergal are trying to stop water draining into.

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Part B: Opportunities Identified

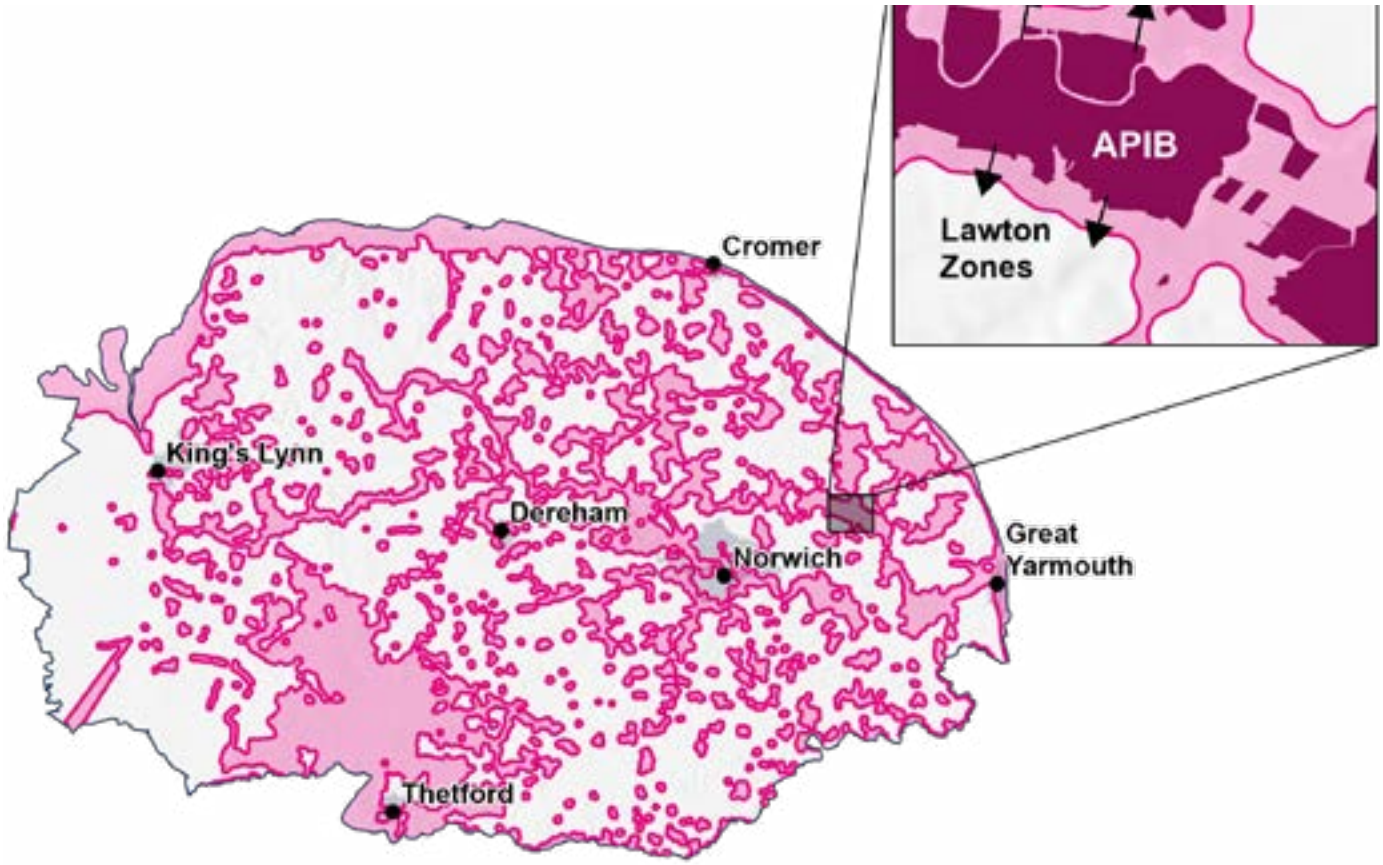
Agroforestry in action at Maple Farm, demonstrating varied planting regimes.

Nature recovery principles

The Lawton Principles, introduced in the 2010 report Making Space for Nature [20], provide a clear way to think about improving nature. They focus on making space for wildlife and ensuring habitats are better connected, more robust, and able to support biodiversity in the long term. These "more, bigger, better, and joined" principles are summed up as:

- **more** means increasing the amount of natural habitat, so there's more space for plants and animals to thrive
- **bigger** refers to making habitats larger. Larger areas are more resilient and support more species over time
- **better** focuses on improving the quality of habitats. This ensures they are healthy and able to support a wide range of wildlife
- **joined** is about linking habitats so species can move between them. This helps wildlife adapt to changes in the environment and reduces the risks to species that live in isolated areas.

Figure 9. Map of biodiversity priorities in Norfolk showing existing APIB habitats (purple) surrounded by a 250 metres buffer or "Lawton Zones" (pink) to expand and connect habitats.



Explore Norfolk's Lawton Zones map through the NSNRP website www.nsnrp.org/publications or scan the QR code.

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In Norfolk's LNRS, these principles are being used to guide decisions about where and how to focus efforts for nature recovery. By following these principles, the strategy identifies opportunities to create a stronger, more connected natural environment that benefits both wildlife and people (**Figure 9**). In order to address the Lawton Principles, we have applied a 250m buffer around Areas of Particular Importance for Biodiversity, priority habitats and churchyards across the county. This size of buffer was chosen as it provides ample opportunity and choices for expanding and connecting habitats across the county.

In addition to "more, bigger, better, and joined," the strategy also incorporates other nature recovery principles to ensure a comprehensive approach:

- **recover** aims to actively restore degraded habitats to their full ecological potential. This could involve enhancing soil health, rewetting drained peatlands, or removing invasive species to allow ecosystems to function naturally again. The actions also aim to support the recovery of existing species.
- **reintroduce or translocate** is about bringing species back to areas where they have been lost or establishing populations in new locations to help them thrive. This can help rebuild balanced ecosystems and restore missing links in food webs.
- **control** involves managing factors that threaten biodiversity, such as invasive species, grazing pressure, or pollution. Effective measures ensure restored and existing habitats stay healthy and productive.

Building on the nature recovery principles, Norfolk's LNRS identifies specific opportunities to restore and enhance habitats across the county, creating more green and blue spaces where most appropriate. These opportunities focus on practical actions that target key habitat types, addressing biodiversity loss and strengthening ecological resilience. By tailoring these measures to Norfolk's unique landscapes, the strategy provides a clear pathway for nature recovery and long-term environmental sustainability.

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Opportunities Identified

The creation of targeted, spatial measures and actions will also provide the opportunity to align with and contribute to the legally binding national environmental objectives and targets introduced by the Environment Act (2021).

- restore or create in excess of 500,000 hectares of wildlife-rich habitat outside of protected sites by 2042, compared to 2022 levels
- halt the decline of species abundance by 2030, ensuring abundance in 2042 is greater than in 2022, and at least 10% greater than 2030
- reduce the risk of species' extinction by 2042, when compared to 2022
- increase total tree and woodland cover from 14.5% of land area to 16.5% by 2050
- improve water quality and availability – reduce nitrogen, phosphorus and sediment pollution by at least 40% by 2038.
- restoration or creation of in excess of 500,000 hectares of wildlife-rich habitat outside of protected sites
- increasing total tree and woodland cover
- improving water quality and availability
- ensuring that everyone in England lives within 15 minutes' walk of a green or blue space
- restoration of 280,000 hectares of peatland in England
- restoration of water bodies to good ecological status
- protecting 30% of land and sea in the UK for nature's recovery by 2030
- supporting farmers to create or restore hedgerows
- managing woodlands for biodiversity, climate and sustainable forestry
- restoration of Sites of Special Scientific Interest to favourable condition
- ensuring climate change adaptability is included in actions and policies
- inclusion of proposals for nature-based solutions which improve flood risk management where appropriate
- reduction in the rates of introduction and establishment of invasive non-native species.

The measures and actions identified for the habitat assemblages and key species in the Norfolk LNRS are aimed to contribute where possible to the national objectives of:

- halt the decline of species abundance
- reduce the risk of species' extinction
- reducing the rates of introduction and establishment of invasive non-native species.

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Bigger, better and more joined up: Langley Abbey Environment Project

Langley Abbey Environment Project (LAEP) is a developer-funded nature reserve spanning South Norfolk and The Broads. The Project is creating and enhancing a mosaic of habitats across the 600-acre Langley Abbey Estate, generating an uplift in biodiversity which can then be allocated to developments in Norfolk and Suffolk achieving biodiversity net gain.

The Langley Abbey Estate straddles the Broads National Park and South Norfolk Claylands. It is surrounded by over 2,500 hectares of SSSIs within a 10km radius, embodying the Lawton Principles of 'more, bigger, better and joined up'.

Alongside seeking to restore biodiversity, their other key objectives include reducing carbon emissions through peatland conservation and improving water quality in the Yare Valley.

Who's involved?

LAEP is owned and maintained by the Langley Abbey Estate. Habitat monitoring is conducted by Wild Ecology and overseen by South Norfolk District Council and the Broads Authority.

LAEP is also participating in several peat projects, alongside partners Defra, UK Centre for Ecology & Hydrology, Broads Authority, Cranfield University, Water Management Alliance, Broadland Abstractors Group, ADAS and Quanterra.

What have they achieved?

The Project has recently signed off on the creation of over 25 hectares of species-rich grassland, hedgerows and scrub which resulted in over 20,000 saplings being planted in winter 2024.

LAEP is also spearheading collective efforts to conserve over 1,000 hectares of deep peat in the Yare Valley. Engagement with landowners and other stakeholders is ongoing and the Project is currently exploring funding opportunities.

Sunset on Pump Marsh, a favourite of Marsh Harrier, wildfowl and waders

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Case Study

The Abbery Carr, home to a herony, rookery and abundant woodcock

How do they do it?

LAEP is maintained by a dedicated local team with the hope that, once restored, the habitats will support dynamic ecosystems that can incorporate conservation grazing. Habitat restoration will initially require human intervention and volunteers are due to support with tree planting efforts throughout winter 2024.

To aid public engagement, ultrasonic and acoustic detectors are used to record bird and bat populations alongside a trail camera.

The project is leading efforts to protect lowland peatlands. Changes in the peat and water table throughout the seasons are monitored using a peat camera and dipwells. A flux tower is used to track carbon emissions.

What's next?

Phase 1 is underway with Phase 2 imminent. The next phase of work will be establishing a lowland meadow in summer 2025 and the enhancement of nearly 3km of ditches within the Broads National Park.

The long-term objective is to see the entire Langley Abbey Estate managed for wildlife and future phases of the Project will be brought forward as LAEP increasingly assists developers across Norfolk and Suffolk achieve biodiversity net gain. LAEP hopes to be an integral piece in the Nature Recovery Network and support the delivery of the LNRS.

Find out more at www.langleyabbeyestate.co.uk

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Habitat opportunities

The following opportunities outline key actions across Norfolk, linking to the habitat areas outlined in the description of the strategy area.

Coastal opportunities, within maritime cliffs, sand dunes, vegetated shingle, saline lagoons, saltmarsh and mudflats.

- Allow natural coastal processes where possible and appropriate to enable habitats to develop, move, and function naturally, also incorporating creation of replacement habitat inland to mitigate for climate change and losses.
- Manage recreational pressures, in particular linked to the Norfolk Green Infra-structure and Recreational Impact Avoidance Mitigation Strategy (GIRAMS).
- Provide benefits to the marine environment and align with appropriate environmental plans
- Improve conservation techniques to restore and enhance existing habitats.

Woodland, Trees and Scrub opportunities, creating new deciduous, productive and mixed woodlands and improving existing areas, including wet woodlands, wood pasture and parkland and trees outside of woodlands. This incorporates both planned planting schemes following the principle of 'the right tree in the right place' and natural regeneration and colonisation where possible.

- Improve resilience through appropriate management techniques to promote structural and age diversity.
- Connect existing woodlands and create new areas using a diverse mix of appropriate tree species and shrubs, including native species where possible.
- Protect and conserve significant trees and woodlands.
- Identify new sites for orchards in rural and urban areas.
- Increasing urban planting.
- Manage deer populations to sustainable levels and control invasive species such as grey squirrels.
- Create new areas of scrub and open space as transitional habitats.

Freshwater opportunities

- Restore and enhance existing rivers, streams, and ditches, including control of invasive species.
- Improve water resource and water quality management through nature-based solutions.
- Strengthen the mosaic of wetland habitats along river channels.
- Enhance river, riparian, and floodplain habitats.
- Restore and enhance chalk stream habitats.
- Create and restore still water habitats eg ponds and pingos.
- Restore, maintain, and enhance lake and broad habitats.
- Create new freshwater habitats, such as reedbeds, grazing marsh, and lowland fen.
- Benefit the marine environment by improving the quality of freshwater entering it.

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Grassland and Heathland opportunities

- Connect, expand, and enlarge grassland and heathland areas.
- Restore and enhance grassland and heathland, promoting effective management techniques and controlled grazing regimes.
- Protect and conserve significant existing habitat areas.
- Incorporate mosaic features within habitats.
- Remove encroaching habitat where appropriate.

Farmland opportunities

- Connect, expand and enhance areas of arable field margins.
- Enhance and restore hedgerows and hedgerow trees.
- Promoting effective management techniques and controlled grazing regimes.
- Incorporate mosaic features within habitats.
- Restore farmland ponds and improve riparian habitats.
- Use sustainable and regenerative practices to improve soil and water quality, including where appropriate paludiculture in high water table areas.
- Implement varied planting techniques to enhance biodiversity eg mixed cropping, agroforestry.
- Maintaining and enhancing food production.

Urban opportunities

- Increase the numbers of trees and other appropriate vegetation within urban areas.
- Improve green infrastructure aspects including green crossings and buffer areas, sustainable drainage systems and schemes, green roofs and walls.
- Encourage nature friendly management practices and activities within public spaces, communities and new developments. For example, local plan site allocations require the provision of open spaces and seek to improve connectivity to existing networks.
- Establish connectivity between gardens and public spaces.
- Incorporate retrofitted features into building work and transport networks.

Mosaic habitat creation opportunities

Using combinations of habitat types within the Norfolk landscape, there is the possibility to create dynamic mosaic areas, where diversity can be maximised using varied vegetation structure and successional or transition zones and ecotones. These areas will become naturally messy and be representative of allowing natural processes to occur. Mosaic habitats are beneficial to species as they can maximise the resilience of an area to change, due to the presence of varied habitat features eg still water habitats, trees and scrub.

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Community conservation: Little Ouse Headwaters Project

Founded in 2002, the Little Ouse Headwaters Project (LOHP) is an award-winning initiative that brings local people together to protect, manage and celebrate a special landscape of biological, cultural and historic value.

The project focuses on a complex of fens, wet woodland and grassland along 5 km of river valley on the Norfolk-Suffolk border close to the villages of Thelnetham and Garboldisham. Alongside conservation activities they run social events, guided walks, talks and an annual art exhibition.

The project's core aim is the creation and restoration of wetlands, including rare calcareous fen habitat which is of national significance for its plants. All of the work is based on the principle of 'people working with and enjoying nature', both to restore and offer access to tranquil countryside.

Who's involved?

LOHP has a membership of approximately 200 local residents, ably coordinated by the Conservation Manager. Volunteers are fundamental to the ethos of LOHP and help to manage the land with weekly work parties as well as organising events.

LOHP works in collaboration with Suffolk Wildlife Trust and is a partner in the Waveney and Little Ouse pilot Landscape Recovery Project (WaLOR). Several areas of fen are leased from Poor Fen Trusts. Parts of the land are SSSI or SAC so we work closely with Natural England.

LOHP has received long-term support from both Heritage Lottery Fund (HLF) and Esmée Fairbairn Foundation along with various local charities and trusts and our members. They work with graziers and, where possible, local contractors to deliver our management aims.

Volunteers clearing fen vegetaion

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How do they do it?

The development phase of the project has involved extensive consultation and engagement with landowners (farmers) to secure buy-in for an ambitious vision for land-scape scale habitat and ecosystem restoration. The innovative approaches being taken by the project include:

- use of natural capital and ecosystem services metrics to quantify the public benefits delivered by proposed habitat and ecosystem restoration and landuse change,
- developing a bespoke approach to valuing these to make their delivery attractive to landowners and competitive with other land management options without undermining food production,
- developing the legal and business structures to enable multiple landowners) to pool the ecosystem services (or credits) they can offer and sell them through a single legal entity.

Planned habitat and ecosystem restoration includes 'Stage Zero' river restoration on a section of the River Waveney just upstream of Roydon Fen nature reserve.

This would see the river restored to its natural, meandering course from its current canalised channel alongside the restoration of a functional floodplain and wetland habitats.

What have they achieved?

LOHP have purchased 31 ha of land and currently lease an additional 46 ha. Habitat management is fine-tuned to the requirements of individual areas, wherever possible restoring rich communities of fenland plants. Ongoing monitoring shows that the diversity of wetland vegetation is now far higher as a result of our management.

Amongst the most spectacular successes has been the restoration of an area now known as 'New Fen', purchased with a HLF grant in 2014. Originally, this was a tree nursery and a degraded fen that had become closed-canopy willow scrub. Clearance of the planted trees has created open woodland and scrub, and removal of the willows has led to the emergence of a remarkably rich fen flora containing Southern Marsh Orchid, Marsh Lousewort, Yellow Rattle and Meadow Rue.

All of this has been achieved in less than 10 years thanks to a massive volunteer effort.

What's next?

As well as the ongoing maintenance of restored areas, the next major project is the creation of a network of diverse ponds across our sites. This will involve the creation of many new ponds and the restoration of existing ponds over a 5-year period. To address wider landscape pressures, the project is contributing to the development of WaLOR to ensure their stewardship is successful in the decades to come.

A longer-term aim is to work with others to establish a more natural continuous river corridor providing extensive wildlife habitat, carbon storage and a range of other benefits.

Find out more at www.lohp.org.uk

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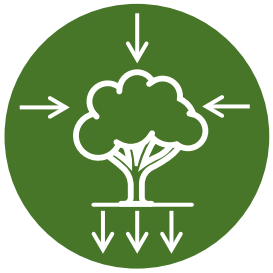
Wider environmental benefits and co-benefits of nature recovery


Air quality


Capturing carbon


Clean water source


Cooling urban areas


Erosion prevention


Flood mitigation


Food provision


Invasive species control


Managing climate resilience


Nutrient cycling


Physical and mental wellbeing


Pollinating crops


Public health and cultural services


Raw materials


Soil health

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The impact of planning actions and measures to recover nature is not limited to species and habitats. Maintaining enough healthy natural capital such as healthy soils, clean rivers and non-polluted air, alongside a diverse range of plants and animals, provides flows of environmental or ecosystem services over time. This shows how nature recovery can play a key role in other priorities for the county, including climate resilience, disease resilience, health and well-being, air and water quality, and wider socio-economic benefits such as job creation and alignment with green infrastructure.

The measures proposed within this strategy are designed to support these additional benefits where possible and these are identified within the tables in **Part C**. These benefits have been highlighted by stakeholders and groups throughout our engagement processes and are integral to this strategy.

Types of ecosystem service can be defined in several ways, but a common approach (originally proposed by the Millennium Ecosystem Assessment, 2005) [21] is shown in **Table 1 (a - d)**.

Key examples are identified below, demonstrating the main benefits that each group of actions could provide alongside achieving the biodiversity priorities. Where appropriate, these can be defined as nature-based solutions, especially those opportunities and suitable locations for undertaking natural flood management, through the creation or improvement of habitat for biodiversity. In addition, actions can link to addressing and controlling access issues, by increasing appropriate areas and protection of sensitive habitats using planned re-direction.

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Table 1a. Co-benefits of nature recovery actions for provisioning services (outputs from ecosystems that meet human needs)

Service	Main Benefits
Pollination of food crops	Pollination of crops and wild plants.
Food production	Arable crops, horticulture, orchards, allotments and community gardens, livestock, wild food and foraging.
Wood production – productive or mixed forestry	Timber, biofuel production, paper, coppiced wood and wood waste.
Fish production	Aquaculture, commercial and recreational fishing.
Water supply	Impact of soil and vegetation on rainwater runoff and infiltration, groundwater recharge or surface water flow.

Table 1b. Co-benefits of nature recovery actions for regulating services (ecological processes that regulate and reduce pollution and other adverse effects)

Service	Main Benefits
Filtering air and water	• Water: Direct uptake by terrestrial or aquatic vegetation of pollutants, interception of overland flow and filtering or trapping pollutants and sediment within vegetation before it reaches watercourses. Natural processes such as nitrogen cycle converting nitrates into nitrogen gas. Infiltration into ground, allowing soil filtration and minimising watercourse pollution. • Air: Removal of air pollutants via deposition and absorption or breakdown via vegetation; includes fine particles, ozone and nitrogen oxides.
Reduction in flooding	Reduction of surface run off, peak flow, flood extent and flood depth through canopy interception, evapotranspiration, soil infiltration and physical slowing of water flow.
Erosion protection	The ability of vegetation to stabilise soil against erosion and mass wastage – providing protection from the power of rainfall and overland flow, trapping sediment and binding soil particles together with roots.
Capturing carbon	Carbon stored in vegetation and soil types. Sequestration is impacted by land use change, habitat loss and soil disturbance. New habitat areas take time to reach the sequestration rate of a mature habitat.
Cooling urban areas	Shade, shelter and the cooling effect of vegetation, in particular in urban areas or parks with trees close to buildings, green roofs and green walls. These can in turn increase efficiency and reduce heating and cooling costs.
Noise reduction	Attenuation of noise by trees and vegetation.
Pest control	Predation of crop or tree pests by natural predators.

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Table 1c. Co-benefits of nature recovery actions for cultural services (environmental settings that enable cultural interaction and activity)

Service	Main Benefits
Supporting physical and mental wellbeing	Evidence that nature-rich green spaces can improve human physical and mental health and wellbeing and can have wider socio-economic benefits. For example, interaction with nature can improve a range of health conditions including heart and lung health, high blood pressure, diabetes, immune function, depression and anxiety..
Interaction with nature	Formal and informal positive nature-related activities, balanced with accessibility and human impacts on nature eg bird watching.
Recreation and leisure	Provision of green and blue spaces used for any leisure activity, linking to target to ensure everyone has access within 15-minute walk.
Aesthetic value and tranquility	Provision of views, surroundings and inspirational experiences – linked to artistic expression and creation.
Education and knowledge	Opportunities for formal and informal education, scientific research, citizen science, local knowledge sharing, volunteer and career opportunities.
Community and sense of place	Aspects of an area promoting special and distinctive features – characteristic species, habitats and landscapes, alongside physical, social, spiritual or emotional importance.

Table 1d. Co-benefits of nature recovery actions for supporting services (functions provided by ecosystems that underpin other services)

Service	Main Benefits
Keeping soils healthy	Healthy soils are essential to food production, water filtration, nutrient cycling and carbon sequestration.
Biodiversity and primary production	Complex ecosystem processes eg photosynthesis and natural system functions of species and habitats.

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Historic environment

In addition, the varied habitats, landscape parks and open spaces in our cities, towns and villages often have a heritage interest. Therefore, the consideration of nature recovery measures and actions should take into account the positive links and benefits to the historic environment 22].

These could include:

- Preserving and enhancing heritage assets, both above and below ground
- Improving the setting of heritage assets
- Improving access to heritage assets
- Creating a sense of place and a tangible link with local history
- Creating links between heritage assets and local nature recovery sites
- Specific actions could include:
- the creation of wildflower meadows in areas of previously cultivated land, protecting these assets from further degradation and damage
- restoration of historic hedgerow areas
- restoring traditional orchards
- improvements to the water quality of historic lakes or ponds.

Health and wellbeing

The Health, Wellbeing and Access sector across Norfolk and Suffolk are considered integral in supporting the possible co-benefits developed, particularly within the Cultural Services sector. The Norfolk and Suffolk Nature Recovery partnership aims to facilitate these opportunities across the county as implementation of this strategy takes place. Throughout the engagement processes employed, key messages and aims linked to these co-benefits were determined:

- develop a vision of people and nature thriving together in Norfolk
- acceptance that on some sites, nature needs to come first
- ensure that everyone has access to green and natural space
- co-create nature recovery actions with local communities to maximise engagement
- provide support for schools, community groups and other appropriate landowners to develop connections and take action on their own estates.

Potential Benefits

For each of the key habitat areas identified within this strategy, the co-benefits that could result from the priority measures identified are summarised below. The actual benefits delivered will depend on a range of factors including the type of action, the related habitat, location and access. These factors are considered during the development and determination of the strategic opportunity areas. There are also important actions outside of the scope of the LNRS, such as reduction of emissions and pollution at source.

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Coastal

- Food production due to increased biodiversity.
- Flood protection due to managed habitat creation.
- Pollution control and improving water quality from creation of new wetland areas.
- Erosion control and climate resilience from realignment projects.
- Opportunities for recreation, exercise and supporting health and wellbeing.
- Aesthetic value and tranquility.

Farmland

- Food production; increased yield due to pollinator increase and natural pest predators.
- Pollution control and improving water quality from use of buffer strips.
- Reduced soil erosion from increased permanent vegetation planting, using cover crops, terracing, agroforestry or adopting conservation tillage techniques.
- Soil formation and protection from erosion due to planting schemes.
- Climate resilience due to increased connectivity and improved shade and shelter created by mosaics of diverse habitats.
- Opportunities for recreation, exercise and supporting health and well-being.

Woodland, trees and scrub

- Wood production due to new planting schemes and management.
- Improved air quality due to increased vegetation.
- Carbon sequestration from woodland creation and healthy soil development.
- Soil formation and protection from erosion due to planting schemes.
- Flood protection due to increased tree planting in riparian areas, buffer strips, woody debris and floodplain restoration.
- Increased soil infiltration due to increased organic matter.
- Climate resilience due to increased connectivity and improved shade and shelter created by mosaics of diverse habitats.
- Opportunities for recreation, exercise and supporting health and well-being.

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Freshwater

- Food production due to increased biodiversity.
- Increased water availability and enhanced water quality as a result of appropriate processes and reduction in pollution.
- Flood protection due to managed habitat creation and reconnection of rivers to floodplains.
- Pollution control due to reduced agricultural run-off.
- Erosion control and climate resilience from habitat creation.
- Carbon sequestration through the creation of lowland fen habitat.
- Opportunities for recreation, exercise and supporting health and wellbeing.
- Aesthetic value and tranquility.

Grassland and heathland

- Improved air quality due to increased vegetation.
- Carbon sequestration from healthy soil development.
- Soil formation and protection from erosion due to planting schemes.
- Climate resilience due to increased connectivity and improved shade and shelter created by mosaics of diverse habitats.
- Opportunities for recreation, exercise and supporting health and wellbeing.
- Aesthetic value and tranquility.

Urban and built environment

- Food production within allotments and community gardens.
- Improved air quality due to increased vegetation at sies with high levels of infrastructure.
- Noise reduction created by planting schemes.
- Carbon sequestration within existing and new urban trees.
- Vegetation creating cooling effects, providing shade and soaking up heavy rainfall, thereby reducing urban flooding.
- Opportunities for recreation, exercise and supporting health and wellbeing, targeted green space improvements in deprived areas.

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Case Study

Landscape recovery: Waveney and Little Ouse Recovery project

The Waveney and Little Ouse Recovery project is a Landscape Recovery pilot being led by Suffolk Wildlife Trust working in partnership with the Environment Agency and 16 other landowners and land managers. The project covers an area of about 1,650 acres in the Waveney and Little Ouse headwaters catchment on the Suffolk/Norfolk border.

The project is creating a way to fund large-scale efforts to restore and protect nature, using the concept of natural capital (the value of nature's resources) and ecosystem services (the benefits nature provides, like clean water, flood control, and recreation). This approach will deliver a range of benefits for wildlife and people, from opportunities to access and enjoy nature, to improving the health of the rivers and helping protect homes and businesses further down the rivers from flooding.

The project development phase is being supported and funded by Defra through the Landscape Recovery pilot programme under the Environmental Land Management Scheme (ELMS).

What have they achieved?

To date the project has:

- Assessed and measured the current state of biodiversity, soil carbon, nutrient in-puts, surface water run-off into rivers, and flood storage capacity to set natural capital baselines in the project area.
- Tested a range of ways to measure and track the benefits from different habitat and ecosystem restoration scenarios and changing the land-use.

Based on these, the project worked with landowners to develop proposed restoration and land-use changes that would deliver an estimated:

- 266,803 tonnes of CO_2 removed from the atmosphere over 50 years
- More than 5,000 Biodiversity Units
- 9,969 kg reduction in phosphorous inputs to land
- 450,948 m^3 additional flood water storage capacity
- 204,286 m^3 reduction in water run-off into local rivers

The project also developed a proposed legal framework and business model that will enable these ecosystem services to be valued, marketed, and sold to pay for their delivery.

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Waveney Valley

How do they do it?

The development phase of the project has involved extensive consultation and en-gagement with landowners (farmers) to secure buy-in for an ambitious vision for land-scape scale habitat and ecosystem restoration.

The innovative approaches being taken by the project include:

- use of natural capital and ecosystem services metrics to quantify the public bene-fits delivered by proposed habitat and ecosystem restoration and land-use change,
- developing a bespoke approach to valuing these to make their delivery attractive to landowners and competitive with other land management options without un-dermining food production,
- developing the legal and business structures to enable multiple landowners) to pool the ecosystem services (or credits) they can offer and sell them through a single legal entity.

Planned habitat and ecosystem restoration includes ‘Stage Zero’ river restoration on a section of the River Waveney just upstream of Roydon Fen nature reserve. This would see the river restored to its natural, meandering course from its current canalised chan-nel alongside the restoration of a functional floodplain and wetland habitats.

What's next?

The project is looking to move from the development phase into delivery, which will see habitat and ecosystem restoration works starting. Engaging and working with a wide range of stakeholders will be crucial to implementing the project’s vision.

In the future, the Waveney and Little Ouse Recovery project could provide a template for other projects taking an ecosystem services approach to fund landscape scale nature recovery and Nature Based Solutions.

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Part C: Norfolk's Priority Habitats, Assemblages and Species

Jackdaw perched on a Norfolk Coast Path sign near Cley.

The Norfolk LNRS is underpinned by a detailed understanding of the county's unique biodiversity and ecological needs. This section outlines how we have prioritised practical action for the habitats and species most in need of recovery. The priorities and measures identified are a guide to the recovery and enhancement of local species and habitats.

This section highlights three critical components of the LNRS: the identification of habitat priorities, the identification of key species and habitat-based species assemblages and the identification of environmental benefits through nature-based solutions. Combined, these provide a framework for targeted nature recovery actions in Norfolk, adopting a landscape-scale approach.

The types of actions which could be included as potential measures are:

- actions to create, improve, or restore habitats (expanding and/or enhancing habitat or changing management practices to better support biodiversity
- actions needed to benefit specific local species
- actions to connect habitat areas to improve the resilience of nature and enable species to move through the landscape.

Examples of potential measures include actions such as ‘controlled regeneration of open woodland using grazing techniques’ or ‘installation of nest boxes and suitable building eaves’.

The priorities and measures outlined in this section have been shaped through extensive collaboration with stakeholders, themed working groups and steering groups.

Feedback from this engagement, as well as public input, has ensured a balanced and inclusive strategy, reflecting local circumstances and stakeholder views.

Where possible, each area is linked to defined assemblages and habitats, highlighting the complex nature of ecosystems. In addition, an overall indication of where the opportunities outlined can respond to the pressures faced, as detailed in **Part A: Description of the Strategy Area**, is included.

While this section focuses on the measures and actions, the methodologies underpinning this work are detailed in **Appendix 2** to be clear how we have reached these outcomes.

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Using the measures and actions determined within the LNRS

The way in which the LNRS measures will be delivered will vary based on situation, location, funding opportunities and support available.

The measures outlined have been generated using the procedures described above, and many species and habitats are expected to be supported by these actions across Norfolk to create a developing nature recovery network. Before any planned nature recovery action, a sufficient site-specific review should be carried out to determine the suitability, with appropriate expert advice and input. This should include a range of advice eg hydrological surveys or reviews of the historic environment if applicable. This review should also consider any consents that may be required, for example from the local planning authority, relevant historic environment team, Environment Agency, Forestry Commission or Natural England.

Any individual or organisation looking to use the LNRS is invited to contact the Norfolk and Suffolk Nature Recovery Partnership for support as required.

An ecologist collecting a water sample during a hydrological survey to assess site suitability for nature recovery action.

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Habitat Priorities: More, bigger, better and more connected

Through the analysis of 301 existing stakeholder documents including strategies, policies and plans which relate to nature recovery, we started to identify potential priorities (full details in **Appendix 1** and **Appendix 2**). Alongside input from Themed Working Groups and authoritative sources, accompanied by priorities submitted in public and landowner surveys, this generated over 1700 identified possible actions linked to habitat creation or improvement.

A robust review process, again developed in a collaborative process, identified 20 habitat specific priority areas and 13 more general priority focus areas, designed to have a wide impact across a range of habitats and processes, but without a specific location. These priorities were assessed on a qualitative basis, aligning with key national targets for environmental change, to identify where multiple benefits would arise. Full details are available in **Appendix 3**.

The measures and actions identified for the habitat priority areas are designed to contribute where possible to the national objectives detailed below. It is considered that the approach taken to generate strategic opportunity areas encompasses these factors:

- restoration or creation of in excess of 500,000 hectares of wildlife-rich habitat outside of protected sites
- increasing total tree and woodland cover
- improving water quality and availability
- ensuring that everyone in England lives within 15 minutes' walk of a green or blue space
- restoration of 280,000 hectares of peatland in England
- restoration of water bodies to good ecological status
- supporting farmers to create or restore hedgerows
- managing woodlands for biodiversity, climate and sustainable forestry restoration of Sites of Special Scientific Interest to favourable condition
- ensuring climate change adaptability is included in actions and policies
- inclusion of proposals for nature-based solutions which improve flood risk management where appropriate
- reduction in the rates of introduction and establishment of invasive non-native species.

Each of the identified habitat priorities are profiled in this section (**Tables 4 – 23**), including links where possible to the habitat-based assemblages defined as part of the species prioritisation process (**Appendix 2**). Where the measure is included on the Local Habitat Map, this is stated, along with a linked code (for supporting information refer to **Part D, Locations for Action**).

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For each habitat priority, the following information is included:

- Detailed measures and actions
- Existing examples of this ambition where appropriate taken from the reviewed sources, intended to provide supporting evidence for the approaches indicated, but not considered to explain the full extent of this work.

See **Table 2** for an example, and **Table 3** for the evidence codes employed.

It is not possible to define locations for all measures, and there is potential for the measures outlined in this strategy to be delivered across various locations across the county. In addition, general habitat management techniques, and the consideration of working towards a sustainable and regenerative process, can be undertaken, as appropriate, in a variety of agricultural, horticultural, rural or urban locations. Such measures can especially link to common concerns raised during engagement, for example protection of pollinator species such as bees and butterflies.

Therefore, some measures within the habitat priorities are defined as unmapped. A notable example of this is within urban areas, where a wide range of actions and potential measures, for example wildlife friendly gardening practices, installation of green roofs, and increasing green infrastructure could contribute to the recovery of a high number of species and have significant impacts on environmental benefits.

However, due to the nature of the geographical features and data available, it is not suitable to apply mapped measures to these locations. Some habitat types and locations are incorporated into the Areas of Particular Importance for Biodiversity and therefore are covered by detailed management plans already in place and outside of the scope of the LNRS. Therefore, it is not possible to map measures specifically to those locations, unless they are designated as County Wildlife Sites, with the exception of SSSIs, are irreplaceable habitats or have no designation existing. Within the intertidal zone, measures can also be mapped to any designated APIB.

Table 2. Example of priorities and measures for habitat areas

Table XX. Priorities and Potential Measures considered to support species identified in the following assemblages(s): Scrub and Mosaic

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new scrub where feasible	Include open spaces and transitional habitats, such as scrub, in woodland management plans. [HPA32]	Mapped [PMXX]

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Table 3. Potential Measure Evidence Codes

Code	Evidence
HPA01	Anglian River Basin District, Great Yarmouth Risk Area
HPA02	Anglian Water biodiversity strategy
HPA03	Appropriate biodiversity plans
HPA04	Breckland Biodiversity Audit
HPA05	Broads biodiversity focus, strategies and nature recovery plans especially BNRS – Broads Nature Recovery Strategy
HPA06	CABA Chalk Stream Strategy
HPA07	Catchment management plans
HPA08	Catchment partnerships
HPA09	East Marine Plan
HPA10	Estates specific work
HPA11	Farm cluster priority actions plans (location)
HPA12	Green infrastructure programmes
HPA13	Internal Drainage Boards plans and priority actions (location)
HPA14	Local and Neighbourhood plans (location)
HPA15	Norfolk Shoreline Management Plans
HPA16	Norfolk biodiversity action, audit and plan priorities
HPA17	Norfolk local and neighbourhood plans (location)
HPA18	Norfolk Coast management techniques
HPA19	Norfolk Coast biodiversity audit priorities
HPA20	Norfolk Ecological Network Mapping Project
HPA21	Norfolk forest plans
HPA22	Norfolk local flood risk management Sustainable Drainage Systems (SuDS) plans
HPA23	Norfolk Minerals and Waste Plan
HPA24	River basin management plans
HPA25	River Catchment Partnerships priority actions
HPA26	RSPB prioritisation areas
HPA27	RSPB Priority Work Area
HPA28	Tailored advice and funded interventions (specifics)
HPA29	Tree and Woodland strategies

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Mixed Deciduous Woodland

Table 4. Mixed Deciduous Woodland (including ancient woodland) priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new deciduous woodland	• Plan new developments to plant the veteran trees of the future, using appropriate techniques such as pollarding and species with resilience to predicted climate change and disease, including where appropriate non-native species. To support species decisions, use Ecological Site Classification (ESC) profiles. • Use mixed woodland creation to provide opportunities for recreation and increased access, whilst reducing pressures on ancient woodland areas. • Create Heath, Grassland, and Woodland Enhancement Areas – zones where it is desirable to establish a mosaic of heathland, grassland, and woodlands. • Increase canopy cover area by the creation of new mixed and broadleaved woodlands, using a broad range of species to increase diversity and promote climate and pest/disease resilience. • Create new community woodlands using appropriate species in appropriate areas. • Wherever possible, creation should be achieved via natural regeneration processes, incorporating protection of the designated area and appropriate timeframes. This maximises local genetic diversity and reduces risk of disease.	Mapped [PM01]
Enlarge and expand existing deciduous woodland	• Enlarge areas of ancient semi-natural woodland, non-native woodlands and productive commercial forestry including Plantations on Ancient Woodland Sites (PAWS) and secondary woodlands. • Wherever possible, creation should be achieved via natural regeneration processes, incorporating protection of the designated area and appropriate timeframes. This maximises local genetic diversity and reduces risk of disease. [HPA13, Broads, Waveney and King's Lynn)]	Mapped [PM02]
Connect deciduous woodland areas	Within suitable sites, plant appropriate species to link woodland blocks and enhance commuting routes for species, especially bats. Plant a variety of features eg corridors, stepping stone areas or direct links using ESC profiles.	Mapped [PM03]

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Mixed Deciduous Woodland continued

Table 4. Mixed Deciduous Woodland priorities and potential measures continued

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Restore and enhance existing deciduous woodland	• Enhance woodland areas within the IDB drainage district through tree planting, ensuring potential conflicts with other habitats and species are avoided. • Reinstate, adapt or introduce appropriate management regimes, such as coppicing. • Ensure available management plans within woodland are being fully implemented • Improve biodiversity in woodland areas through targeted planting schemes, eg enrichment planting or management designed to encourage natural colonisation, or promoting retention of dead wood (fallen and standing). • Manage canopies to reduce understory shading. • Manage deer populations to sustainable levels to reduce browsing pressure. • Provide opportunities to open areas of woodland using selective felling to create appropriate structures. • Facilitate development of connected, shrub-rich, and structurally complex woodland understories. • Enhance ancient semi-natural woodland and restore PAWS to UK Forestry Standards for biodiversity, climate and other environmental and economic benefits by the gradual and systematic removal of conifers, whilst maintaining economic outputs where possible. • Restore and enhance ancient semi-natural woodland, non-native woodlands and productive commercial forestry, and restore planted ancient woodland in line with revised management plans. • Diversify woodlands by varying native tree species and tree ages to facilitate natural succession, creating optimal niches for species to occupy and thrive. • Support grey squirrel population management to enhance natural regeneration. • Increase the longevity of ancient and veteran trees by protecting trunks and roots (eg, from compaction) and implementing annual tree maintenance regimes, creation of root protection zones, appropriate remedial surgery, haloing, protection from livestock and nursing of seedlings or clonal cuttings. [HPA21]	Mapped [PM04] Mapped for appropriate conifer specific areas as [PM71]

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Mixed Deciduous Woodland continued

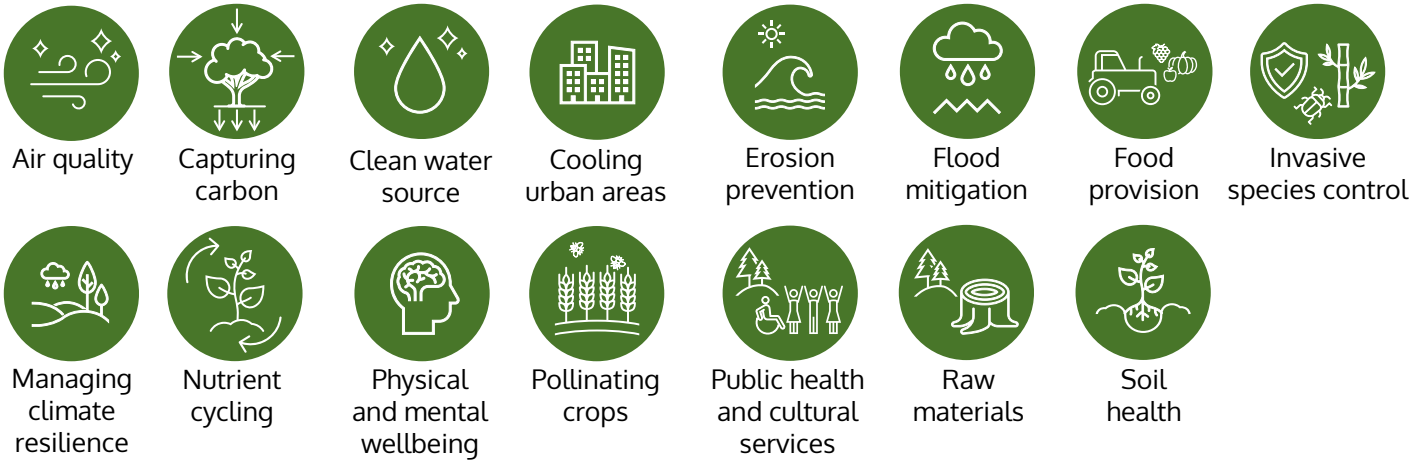
These measures are considered to support species identified in the following assemblages:

- Native Woodland

These measures could offer solutions to address pressures in:

- Woodland, Trees and Scrub
- Farmland
- Freshwater
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Wet Woodland

Table 5. Wet Woodland priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new wet woodland where feasible	• Plant appropriate species in appropriate places using ESC profiles (avoiding fen areas) along riverbanks and floodplains to reduce flood and erosion risks and create wildlife corridors, allowing natural processes to take place. • Wherever possible, creation should be achieved via natural regeneration processes.	Mapped [PM05]
Enlarge and expand existing wet woodland	See 'Create new wet woodland where feasible'	Mapped [PM06]
Connect wet woodland areas	See 'Create new wet woodland where feasible'	Mapped [PM07]
Restore and enhance existing wet woodland	• Remove inappropriate invasive or non-native species from selected sites as required eg Himalayan balsam. • Employ appropriate and effective grazing regimes and management programmes to ensure habitat conditions are maintained. • Promote the retention and conservation of significant trees and woodlands. • Improve biodiversity in wet woodland area through targeted planting schemes or natural colonisation. • Maintain wet woodland habitats by ensuring appropriate water level management based on seasonal fluctuations, soil type and location. • Maintain and enhance priority areas of fen, reed bed, grazing marsh, and wet woodland through site management agreements and support for site managers. [HPA13, (Broads, Waveney and King's Lynn), HPA03]	Mapped [PM09]

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Wet Woodland continued

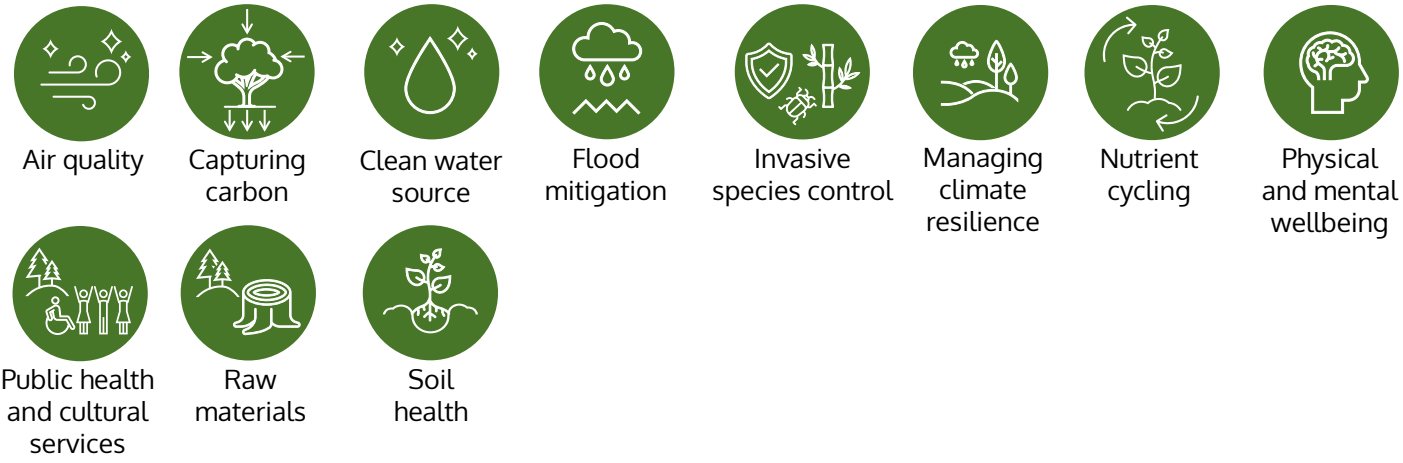
These measures are considered to support species identified in the following assemblages:

- Native Woodland
- Rivers and Riverside Habitats

These measures could offer solutions to address pressures in:

- Woodland, Trees and Scrub
- Farmland
- Freshwater
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Wood Pasture and Parkland

Table 6. Wood Pasture and Parkland priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new wood pasture where feasible	• Create wood-pasture near existing woodland to improve vegetation cover and habitat connectivity, ensuring planting follows ESC profiles. • Allow habitat connectivity where appropriate using corridors or stepping stone planting. • Increase canopy cover area by the creation of new mixed and broadleaved wood pasture using a broad range of species to increase diversity and promote climate and pest/disease resilience.	Mapped [PM09]
Enlarge and expand existing wood pasture	See 'Create new wood pasture where feasible'	Mapped [PM10]
Connect wood pasture areas	See 'Create new wood pasture where feasible'	Mapped [PM11]
Restore and enhance existing wood pasture	• Create areas to protect significant trees and woodlands in appropriate areas such as registered parks, using Tree Preservation Orders where needed if suitable. • Employ management measures for veteran and ancient trees including control of grazing pressures, reduction of compaction, protection against shade and root damage. • Incorporate mosaic features to maximise habitat value for invertebrates eg appropriate grazing animals, microhabitats such as dead wood, rot holes, ageing bark, fallen trees, leaf litter, nectar sources and ground vegetation.	Mapped [PM12]
Restore, enhance and re-create exisitng and former parkland	• Establish suitable grazing regimes and management programmes eg pollarding. • Maintain wooded parklands to preserve the landscape setting of historic estates using appropriate pruning and support as needed and considering root protection zones. • Increase the longevity of ancient and veteran trees by protecting trunks and roots (eg, from compaction) and implementing annual tree maintenance regimes. • Recreate parkland on the sites of former historic parkland.	Mapped [PM13]

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Wood Pasture and Parkland continued

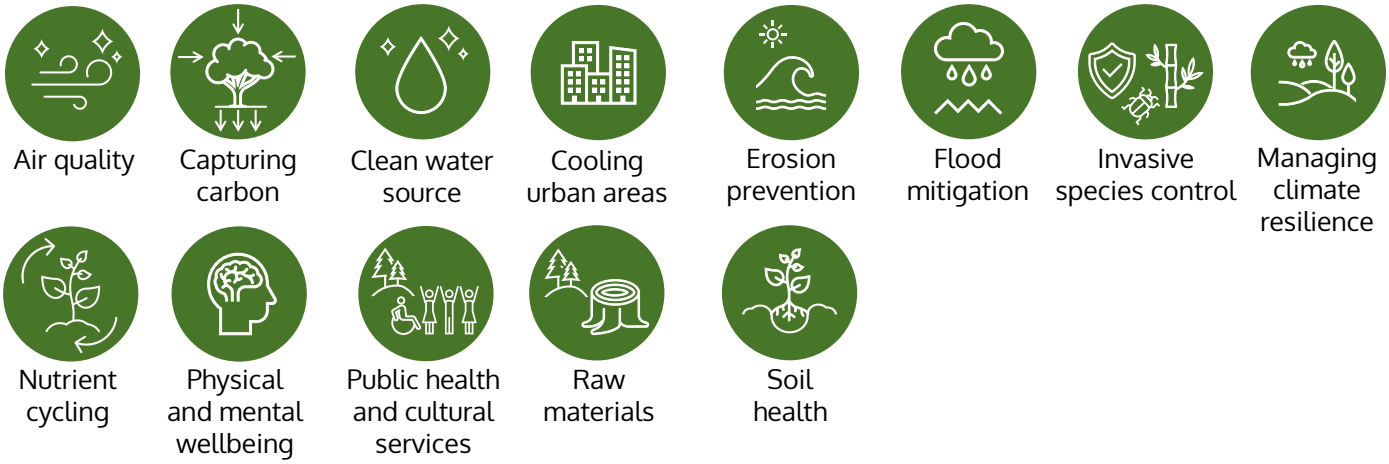
These measures are considered to support species identified in the following assemblages:

- Trees Outside of Woodlands

These measures could offer solutions to address pressures in:

- Woodland, Trees and Scrub
- Farmland
- Freshwater
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Scrub

Table 7. Scrub priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new scrub areas where feasible and desirable	Include open spaces and transitional habitats, such as scrub, in woodland management plans. [HPA26]	Mapped [PM14]
Enlarge and expand existing scrub	Use scrub areas as connectivity corridors where appropriate.	Mapped [PM15]
Connect areas of existing scrub	See 'Enlarge and expand existing scrub'	Mapped [PM16]
Restore and enhance existing scrub	• Carry out annual scrub maintenance regimes. • Adopt grazing regimes in appropriate areas to maintain scrub margins. • Coppice roadside scrub verges on long rotations (10–15 years). Ensure maintenance and management techniques are employed to retain scrub where appropriate and maintain safety aspects of location.	Mapped [PM17]

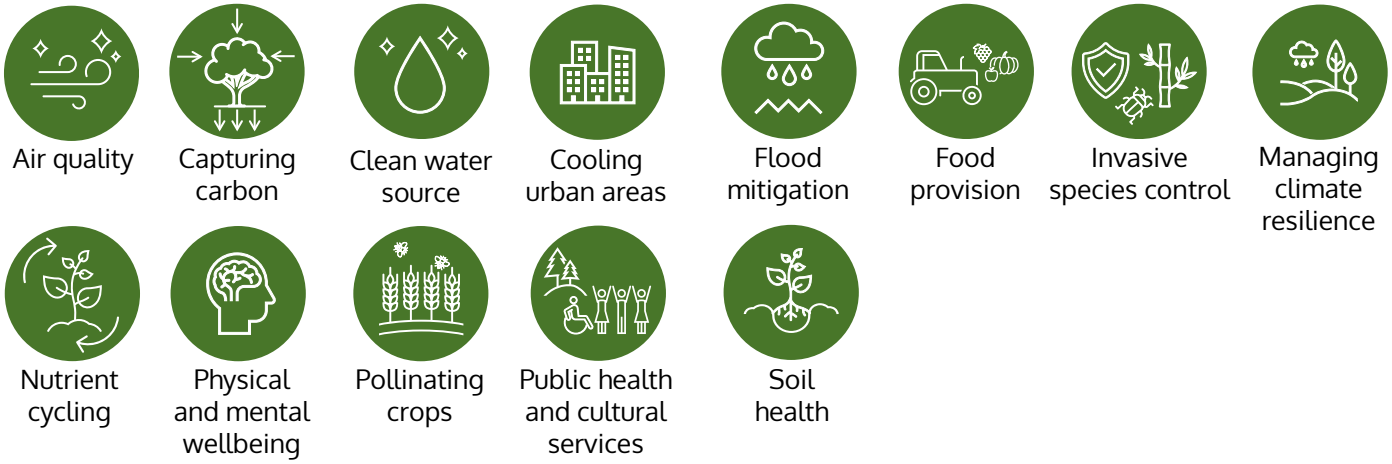
These measures are considered to support species identified in the following assemblages:

- Scrub and Mosaic

These measures could offer solutions to address pressures in:

- Woodland, Trees and Scrub
- Farmland
- Grassland and Heathland
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Habitats in Farmed Landscapes

Table 8. Habitats in Farmed Landscapes priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Enlarge and expand existing arable field margins	• Employ locally appropriate land disturbance techniques to incorporate margins. • Margins should be created to follow best practice and scheme guidance as appropriate, and to be as wide as possible within the situation. This should allow for mitigation of spray/irrigator drift and take into account edge benefits and the juxtaposition of cultivated margins. • Support identification of desirable locations for cultivated margins including light soils (chalky and acidic), especially alongside old tracks, tussocky verges, grassland areas, old hedges, pine-lines, sites of rare plants and invertebrates, and existing well-managed margins to incorporate buffering. [HPA04, HPA11 (Glaven, Wissey)]	Mapped where possible when linked to other measures [PM18]
Connect arable field margin areas	Follow principles identified above to connect existing field margins. [HPA11 (Glaven, Wissey)]	Mapped where possible when linked to other measures [PM19]
Restore and enhance existing arable field margins	Implementation of appropriate cultivation methods to maximise organic content within margins. [HPA11 (Glaven, Wissey, Wensum), HPA13 (Broads)]	Mapped where possible when linked to other measures [PM20]
Create new hedgerows using appropriate native species	• Implement regenerative farming practices. • Plant new hedgerows in appropriate areas using native species.	Mapped where possible when linked to other measures [PM21]

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Habitats in Farmed Landscapes continued

Table 8. Habitats in Farmed Landscapes priorities and potential measures continued

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Restore and enhance existing hedgerows	• Improve hedgerows and incorporate field-edge trees, encouraging gapping up and planting to enhance connectivity. • Lay or coppice hedgerows past peak maturity to encourage dense base regrowth and extend lifecycles. • Maintain hedgerows associated with Roadside Nature Reserves following appropriate plans and techniques. • Create areas which allow for retention and conservation of significant hedgerow trees. • Bring hedgerows into lifecycle management, including periodic rejuvenation. • Promote hedgerow management practices that benefit wildlife, such as incremental trimming and longer trimming rotations. • Establish species-rich hedgerows.	Mapped where possible when linked to other measures [PM22]
Establish more hedgerow trees	• Plant new hedgerow trees of appropriate varieties. • Recreate hedgerow pollards. • Increase overall canopy cover area by the creation of agroforestry crops, using a broad range of species to increase diversity and promote climate and pest/disease resilience.	Mapped where possible when linked to other measures [PM23]

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Habitats in Farmed Landscapes continued

These measures support species identified in the following assemblages:

- Farmed Landscapes
- Trees Outside of Woodlands

These measures could offer solutions to address pressures in:

- Woodland, Trees and Scrub
- Farmland
- Freshwater
- Grassland and Heathland
- Invasive Species and Diseases
- Coastal

These measures are considered to support the following co-benefits:

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Traditional Orchards

Table 9. Traditional Orchards priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new traditional orchards where feasible	• Plant orchards in rural and urban areas, including community projects. • Increase canopy cover area by the creation of new orchards using a broad range of species to increase diversity and promote climate and pest/disease resilience.	Mapped [PM24]
Enlarge and expand existing traditional orchards	Plant orchard trees annually to meet appropriate defined targets.	Mapped [PM25]
Restore or enhance existing traditional orchards	• As part of creation or regeneration processes, engage orchard owners in management, upkeep, and use, and provide education on accessing stewardship funding, training in pruning and out of management restoration. • Create areas which allow for retention and conservation of significant orchards both for cultural and landscape continuity and for the genetic diversity of fruit trees and important assemblages of epiphytes, fungi and invertebrates associated with old trees and orchards. [HPA13 (Broads)]	Mapped [PM26]

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Traditional Orchards continued

These measures are considered to support species identified in the following assemblages:

- Trees Outside of Woodlands

These measures could offer solutions to address pressures in:

- Woodland, Trees and Scrub
- Farmland
- Freshwater
- Invasive Species and Diseases
- Coastal
- Urban and Built

These measures are considered to support the following co-benefits:

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Habitats in Urban, Built and Garden Environments

Table 10. Habitats in Urban, Built and Garden Environments priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Improve the condition of the existing urban tree estate	• Ensure tree management regimes are in place to improve and enhance existing trees. • Replace all trees lost due to pests, disease, damage, or health and safety concerns. • Plant using species with resilience to predicted climate change and disease, including where appropriate non-native species, using ESC profiles. Ensure all planting schemes align with existing policies and TAWS (Trees and Woodland Strategies).	Unmapped
Increase urban tree cover	• New road developments should aim to establish diverse roadside wooded habitats, with consideration for road safety and impact of increased mammal populations. • Aim for an increase in towns and cities to 20% tree canopy cover. • Plant using species with resilience to predicted climate change and disease, including where appropriate non-native species, using ESC profiles. Ensure all planting schemes align with existing policies and TAWS (Trees and Woodland Strategies). [HPA14, HPA15]	Unmapped

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Habitats in Urban, Built and Garden Environments continued

Table 10. Habitats in Urban, Built and Garden Environments priorities and potential measures continued

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Identify focus areas for improved garden connectivity and wildlife friendly management practices	• Improve the wildlife value of private gardens and promote networks of living gardens. • Use hedges rather than fencing to divide property boundaries. • Retain hedgerows around new developments. Where access is created or widened through an existing hedgerow, replant a new native hedgerow. • Protect and enhance hedgerows in peri-urban areas. • Use mixed native hedging wherever possible, where the right species is planted in the right location. • Incorporate features in new buildings to protect and enhance wildlife, such as 'swift bricks' and 'hedgehog doors.' • Design gardens to enhance wildlife, including trees and hedgerows in boundary treatments where appropriate. • Retain ponds in the built environment. • Develop meadow areas within urban environments where possible to support pollinator species. • Include amphibian friendly features like dropped kerbs, SuDS ponds and tunnels. [HPA14, HPA15]	Unmapped
Identify areas suitable for creation of community gardens	• Develop specific community projects, such as gardens, orchards and allotments. • Retain or create native hedgerows around allotments, alongside habitats for pollinators with long flowering periods, and berry bearing shrubs for bird species.	Unmapped
Create green crossings over roads or railway lines that fragment blocks of habitat	• Increase permeability in urban and wider environments with features such as hedgehog highways, green bridges, and suitable underpasses. • Integrate green infrastructure corridors into development proposals to establish connections and ecological networks.	Unmapped
Create green crossings over roads or railway lines that fragment blocks of habitat	• Improve the management of road and rail corridors. • Follow appropriate biodiversity plans designed specifically for railway network habitats and areas.	Unmapped

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Habitats in Urban, Built and Garden Environments continued

Table 10. Habitats in Urban, Built and Garden Environments priorities and potential measures continued

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new habitats through drainage and infrastructure features on development sites	• Incorporate SuDS where appropriate, including reedbeds, green roofs, swales, rain gardens, permeable paving, water butts etc . • Plant hedgerows and trees in appropriate locations, where the right species is planted in the right location. • Add ponds to newly built environments where suitable • Incorporate habitat for pollinators, with appropriate planting and cutting regimes, rotational areas with over wintering or hibernation possibilities . • Incorporate features like green roofs, green walls and high quality varied habitats within public open spaces • Retrofit existing areas with appropriate features.	Unmapped
Make space for more, bigger, better and joined up nature in and around built development (including within new allocations and development plans)	• Develop high-quality habitats in school grounds to improve biodiversity (linking to Climate Action Plans). • Create habitats through parish-basedrecovery projects. • Enhance road verge management. • Better manage churchyards for biodiversity. • Enhance public green spaces. • Improve parks and open spaces to incorporate nature recovery techniques. • Promote the creation of 'edible parks' through community projects. • Establish Community Woodlands near settlements in appropriate conditions using appropriate species. • Plant veteran trees of the future in new developments, using appropriate native species of local provenance. • Promote the creation of urban and peri-urban agricultural opportunities. • Ensure plans for lighting infrastructure takes into account appropriate intensities, wavelengths and time patterns to minimise impact on biodiversity whilst complying with required regulations.	Unmapped

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Habitats in Urban, Built and Garden Environments continued

These measures are considered to support species identified in the following assemblages:

- Urban, Built and Garden Environments

These measures could offer solutions to address pressures in:

- Woodland, Trees and Scrub
- Freshwater
- Invasive Species and Diseases
- Urban and Built

These measures are considered to support the following co-benefits:

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Heathland and Acid Grassland

Table 11. Heathland and Acid Grassland priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new heathland areas where feasible and desirable	• Create Heath, Grassland, and Woodland Enhancement Areas to establish mosaics of heathland, grassland, and woodland habitats. • Convert landward arable fields adjacent to coastal floodplains. [HPA20, HPA13 (Broads), HPA05]	Mapped [PM27]
Enlarge and expand existing heathland	• Buffer heathland sites. • Increase connectivity between existing heathlands using creation techniques. [HPA04]	Mapped [PM28]
Restore and enhance existing heathland	• Promote management and controlled grazing regimes. • Incorporate mosaic features into habitats. • Remove encroaching vegetation where appropriate. • Protect heathland habitats and species from human disturbance. • Where possible, promote restoration of heathland from land previously used for forestry purposes.	Mapped [PM29]
Create new acid grassland where feasible and desirable	Create new acid grassland at priority sites.	Mapped [PM30]
Enlarge and expand existing acid grassland	Enlarge, buffer, and reconnect sites. [HPA20]	Mapped [PM31]
Restore and enhance existing acid grassland	• Promote management and controlled grazing regimes. • Incorporate mosaic features into habitats. • Remove encroaching vegetation where appropriate. • Maintain sites in favourable condition through appropriate management.	Mapped [PM32]

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Heathland and Acid Grassland continued

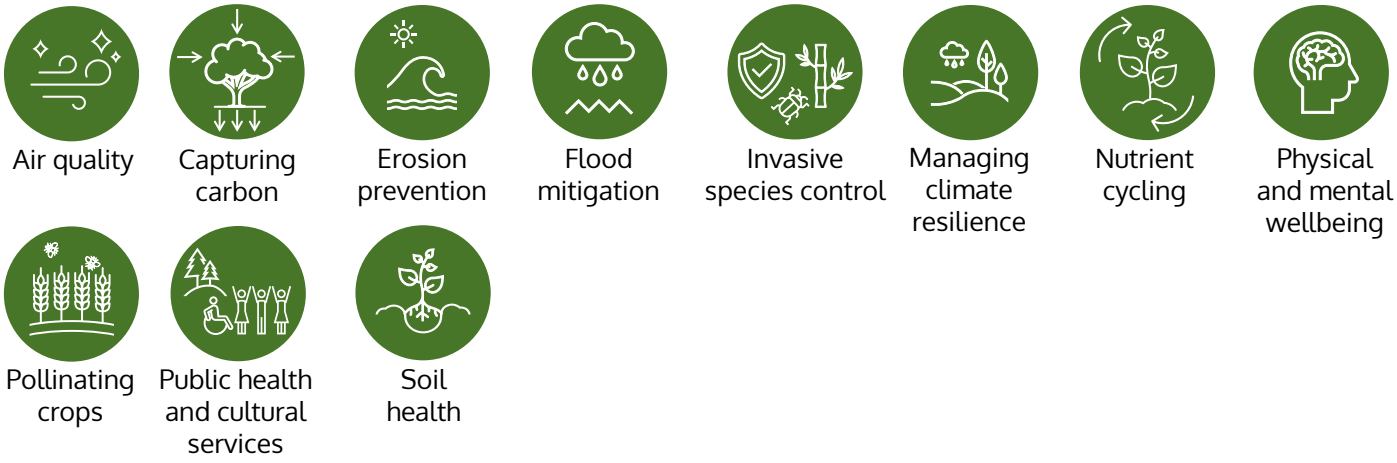
These measures are considered to support species identified in the following assemblages:

- Acid Grassland and Heathland

These measures could offer solutions to address pressures in:

- Grassland and Heathlands
- Woodland, Trees and Scrub
- Farmland
- Freshwater
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Neutral and Calcareous Grassland

Table 12. Neutral and calcareous grassland (including meadows, arable field margins, road verges, parks, churchyards and cemeteries) priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new grassland areas where feasible and desirable	• Ensure new road developments include wide verges and control new road verge provision. • Create Heath, Grassland, and Woodland Enhancement Areas to establish mosaics. [HPA20, HPA05]	Mapped [PM33]
Enlarge and expand existing grassland	Develop land management programmes for churchyards and cemeteries in all dioceses, lowland meadows and grassy commons where applicable .	Mapped [PM34]
Connect grassland areas	Connect road verge areas where feasible, potentially via agri-environment schemes.	Mapped [PM35]
Restore and enhance existing grassland	• Promote appropriate grazing and management regimes. • Incorporate mosaic features within habitats. • Maximise biodiversity-enhancing practices in churchyards and cemeteries and known lowland meadow sites. • Enlarge and restore road verges and boost biodiversity. • Buffer existing trackways and track verges.	Mapped [PM36]
Create new calcareous grassland areas where feasible and desirable	Incorporate management techniques in appropriate areas to allow natural processes to occur. [HPA11, HPA16]	Mapped [PM37]
Enlarge and expand existing calcareous grassland	See ‘Create new calcareous grassland areas where feasible and desirable’	Mapped [PM38]
Connect calcareous grassland areas	See ‘Create new calcareous grassland areas where feasible and desirable’	Mapped [PM39]
Restore and enhance existing calcareous grassland	• Re-establish lowland calcareous grassland from arable or other land. • Implement appropriate grazing regimes. [HPA11, HPA16]	Mapped [PM40]
Create new lowland meadows and pastures where feasible and desirable	• Incorporate management techniques in appropriate areas to allow natural processes to occur. • Encourage the use of green hay processes and collection of local seeds. [HPA11, HPA16]	Mapped [PM41]

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Neutral and Calcareous Grassland continued

Table 12. Neutral and calcareous grassland (including meadows, road verges, parks, churchyards and cemeteries) priorities and potential measures continued

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Enlarge and expand existing lowland meadows and pastures	Encourage the use of green hay processes and collection of local seeds. [HPA11, HPA16]	Mapped [PM42]
Connect lowland meadow and pasture areas	• Incorporate management techniques in appropriate areas to allow natural processes to occur. • Encourage the use of green hay processes and collection of local seeds. [HPA11, HPA16]	Mapped [PM43]
Restore and enhance existing lowland meadows and pastures	• Incorporate management techniques in appropriate areas to allow natural processes to occur. • Implement appropriate grazing and mowing regimes. [HPA11, HPA16]	Mapped [PM44]

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Neutral and Calcareous Grassland continued

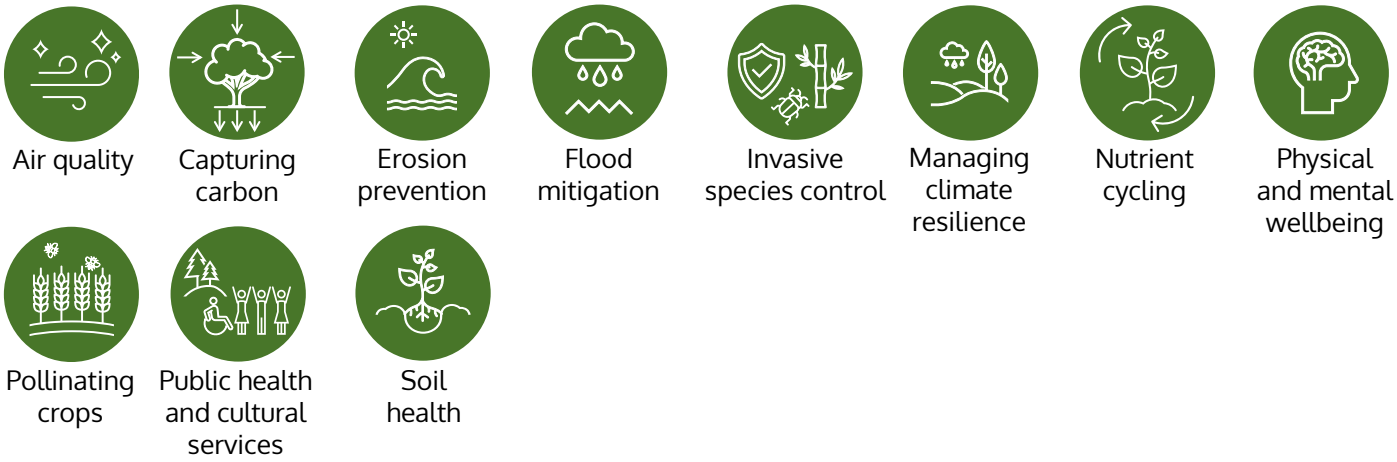
These measures are considered to support species identified in the following assemblages:

- Lowland Meadows and Pastures
- Chalk Grassland
- Brecks Grass Heath

These measures could offer solutions to address pressures in:

- Grassland and Heathlands
- Farmland
- Woodland, Trees and Scrub
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Wet Grassland

Table 13. Wet Grassland (including grazing marshes and rush pasture) priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new wet grassland and grazing marshes where feasible and desirable	• Include as part of a habitat mosaic to maximise invertebrate species, using local green hay and seeds wherever possible. • Instigate appropriate grazing and water level management regimes to benefit breeding waders and wintering wildfowl. • Connect wet grassland blocks to create larger areas of habitat. [HPA05, HPA11 (Glaven, Wensum, Wissey), HPA15, HPA02]	Mapped [PM45]
Enlarge and expand existing wet grassland and grazing marshes where feasible and desirable	See 'Create new wet grassland and grazing marshes where feasible and desirable'	Mapped [PM46]
Connect wet grassland and grazing marshes areas where feasible	See 'Create new wet grassland and grazing marshes where feasible and desirable'	Mapped [PM47]
Restore and enhance existing wet grassland and grazing marshes	• Maintain and enhance priority areas of fen, reed bed, grazing marsh, and wet woodland through site management agreements and support for site managers. • Use appropriate water level management practices, including maintaining and extending existing ditch systems. • Remove scrub and woodland where appropriate to create a variety of grazed and tall vegetation structures. • Promote appropriate grazing management regimes for breeding waders and wintering wildfowl • Minimise refuges/perches for predators next to areas utilised by breeding waders. [HPA18, HPA05, HPA11 (Glaven, Wensum, Wissey) HPA02, HPA13]	Mapped [PM48]

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Wet Grassland continued

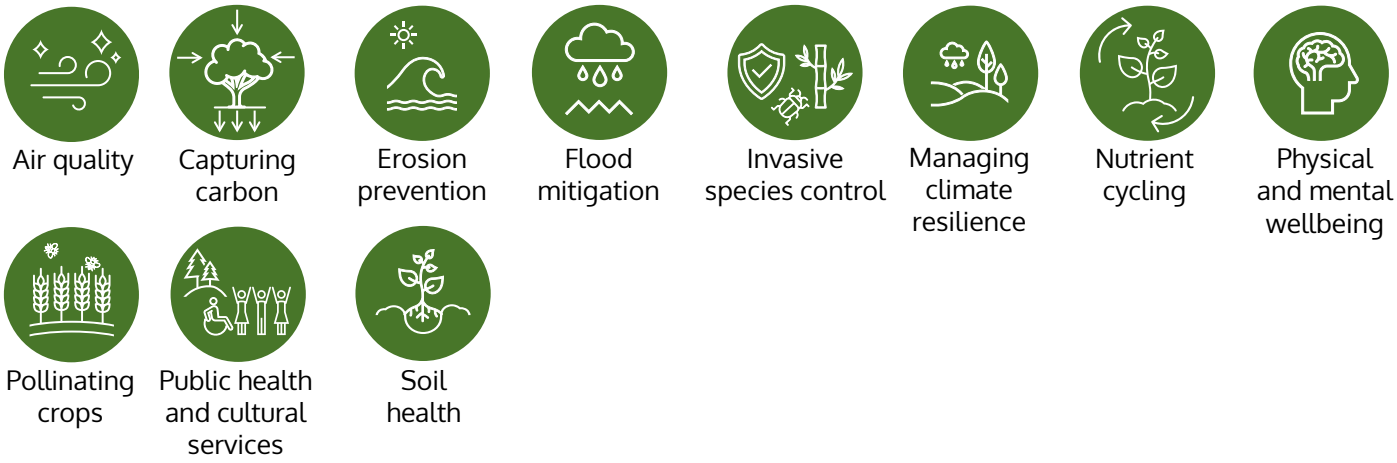
These measures are considered to support species identified in the following assemblages:

- Lowland Meadows and Pastures

These measures could offer solutions to address pressures in:

- Grassland and Heathlands
- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Open Mosaic Habitat on Previously Developed Land

Table 14. Open Mosaic Habitat on Previously Developed Land (including brownfield and landfill) priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new open mosaic habitat where feasible and desirable	• Secure the inclusion of valuable sites as recognised natural open spaces in Green Infrastructure strategies. • Develop protocols to allow land in new developments to be left for natural colonisation, ensuring ongoing opportunities for habitat creation. • Consider the potential of green and brown roofs to enhance the availability of this habitat. [HPA16]	Unmapped
Enlarge and expand existing open mosaic habitat where feasible	• Secure the inclusion of valuable sites as recognised natural open spaces in Green Infrastructure strategies. • Develop protocols to allow land in new developments to be left for natural colonisation, ensuring ongoing opportunities for habitat creation. • Ensure scrub removal, ploughing, turf removal, and the creation of steep open exposures at key former gravel workings. [HPA16, HPA04]	Unmapped
Improve and enhance existing open mosaic habitat	See 'Enlarge and expand existing open mosaic habitat where feasible'	Mapped [PM70]

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Open Mosaic Habitat on Previously Developed Land continued

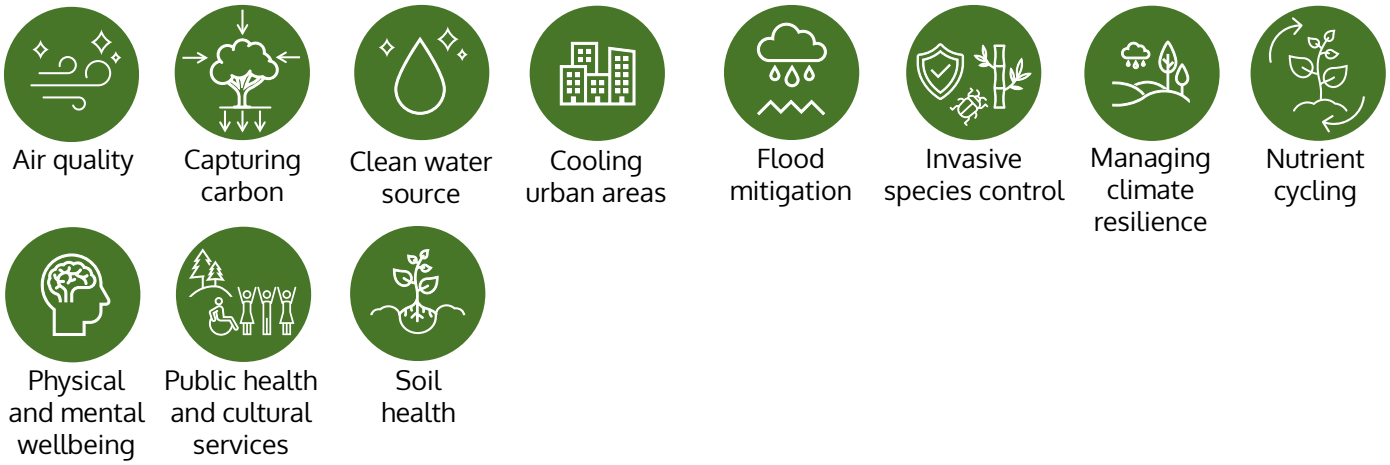
These measures are considered to support species identified in the following assemblages:

- Scrub and Mosaic
- Urban, Built and Garden Environments

These measures could offer solutions to address pressures in:

- Grassland and Heathlands
- Farmland
- Woodland, Trees and Scrub
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Rivers and Streams

Table 15. Rivers and Streams priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Restore and enhance existing rivers, streams and ditches	• Reconnect rivers with floodplains, removing barriers along the river course. • As appropriate, remove invasive and non-native species. • Improve water quality using nature-based solutions, sustainable practices and improved water treatment practices. • Allow natural river morphological processes to take place. • Use buffer strips to mitigate diffuse pollution. • Reduce erosion of river banks using appropriate planting techniques and regimes or structures. • Restore ditch and dyke habitats using appropriate species translocation, water quality testing and planned clearance to maintain water flow. [HPA05, HPA11 (Glaven, Wensum, Wissey, Water & Woodlands), HPA16, HPA17 (Breckland, Bure, Castle Acre, Wensum), HPA24, HPA07]	Mapped [PM49]
Improve management of water resources through nature-based solutions	• Mitigate against pollution, abstractions, droughts, and floods, as well as physical modifications such as land use changes, drainage, soil erosion, channelisation and barriers. • Reforestation, increasing the number of trees and vegetation biomass within the catchment. • Maintenance of soil structure and vegetation cover. [HPA01, HPA24, HPA07, HPA25, HPA13]	Mapped [PM50]
Strengthen mosaic of wetland habitats along river channels	Construction of shallow vegetated water bodies. [HPA16, HPA14 (Greater Norwich), HPA24, HPA07, HPA28 (Water Sensitive Farming, Norfolk Rivers Trust, River Waveney Trust), HPA13]	Unmapped [PM51]
Improve river, riparian and floodplain habitat	• Reinstate the natural processes of water bodies to impact on morphology and water flow and increase biodiversity. • Development of arable land on naturally wet soil into appropriate floodplain habitat to increase biodiversity. [HPA17 (Castle Acre, Wensum), HPA24, HPA07, HPA29 (Water Sensitive Farming, Norfolk Rivers Trust, River Waveney Trust), HPA13]	Unmapped [PM52]
Restore and enhance chalk stream habitats	• Restoration of river meanders. • Reconnection of the stream and the flood plain. [HPA14 (Breckland), HPA25, HPA13, HPA06]	Mapped [PM53]

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Rivers and Streams continued

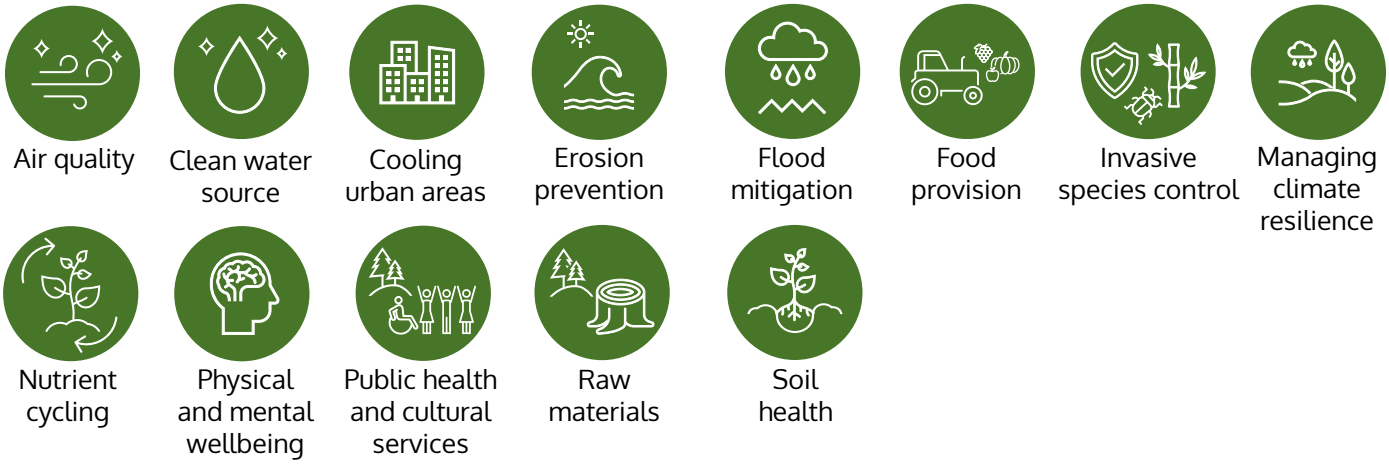
These measures are considered to support species identified in the following assemblages:

- Rivers and Riverside Habitats

These measures could offer solutions to address pressures in:

- Freshwater
- Farmland
- Woodland, Trees and Scrub
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Still Water Habitats

Table 16. Still Water Habitats priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new still water habitats where feasible and desirable	• Include ponds as integral parts of green infrastructure. • Re-establish or create ponds of high wildlife value, avoiding damage to priority habitats. New high-quality pond sites should form part of a network of clean water ponds with high biodiversity potential. [HPA14, HPA13, HPA16]	Mapped where possible [PM50 or PM69]
Restore appropriate pond habitats	• Restore ghost or lost ponds and pingos and im-prove ponds in poor condition. • Support pond restoration and creation through projects like the Norfolk Ponds Project. [HPA13, HPA28 (Norfolk Ponds Project)]	Mapped [PM54] Specific measure identified for pingo restoration [PM74]
Enhance existing pond habitats	• Control and manage invasive non-native species. • Improve water quality by reducing water and atmospheric pollution, over-abstraction, light pollution, and recreational pressures. Enhance riparian habitats, control invasive species, and implement biosecurity measures. • Clear woody vegetation from most significant pingo and mere sites, retaining some wet woodland. Maintain diverse vegetation structures around margins and within water bodies using grazing and mechanical methods. • Support community projects for pond development and maintenance. • Retain and improve the biodiversity of ponds in the built environment. • Selectively fell around ponds and pingos, connecting them via networks of rides. • Maintain some pingo sites or units without grazing or with very light grazing. • Ensure a range of vegetation structures is maintained around margins and within pingo water bodies. • Assess and reduce cover on existing overshaded ponds. [HPA04, HPA14, HPA13, HPA29]	Mapped [PM55]

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Still Water Habitats continued

Table 16. Still Water Habitats priorities and potential measures continued

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Restore, maintain and enhance lake and Broads habitats	• Control and manage invasive non-native species. • Restore diverse macrophyte communities in shallow lakes. • Trial innovative restoration techniques and identify maintenance and enhancement needs for aquatic communities. • Restore shallow lakes to a clear water state using appropriate techniques such as sediment, vegetation and fish removal. [HPA13, HPA05, HPA08, HPA11 (Glaven, Wensum, Waveney, Water & Woodlands, Wissey)]	Mapped [PM56]

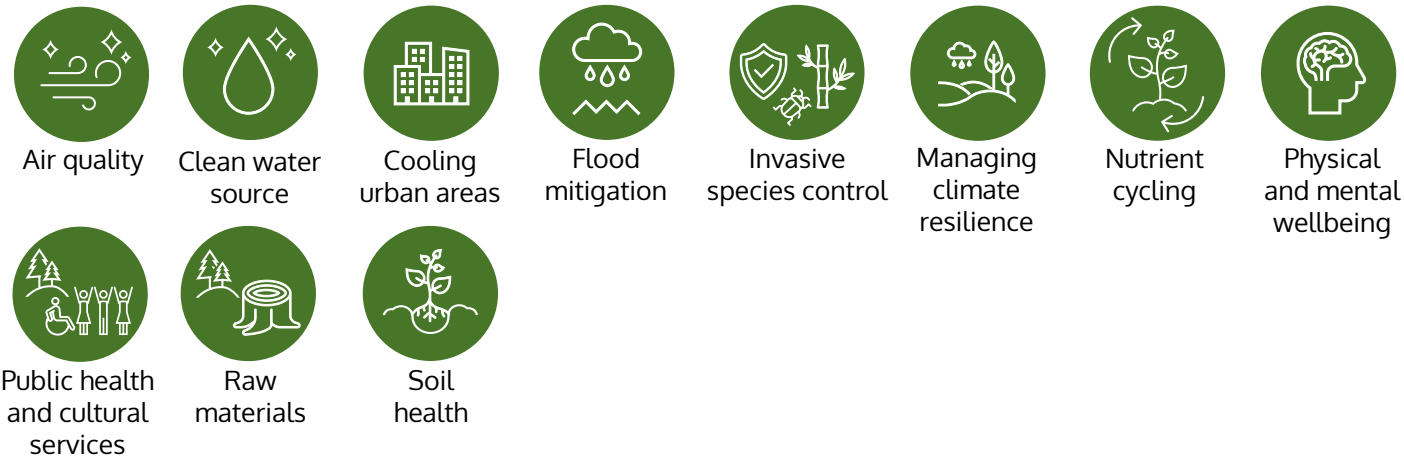
These measures are considered to support species identified in the following assemblages:

- Still Waters

These measures could offer solutions to address pressures in:

- Freshwater
- Farmland
- Woodland, Trees and Scrub
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Fen Habitats

Table 17. Fen Habitats priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new fen habitats and multi use wetlands	• Create new fen to replace those at risk from climate change impacts by identifying fen refugia areas, managing their hydrology, translocating vegetation where appropriate and re-seeding using local seed sources wherever possible • Manage the water table effectively to ensure levels are sufficient for habitat creation. [HPA23, HPA22, HPA25, HPA13]	Mapped [PM57]
Enlarge, expand and connect existing fen habitats	• Remove most scrub and woodland from fen and wetland sites, creating a mix of grazed and tall vegetation structures through flexible extensive grazing or mechanical management. Retain some wet woodland as part of the habitat. • Link fen restoration and expansion to ELMS and other projects in order to establish wildlife corridors. HPA04, HPA13, HPA11 (Glaven, Wissey), in order to establish wildlife corridors]	Mapped [PM58]
Restore and enhance existing fen habitats	• Enhance priority fen areas through site management agreements, prescriptions, and support services for site managers, in conjunction with reed bed, grazing marsh, and wet woodland control measures. • Control invasive species within wetlands. • Link fen restoration and expansion to ELMS projects. [HPA05, HPA13]	Mapped [PM59]

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Fen Habitats continued

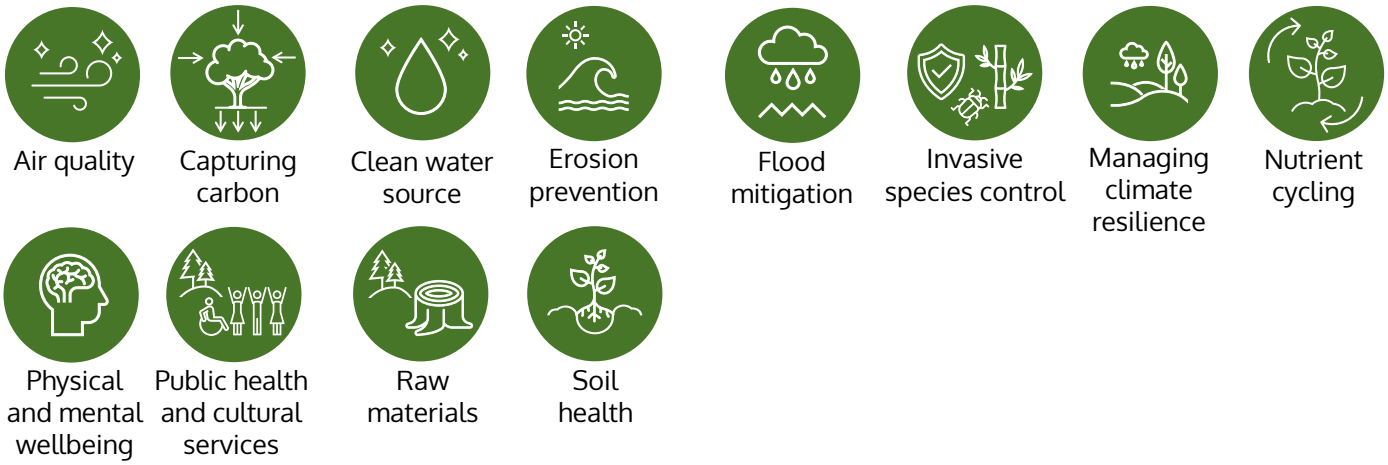
These measures are considered to support species identified in the following assemblages:

- Lowland Fen

These measures could offer solutions to address pressures in:

- Freshwater
- Farmland
- Woodland, Trees and Scrub
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Reedbeds

Table 18. Reedbeds priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new reedbed habitat	• Create new reedbeds to replace those at risk from coastal management changes. • Where appropriate, reconnect fragmented wetlands and reedbeds with existing habitats. • Explore opportunities to create new reedbeds and link them with other projects to establish wildlife corridors. [HPA16, HPA02, HPA13, HPA27]	Mapped [PM60]
Enlarge, expand and connect existing reedbed habitat	• Incorporate SuDS, including reedbeds and nat-ural filtration systems, to manage floods while creating habitats and green corridors. • Explore opportunities to create new reedbeds and link them with other projects to establish wildlife corridors. • Develop a reed management policy, maintain-ing and extending reedbed fringe habitats along Board drains where feasible. [HPA11 (Glaven, Wissey), HPA12, HPA02, HPA13, HPA27]	Mapped [PM61]
Restore and enhance existing reedbed habitat	• Restore rivers, fens, and reedbeds (peatland). • Enhance priority fen, reedbed, grazing marsh, and wet woodland areas via site management agreements, prescriptions, and support services for site managers. • Improve reedbeds through appropriate water level management and maintain reedbed fringe habitats along main drains. • Develop a reed management policy, maintaining and expanding reedbed fringe habitats along Board drains where feasible. [HPA05, HPA02, HPA13, HPA27]	Mapped [PM62]

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Reedbeds continued

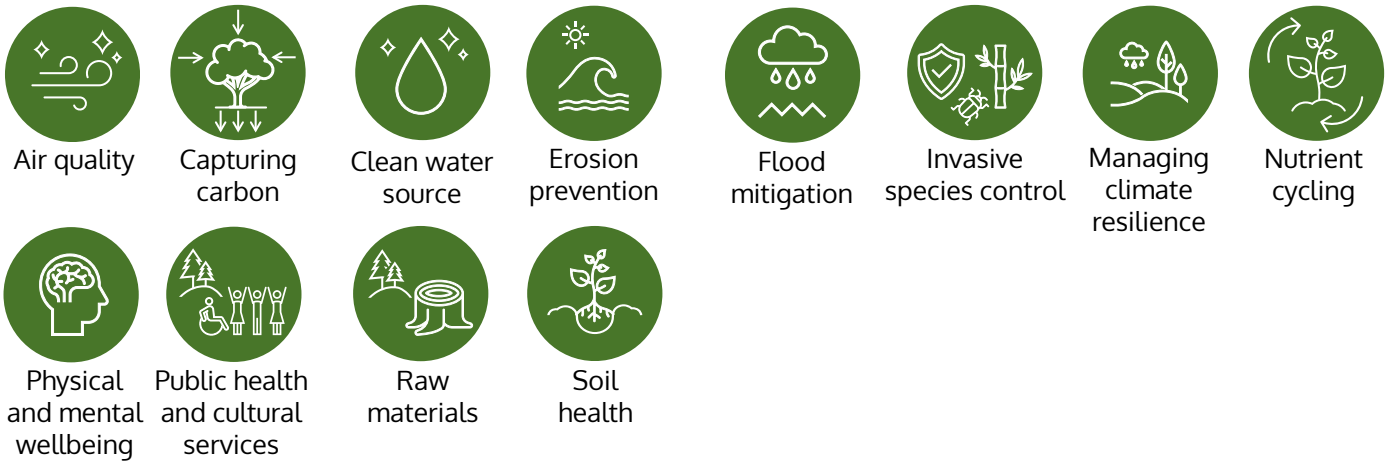
These measures are considered to support species identified in the following assemblages:

- Reedbeds
- Freshwater Wetlands

These measures could offer solutions to address pressures in:

- Freshwater
- Coastal
- Farmland
- Woodland, Trees and Scrub
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Coastal Saltmarsh and Intertidal Mudflats

Table 19. Coastal Saltmarsh and Intertidal Mudflats priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Create new saltmarsh where feasible and desirable	• Allow saltmarsh to develop naturally and migrate inland where feasible, restoring the coastal floodplain through managed realignment (eg removing or breaching artificial structures). • Actively convert grazing marsh areas at high risk of sea defence failure to saltmarsh or brackish marsh. [HPA12, HPA15, HPA13, HPA27, HPA19, HPA11 (Glaven, Wissey)]	Mapped [PM63]
Enlarge and expand existing saltmarsh	See 'Create new saltmarsh where feasible and desirable'	Mapped [PM64]
Restore and enhance existing saltmarsh	• Allow saltmarsh to develop naturally and migrate inland where feasible, restoring the coastal floodplain through managed realignment (eg removing or breaching artificial structures). • Improve saltmarsh management in areas outside SAC, SSSI, and Ramsar designations using appropriate methods such as grazing management, vegetation planting, management of pollution events, management of access, freshwater input and drainage. Refer to appropriate documentation where possible Saltmarsh management manual - GOV.UK [23]. • Mitigate impacts from recreational disturbance, linking to strategic solutions where appropriate. [HPA09, HPA12, HPA15, HPA13, HPA27, HPA11 (Glaven, Wissey)]	Mapped [PM65]
Create new intertidal mudflats where feasible and desirable	Implement shoreline management strategies, including managed realignment. [HPA09, HPA15, HPA13, HPA27]	Mapped [PM66]
Enlarge and expand existing intertidal mudflats	See 'Create new intertidal mudflats where feasible and desirable'	Mapped [PM67]
Restore and enhance existing intertidal mudflats	See 'Create new intertidal mudflats where feasible and desirable'	Mapped [PM68]

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Coastal Saltmarsh and Intertidal Mudflats continued

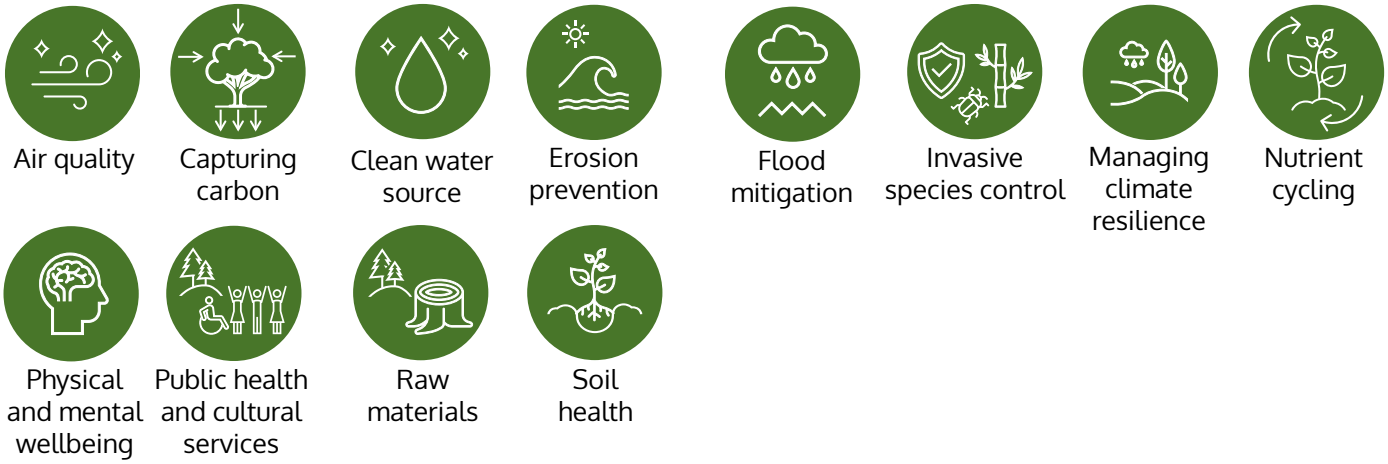
These measures are considered to support species identified in the following assemblages:

- Saltmarshes and Lagoons

These measures could offer solutions to address pressures in:

- Freshwater
- Coastal
- Farmland
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Coastal Sand Dunes

Table 20. Coastal Sand Dunes priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Facilitate the formation of new coastal sand dunes	• Allow natural coastal processes to enable dunes to develop, move, and function naturally. • Facilitate dune formation using appropriate planting eg use of marram grass. • Implement shoreline management, including managed realignment. [HPA15, HPA13 (Broads, Norfolk Rivers)]	Unmapped
Enlarge and expand existing coastal sand dunes	• Allow natural coastal processes to enable dunes to develop, move, and function naturally. • Restore dune slacks to create a succession of habitats for dune slack species, restore natural functioning to dune systems constrained by sea defences and facilitate dune roll-back. • Enhance connectivity between dune systems by improving remnant dunes and creating eco-tones with inland habitats. [HPA16]	Unmapped
Restore and enhance existing coastal sand dunes	• Allow natural coastal processes to enable existing dunes to move and function naturally, increasing their resilience. • Improve sand dune management outside designated areas (eg SAC, SSSI, Ramsar). • Use techniques detailed in published advice such as The Sand Dune Managers Handbook: second edition – Natural England [24]. • Mitigate impacts from recreational disturbance through strategic solutions. • Control invasive species. • Restore dune slacks to create a succession of habitats for dune slack species, restore natural functioning to dune systems constrained by sea defences and facilitate dune roll-back. • Enhance connectivity between dune systems by improving remnant dunes and creating ecotones with inland habitats. [HPA16, HPA15]	Unmapped

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Coastal Sand Dunes continued

These measures are considered to support species identified in the following assemblages:

- Coastal Shingle and Dunes

These measures could offer solutions to address pressures in:

- Coastal
- Freshwater
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:

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Coastal Vegetated Shingle

Table 21. Coastal Vegetated Shingle priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Facilitate the formation of new coastal vegetated shingle	• Allow natural coastal processes to enable vegetated shingle to develop, move, and function naturally. • Implement shoreline management, including managed realignment. [HPA15]	Unmapped
Enlarge and expand existing coastal vegetated shingle	Implement shoreline management, including managed realignment. [HPA15]	Unmapped
Restore and enhance existing coastal vegetated shingle	• Allow natural coastal processes to enable vegetated shingle to function naturally. • Improve vegetated shingle management outside designated areas (eg SAC, SSSI, Ramsar). Techniques include: minimising disturbance, using traditional land management techniques on adjacent grassland, preventing scrub encroachment, and leaving tidal debris, driftwood and seaweed on the beach. • Mitigate recreational disturbance impacts through strategic solutions. • Implement shoreline management, including managed realignment. [HPA15]	Unmapped

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Coastal Vegetated Shingle continued

These measures are considered to support species identified in the following assemblages:

- Coastal Shingle and Dunes

These measures could offer solutions to address pressures in:

- Coastal
- Freshwater
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:

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Maritime Cliffs and Slopes

Table 22. Maritime Cliffs and Slopes priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Facilitate the formation of appropriate maritime slopes	• Allow natural coastal processes to enable maritime cliffs and slopes to develop, move, and function naturally. • Implement shoreline management, including managed realignment. [HPA15]	Unmapped
Enlarge and expand existing maritime cliffs and slopes	See 'Facilitate the formation of appropriate maritime slopes'	Unmapped
Restore and enhance existing maritime cliffs and slopes	See 'Facilitate the formation of appropriate maritime slopes'	Unmapped

These measures are considered to support species identified in the following assemblages:

- Chalk grassland

These measures could offer solutions to address pressures in:

- Coastal
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:

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Saline Lagoons

Table 23. Saline Lagoons priorities and potential measures

Priority	Potential Measure(s) and [Evidence Code(s)]	Map Status
Facilitate the formation of new saline lagoons	• Allow natural coastal processes to enable new saline lagoons to develop and function naturally. • Create new saline lagoons in strategic locations to provide stepping stones and increase resilience to climate change impacts. • Implement shoreline management, including managed realignment. [HPA15]	Unmapped
Connect saline lagoon areas	See 'Facilitate the formation of new saline lagoons'	Unmapped
Restore and enhance existing saline lagoons	• Allow natural coastal processes to enable existing saline lagoons to function naturally. • Improve saline lagoon management in areas outside SAC, SSSI, and Ramsar designations. Techniques include: maintaining water quality levels, minimising disturbance, maintaining structural diversity, controlling encroachment and maintaining the margins • Implement shoreline management, including managed realignment. [HPA09, HPA15]	Mapped where possible [PM73]

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Saline Lagoons continued

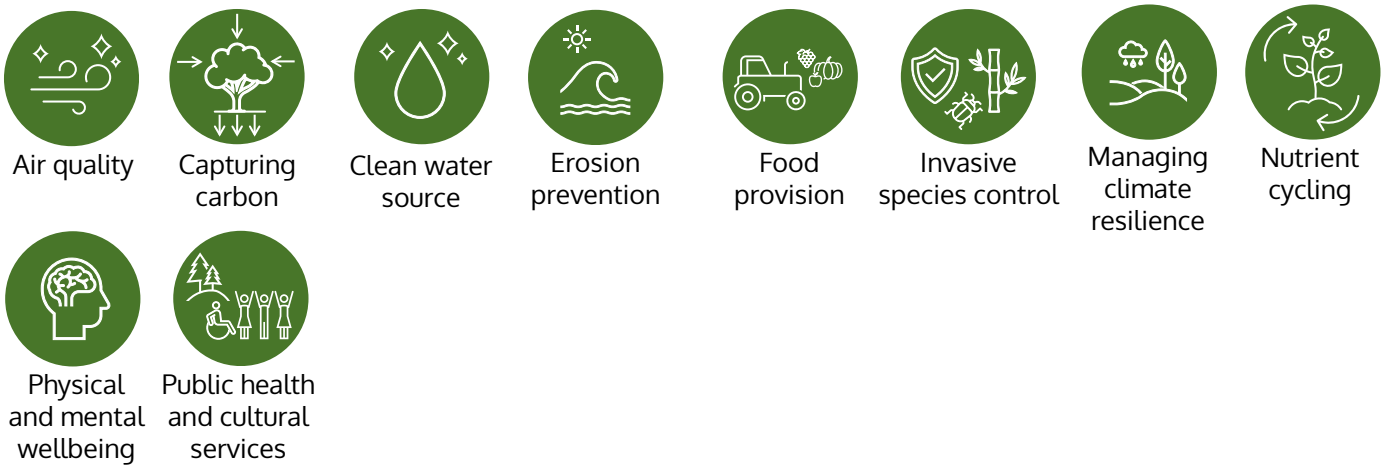
These measures are considered to support species identified in the following assemblages:

- Saltmarshes and Lagoons

These measures could offer solutions to address pressures in:

- Coastal
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Mapping potential measures to create mosaic habitats

Allowing dynamic habitat mosaics consisting of different habitat types to develop in some places is important in supporting the full diversity of habitats and species that would naturally occur in a place. This is especially important at a large scale where such mosaics can be allowed to develop under minimal human-led management, which might not be feasible to resource at such a scale or desirable in terms of habitat outcomes.

The dynamic habitat mosaic approach can instead embrace natural processes such as grazing and disturbance to shape the habitats, with the ambition to produce diverse areas with varied vegetation structure and crucial transitional zones (eg from dry to wet habitats, open to closed vegetation, bare to covered ground).

Dependent on the underlying conditions, the habitats that would naturally occur would be established to largely undetermined outcomes, allowing them to adapt and develop resilience to pressures such as climate change.

These habitats can be created on a variety of scales and would be considered to facilitate ambitious recovery projects. Where possible, they can be included within the spatially mapped opportunities within this strategy, but could also be considered part of the wider priorities and measures that could take place across the county, facilitated by all stakeholders.

Mosaics have been mapped to those parcels where multiple habitats comprising a natural succession of habitats were suggested through the rules based mapping, where the distinctiveness of those habitats (as defined for BNG purposes) is the same or similar, and where there is widespread distribution of these habitats throughout the county. These have been mapped as potential measure code PM72.

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Case Study

Reviving peatlands for wildlife and climate: Buttle Marsh restoration project

Buttle Marsh sits in a curve of the River Ant in the Broads National Park and has been managed by the Broads Authority since it was purchased in 2003. Prior to the Broads Authority taking over the site, it was used as farmland created by draining the historic marshes.

Buttle Marsh, near How Hill, was intended to create habitats for the bittern, one of the Broads' rarest and most elusive wildlife species. However, whilst Bittern occasionally visit the site, it has generally remained too dry for them to nest. The Broads Authority has been awarded £250,000 of funding to restore Buttle Marsh.

Who's involved?

Funding for the restoration comes from the Nature for Climate Peatland Grant Scheme and Anglian Water's "Get River Positive" Scheme. It follows on from an 18-month project to identify suitable locations for nature-based climate projects in and around the Broads National Park.

The whole Buttles area

Grazing ponies at Buttles Marsh

What will they acheive?

The project will install a wind powered pump to raise the water table in the 30ha marsh, restoring “peat forming” fen vegetation.

This means the marsh will once again fulfil its natural function as a carbon sink, aiding the fight against climate change. It will also create a more valuable fen habitat, making it as attractive as possible for wildlife.

How are they doing it?

Pumping will take place during winter, with water stored in an on-site reservoir to allow a continued supply of water to the marsh’ during summer. By using a reservoir, the project will avoid taking water from the river during the drier months. This will make sure that our restoration does not have a negative impact on the river.

The project works with local farmers and landowners to demonstrate how to manage water for nature across drained floodplains. Despite the habitat needing improvement, it already has species such as water voles and grass snakes. The works will protect these animals.

What's next?

Funding is being sought to continue the restoration work with farmers.

Find out more at www.broads-authority.gov.uk/looking-after/projects/buttle-marsh-restoration-project

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Prioritising species

The foundation of this work began with a thorough review of 842 species of concern across Norfolk, derived from authoritative sources such as Natural England and the National Biodiversity Network. Employing a robust scoring system, developed in collaboration with stakeholders and experts, species were assessed for their conservation status, ecological significance, and vulnerability. This systematic process reduced the longlist to 237 species, which were further defined as 25 key species for focused action, detailed in **Tables 39 - 63**, while the remaining were grouped into habitat-based assemblages **Tables 24 - 38**. All relevant species are listed in **Tables 71 - 73** and full details are available in **Appendix 2**.The key species are shown below in **Figure 10**.

Figure 10. Norfolk key species

Basil-thyme case-bearer
Coleophora tricolor

Crested buckler fern
Dryopteris cristata

Crested cow-wheat
Melampyrum cristatum

Dwarf eelgrass
Zostera noltei

Eurasian curlew
Numenius aquata

European eel
Anguilla anguilla

Fen raft spider
Dolomedes plantarius

Holly-leaved naiad
Najas marina

Intermediate stonewort
Chara intermedia

Lapwing
Vanellus vanellus

Lesser water measurer
Hydrometra stagnorum

Little whirlpool ramshorn snail
Anisus vorticulus

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Narrow-mouthed whorl snail
Vertigo angustior

Natterjack toad
Epidalea calamita

Northern pool frog
Pelophylax lessonae

One-grooved diving beetle
Bidessus unistriatus

Orange-fruited elm lichen
Caloplaca luteoalba

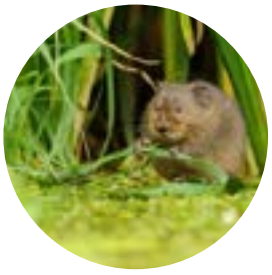
Scarce vapourer
Orgyia recens

Serotine bat
Eptesicus serotinus

Starlet sea anemone
Nematostella vectensis

Starry Breck Lichen
Buellia asterella

Suffolk lungwort
Pulmonaria obscura



Water vole
Arvicola amphibius

White-clawed crayfish
Austropotamobius pallipes

Witham orb mussel
Sphaerium solidum

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Habitat-based assemblages

Beyond individual species, the Norfolk LNRS identifies 15 habitat-based assemblages. These assemblages reflect groups of species that co-exist within specific habitat types, such as grasslands, wetlands, and urban environments. A flagship species has been selected for each assemblage to symbolise conservation efforts and engage the public. For instance, the turtle dove exemplifies farmland habitats, while the nightingale underscores the ecological importance of scrubland.

Profiles of these assemblages provide an overview of their flagship species, appropriate conservation measures, relevant habitats, and the additional biodiversity benefits they offer (**Tables 24 - 38**). By linking species and habitats, this approach ensures that measures support broader ecological networks, adhering to Lawton's principles of "bigger, better, more, and more joined up." It is recognised that not all measures are appropriate for the location of each individual species within the assemblages identified, due to varying ecological needs. It is also recognised that species included within a particular assemblage will make use of other habitat areas and ecosystem features, and are therefore not isolated to the habitat assigned but can benefit from a range of potential measures. Therefore, species specific requirements must be considered carefully as part of any planned action and expert advice obtained.

The measures and actions identified for the assemblages and species are designed to contribute where possible to the national objectives detailed below.

It is considered that the approach taken to generate strategic opportunity areas encompasses these factors:

- halt the decline of species abundance
- reduce the risk of species' extinction
- reducing the rates of introduction and establishment of invasive non-native species.

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Coastal Shingle and Dunes

Saltmarshes and Lagoons

Reedbeds and Freshwater Wetlands

Farmland Landscapes

Lowland Meadows and Pastures

Native Woodland

Trees Outside of Woodland

Scrub and Mosaic

Still Waters

Rivers and Riverside Habitats

Lowland Fen

Chalk Grassland

Brecks Grass Heath

Acid Grassland and Heathland

Urban, Built and Garden Environments

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Coastal Shingle and Dunes

Coastal habitats, such as shingle beaches and dune structures, support specialised species adapted to harsh conditions. These natural systems protect against erosion and flooding and provide essential nesting grounds for seabirds.

Little tern
Sternula albifrons

Table 24a. Coastal Shingle and Dunes assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Little tern *Sternula* albifrons	Implement intensive protective management for major colo-nies and provide suitable habitat areas.

Table 24b. Coastal Shingle and Dunes assemblage shortlisted species showing recovery potential

Species	Potential Measures
Arctic tern	As above.
Grey Hair-grass	Conduct rotavation and grazing of dunes to mobilise sand and shift accessible areas on dunes receiving a lot of recreational pressure.
Rhysodromus fallax spider	Where possible, reduce recreational pressures by incorporating accessible areas within appropriate habitats.
Prickly saltwort	See *Rhysodromus fallax* spider
Baryphyma maritimum spider	See *Rhysodromus fallax* spider
Clubiona frisia spider	See *Rhysodromus fallax* spider
Ringed plover	Where possible, reduce recreational pressures by incorporating accessible areas within appropriate habitats., reduce predation via protective measures, and create new habitat nesting areas on bare shingle and sand.
Slender hare's-ear	Maintain seawalls, banks, and ditch sides to support habitat health.
String of sausages lichen	Where possible, manage recreational pressures by incorporat-ing accessible areas within appropriate habitats. on dunes to protect sensitive areas.
Yellow vetch '*Vicea lutea*'	Manage scrub edges within habitats to maintain ecological balance.
Wilson's pottia	Improve and protect habitats, with appropriate monitoring to enhance understanding of species requirements.

Coastal Shingle and Dunes continued

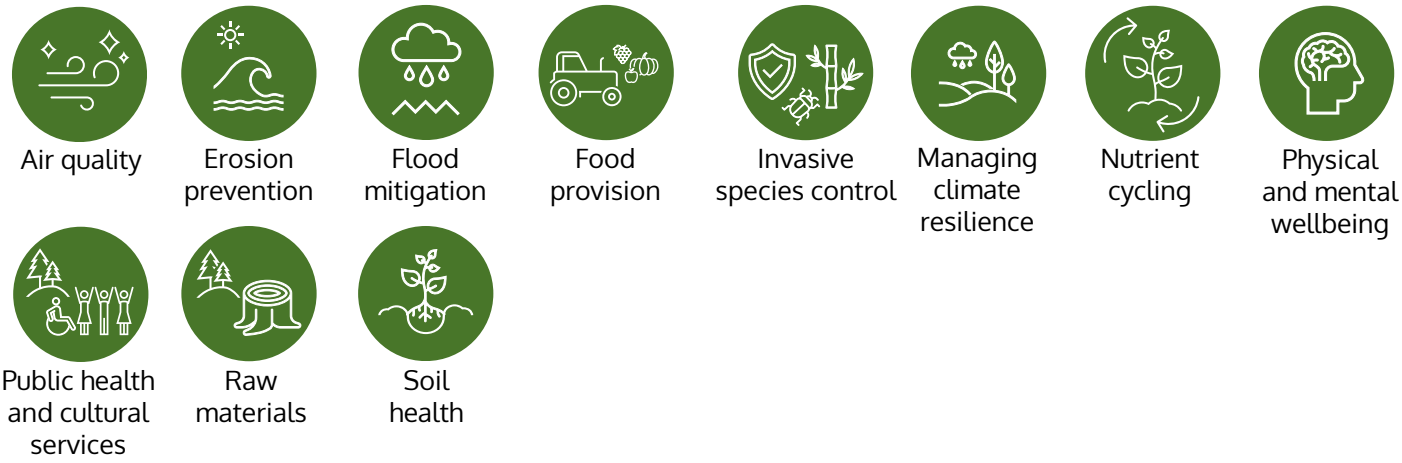
Additional species or groups benefiting from conservation actions:

- Other lichens and fungi

The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes (PM14 - 17). As well as in the existing areas of particular importance for biodiversity (APIB) where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Coastal
- Freshwater
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Saltmarshes and Lagoons

Saltmarshes, lagoons and brackish coastal areas provide essential feeding grounds for wading birds and breeding sites for fish. These intertidal habitats protect against erosion, sequester carbon, and support salt-tolerant plant life, adding significant ecological value.

Redshank
Tringa totanus

Table 25a. Saltmarshes and Lagoons assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Redshank *Tringa totanus*	• Restore habitats by manipulating water levels, reducing grazing, and delaying mowing. • Create and maintain high-quality areas of extensive, shallow, vegetated water during breeding months. • Consider seasonal grazing to create an optimal sward where appropriate • Avoid agricultural or high-disturbance activities at breeding sites during the breeding season.

Table 25b. Saltmarshes and Lagoons assemblage shortlisted species showing recovery potential

Species	Potential Measures
Oystercatcher	Maintain and restore saltmarsh habitats, managing appropriate water levels and grazing intensity.
Common tern	Create habitats using gravel pits, tern rafts in reservoirs, islets in industrial lagoons, port structures, and by improving reserves through vegetation control, managing gull competition, and predator control.
Sea barley	• Enhance management and design of coastal defence areas and retreat plans. • Cultivate the species off-site and re-introduce the plants to areas with a suitable habitat'
Small cord-grass	See Sea barley
Divided sedge	See Sea barley
Borrers saltmarsh-grass	See Sea barley
Pedunculate sea-purslane	Establish new populations as backups to the existing site in Essex; restore upper saltmarsh habitats in suitable East Anglian sites, restore the saltmarsh/dune interface where appropriate, and translocate seed specimens as needed.

Saltmarshes and Lagoons continued

Table 25b. Saltmarshes and Lagoons assemblage shortlisted species showing recovery potential continued

Species	Potential Measures
Scarce pug	Improve and enhance saltmarsh habitats to include Sea Wormwood plants.
Common eelgrass	Implement terrestrial habitat measures to improve the quality of water entering the coast, and enhance planning to reduce impacts from freshwater inputs and terrestrial run-off.
Native oyster	See Common eelgrass

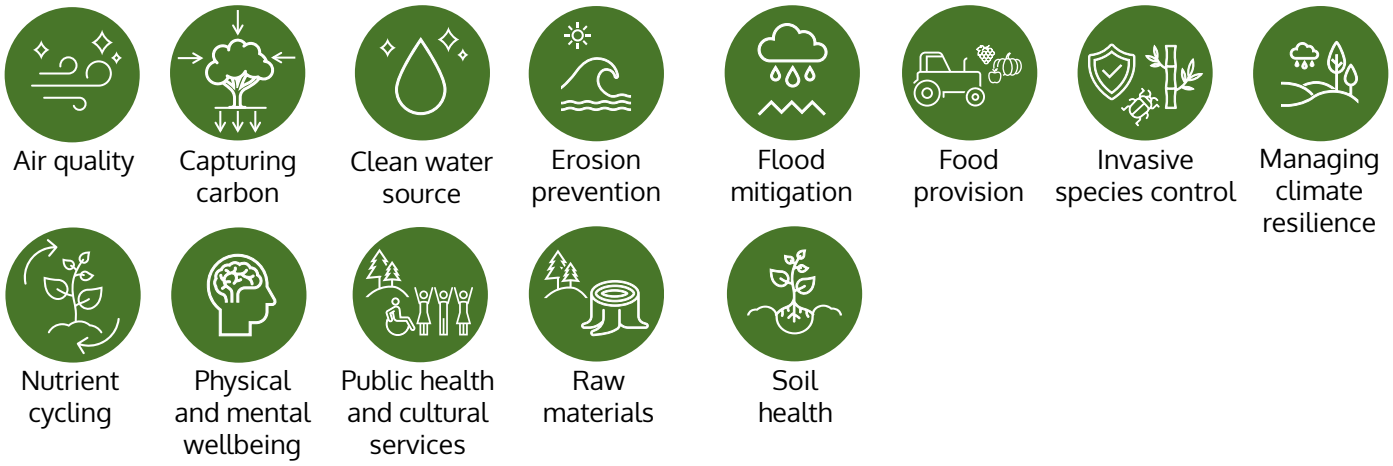
Additional species or groups benefiting from conservation actions:

- Bryophytes
- Pink-footed and Dark-bellied brent goose

The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes (PM63 - 68). As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

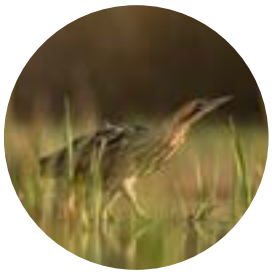
- Coastal
- Freshwater
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



Reedbeds and Freshwater Wetlands

Reedbeds, marshes, pastures, and wetlands support species like bitterns and marsh harriers, improve water quality, and aid flood management.



Bittern
Botaurus stellaris

Table 26a. Reedbeds and Freshwater Wetlands assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Bittern *Botaurus stellaris*	• Create large contiguous reedbed expanses (over 1 hectare) with restoration and protection of flooded channels. • Raise water tables in areas where reedbeds are at risk of drying out and manage reed structure to enhance diversity. • Maintain reedbed age structure, with no more than 30% older than 7 years and less than 5% scrub cover. • Implement cyclical cutting of different reed sections and regularly remove scrub. • Reduce numbers and the pressure of deer in fen and reedbeds. • Include bittern feeding requirements in ecosystem design management.

Table 26b. Reedbeds and Freshwater Wetlands assemblage shortlisted species showing recovery potential

Species	Potential Measures
Scarce emerald damselfly	Create habitats with dense submerged and emergent vegetation within shallow pools and drainage channels.
Large mouthed valve snail	Use ditch management and vegetation control, supported by research and monitoring to understand species needs.
Geyer's whorl snail	Use ditch management and vegetation control to create specific habitat of low growing grasses and sedges.
Desmoulin's whorl snail	Use ditch management and vegetation control, alongside maintenance of hydrological conditions.
Marsh harrier	• Creation and enhancement of reedbed habitats, alongside wetland regeneration projects. • Promote sustainable farming practices and reduction in use of organochlorine pesticides alongside other accumulating chemicals.
Erioptera bivittata fly	Improve and protect habitats with ecological research and monitoring to enhance understanding of specific species requirements
Robertus insignis spider	See Erioptera bivittata fly
Macrosteles oshanini spittle bug	See Erioptera bivittata fly

Reedbeds and Freshwater Wetlands continued

Table 26b. Reedbeds and Freshwater Wetlands assemblage shortlisted species showing recovery potential continued

Species	Potential Measures
Metalimnus formosus spittle bug	See Erioptera bivittata fly
Fenn's wainscot	Regularly cut reedbeds as part of habitat management.
Grass-poly	Employ ditch management and vegetation control to create exposed areas and open vegetation.
Grass snake	Develop and connect habitat areas to increase ecological connectivity.
Creeping marshwort	Create suitable habitats, such as creating scrapes in floodplains and enhancing connectivity with rivers, in appropriate areas to support species needs.

Reedbeds and Freshwater Wetlands continued

Additional species or groups benefiting from conservation actions:

- Other bat species
- Aquatic macrophytes
- Aquatic beetles

The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

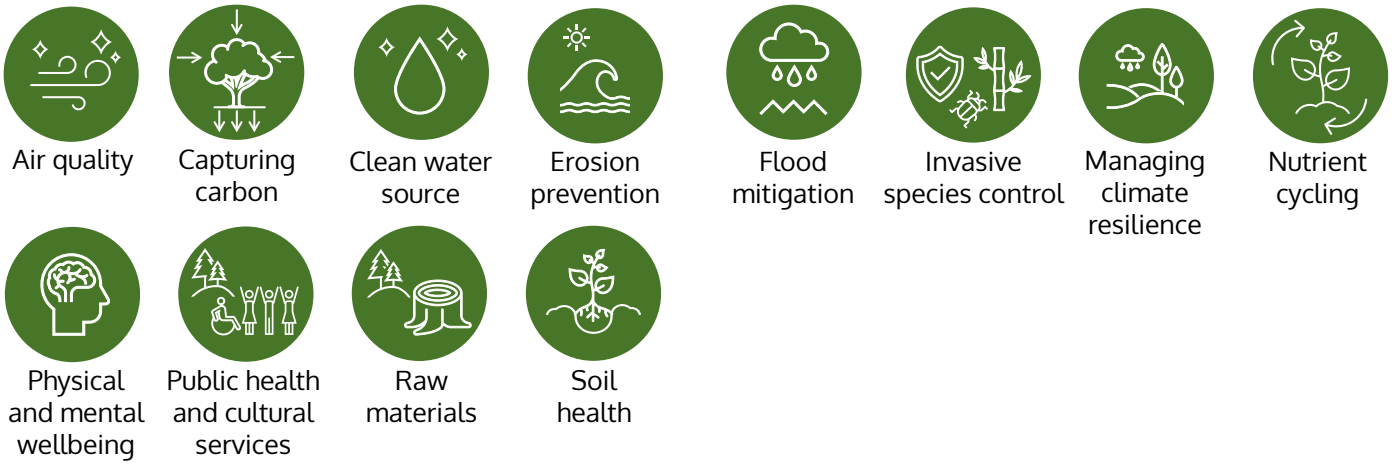
- PM41 - 52
- PM60 - 62

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations.

These measures could offer solutions to address pressures in:

- Coastal
- Farmland
- Freshwater
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Farmed Landscapes

Norfolk's farmland, including arable fields, grasslands, hedgerows, and margins, can support biodiversity with wildlife-friendly management, providing habitats for pollinators, birds, and small mammals alongside agriculture.

Turtle dove
Streptopelia turtur

Table 27a. Farmed Landscapes assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Turtle dove *Streptopelia turtur*	• Provide a variety of required habitats: ○ Nesting habitat (hedgerows, regenerating scrub and some woodland edges) ○ Foraging habitat (with bare ground/short vegetation and sources of small seeds in the breeding season) ○ Water sources with shallow edges • Manage hedges to offer nesting sites while allowing scrub areas to regenerate.

Table 27b. Farmed Landscapes assemblage shortlisted species showing recovery potential

Species	Potential Measures
Kestrel	• Increase invertebrate presence on farmland by maintaining diverse habitats and leaving wild, unfarmed areas. • Practice organic grazing and regenerative farming with reduced chemicals, especially insecticides, to support insect-eating birds. • Reduce or delay post-harvest ploughing to increase winter stubble and green cover crops, and avoid annual hedge cutting. • On intensive arable land, maintain cropped areas for nesting and foraging, adding wildflower, grass, and nectar-rich margins to boost insects and provide summer food for breeding birds. • Provide seed sources to support farmland birds, especially in late winter, either by direct provision or allowing plants to go to seed in suitable areas.
Yellow wagtail	See Kestrel
Cuckoo	See Kestrel
Skylark	See Kestrel
Tree sparrow	See Kestrel
Linnet	See Kestrel
Greenfinch	See Kestrel
Bullfinch	See Kestrel

Farmed Landscapes continued

Table 27b. Farmed Landscapes assemblage shortlisted species showing recovery potential continued

Species	Potential Measures
Corn bunting	See Kestrel
Yellowhammer	See Kestrel
Barberry carpet	Enhance and connect the existing core areas away from arable areas.
Ground pine	Ensure appropriate management of arable field margins, habitat improvement, and protection.
Broad fruit corn-salad	See Ground Pine
Small flowered catchfly	See Ground Pine
Red Tipped Cudweed	See Ground Pine

Additional species or groups benefiting from conservation actions:

- Hedgerow butterflies
- Hedgerow trees eg Hazel, Hawthorn
- Pink-footed goose

The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

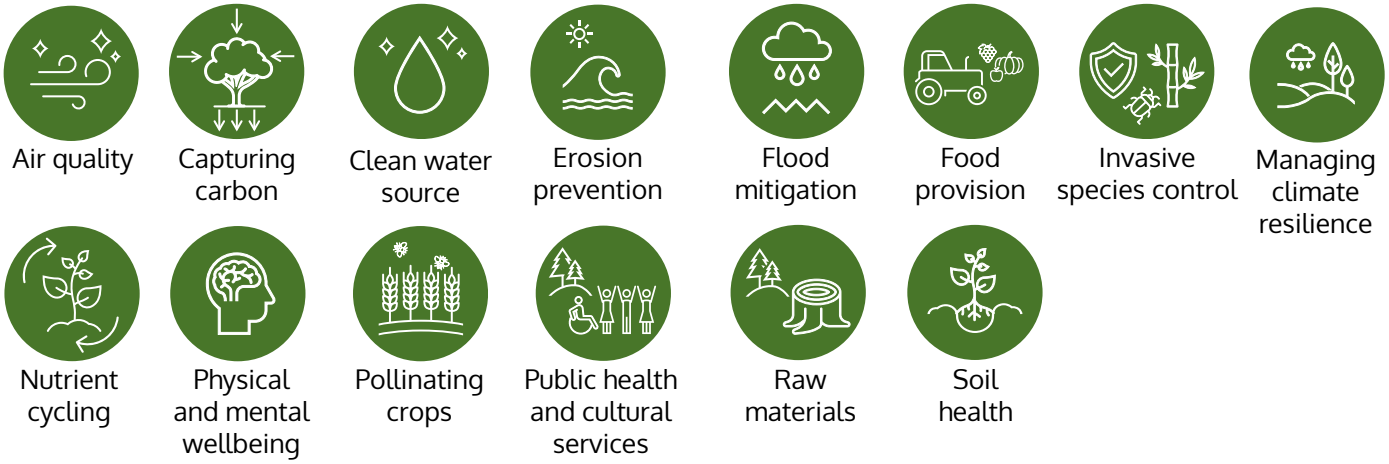
- PM1 - 4
- PM14 - 23
- PM27 - 29
- PM33 - 36
- PM45 - 48
- PM54 - 55
- PM69

Farmed Landscapes continued

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Coastal
- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Grassland and Heathlands
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



Lowland Meadows and Pastures

Species-rich grasslands, like lowland meadows and pastures, support pollinators, ground-nesting birds, and small mammals. Traditional management aids carbon storage, soil health, and water management, sustaining ecological balance.

Green-winged orchid
Anacamptis morio

Table 28a. Lowland Meadows and Pastures assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Green-winged orchid *Anacamptis morio*	• Improve management of roadside verges and other suitable locations, such as golf courses, graveyards, brownfield sites, railway lines, quarries, commons, and sports fields by cutting and raking to reduce nutrient loading followed by adopting a suitable mowing regime'. • Control invasive species to protect native biodiversity. • Manage grazing pressures to prevent overgrazing in meadow habitats. • Support pollinator populations by providing nesting sites, reducing pesticide use, and planting native flowering plants. • Avoid mowing during peak fruiting or flowering periods and control vegetation that competes with target species. Incorporate appropriate hay cutting regimes. • Increase populations of target species by creating new habitat areas adjacent to existing populations. • Control deer to sustainable levels, remove grazing animals, limit scrub and bramble encroachment, and consider fencing to protect vulnerable populations. • Re-establish specimen plants on appropriate lost sites.

Table 28b. Lowland Meadows and Pastures assemblage shortlisted species showing recovery potential

Species	Potential Measures
Dingy skipper	• As above, incorporating appropriate management and trials for species re-establishment as needed. • Appropriate hay management and/or grazing.
Yarrow broomrape	See Dingy Skipper
Spiny restharrow	See Dingy Skipper
Twayblade	See Dingy Skipper
Deptford pink	See Dingy Skipper
Sulphur clover	See Dingy Skipper

Lowland Meadows and Pastures continued

Table 28b. Lowland Meadows and Pastures assemblage shortlisted species showing recovery potential continued

Species	Potential Measures
Frog orchid	See Dingy Skipper
Chamomile	See Dingy Skipper

Table 28c. Lowland Meadows and Pastures assemblage additional species or groups benefiting from conservation actions

Species	Potential Measures
Fungi	• Ensure the long-term continuity of suitable tree species in these locations, from saplings to veteran trees, through planting or encouraging natural regeneration. • In hotspot areas, protect soils by avoiding tree felling or coppicing, and avoid using fires, fertilisers, or heavy machinery.

Lowland Meadows and Pastures continued

Additional species or groups benefiting from conservation actions:

- Barn owl
- Bryophytes

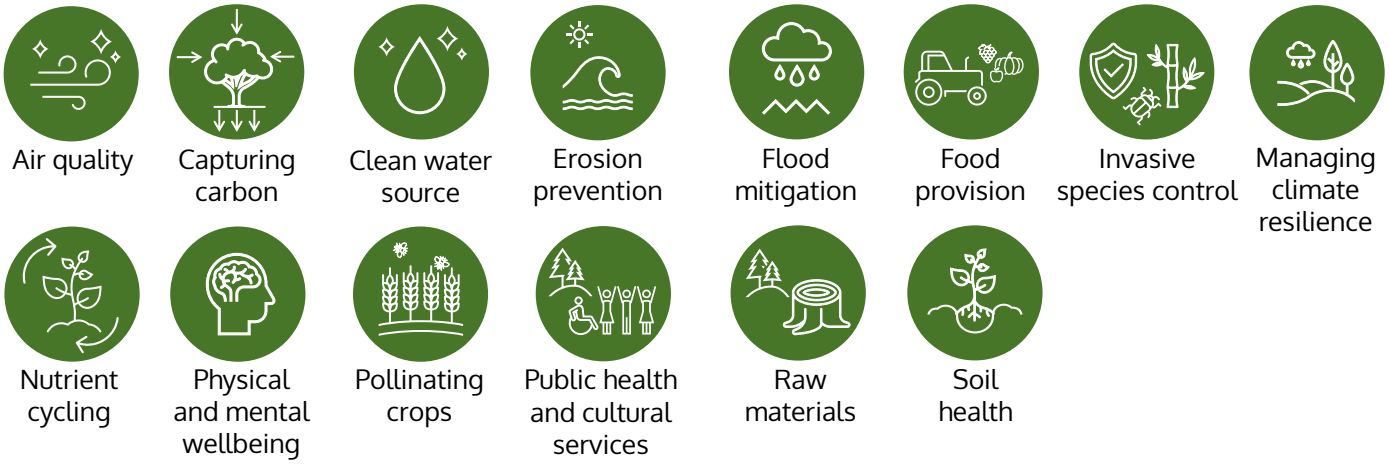
The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

- PM33 - 36
- PM41 - 44

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Grassland and Heathlands
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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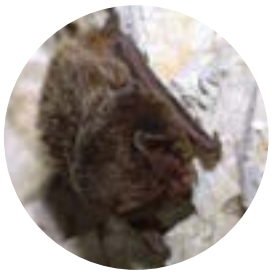
Native Woodland

Norfolk's native woodlands, with ancient and veteran trees, are rich ecosystems that support diverse wildlife, store carbon, purify air, and mitigate floods, bolstering climate resilience and enhancing the landscape.



Barbastelle bat
Barbastella barbastellus

Table 29a. Native Woodland assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Barbastelle bat *Barbastella barbastellus*	• Use woodland management practices to enhance appropriate woodland areas, such as streams and ponds within wet woodland. • Create roosting locations with mixed habitat features such as dead trees and dense woodlands near open areas. • Establish foraging corridors by planting trees and hedgerows within 6 km of suitable roosting habitats. • Near bat roosts, plant trees or woodland that can develop veteran features like hollowing. • Protect maternity roosts and hibernacula from development • Create connections between populations to reduce isolation.

Table 29b. Native Woodland assemblage shortlisted species showing recovery potential

Species	Potential Measures
Eagle's claw lichen	• Maintain host tree species (eg Acer, Fraxinus, Ulmus, Quercus) in wood pasture, parkland, and along roadsides. • Thin trees selectively to reduce overstocking in order to maintain appropriate light to the lichens and add structural variety in woodlands, ensuring successional natural processes can occur. • Control regeneration to keep woodlands open, potentially by reintroducing grazing, mindful of wild herbivore pressure. • Clear dense growth around veteran trees, aiming for glades across one-third of the area with varied age and size.
Wadeana minuta lichen	See Eagle's claw lichen
Drab wood soldierfly	• Restore and maintain mature woodlands with an extensive understorey layer, including veteran oaks, deadwood (fallen or standing), and appropriate clearings and rides with shrubby edges. • Manage deer populations to sustainable levels to preserve structural diversity and understorey vegetation. • Restore woodland connectivity to support ecosystem health and species movement. • Use rotational cutting of the understorey to encourage regrowth and structural diversity.

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Native Woodland continued

Table 29b. Native Woodland assemblage shortlisted species showing recovery potential continued

Species	Potential Measures
Lesser spotted woodpecker	See Drab wood soldierfly
Willow tit	See Drab wood soldierfly
Oak polypore	See Drab wood soldierfly
Marsh tit	See Drab wood soldierfly
Redpoll	See Drab wood soldierfly
Hawfinch	See Drab wood soldierfly
Dark crimson underwing	See Drab wood soldierfly
Greater butterfly-orchid	See Drab wood soldierfly
Spotted flycatcher	See Drab wood soldierfly
Purple emperor	• Establish large blocks broadleaved woodlands or clusters of smaller woods with abundant willow. • Manage woodlands for shaded conditions, promoting honeysuckle in sheltered areas. • Enhance rides and glades with bare ground and large bramble patches for nectar. • Use coppicing on 12–30-year rotations, retaining honeysuckle-supporting trees. • Control grazing to support coppice regrowth and connect open woodland areas.
Wild service tree	• Identify and include key species within planting strategies to support biodiversity and habitat goals. • Use local wild sourced seed to preserve and foster local genetic diversity’
Small leaved lime	See Wild service tree

Native Woodland continued

Table 29b. Native Woodland assemblage shortlisted species showing recovery potential continued

Species	Potential Measures
Other lichens and fungi	• Thin trees selectively for structural variety within woodlands. • Maintain open woodland structure by controlling regeneration, reintroducing grazing where appropriate, considering grazing pressure from wild herbivores. • Clear regrowth around veteran trees, creating varied glades across a third of the area. • Retain trees beneficial to valuable plant and fungi species. • Expand suitable tree areas near existing populations to boost species presence. • Manage deer populations to sustainable levels, remove grazing animals, limit scrub/bramble spread, and fence if needed. • Avoid mowing during peak fruiting/flowering and manage competing vegetation. • In hotspots, protect soils by avoiding felling, coppicing, fire, fertilisers, and heavy machinery. • Ensure continuity of tree species from saplings to veterans through planting or natural regeneration.

Additional species or groups benefiting from conservation actions:

- Other bat species
- Bryophytes
- Other native tree species eg Alder, Oak
- Sapproxilic beetles

The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

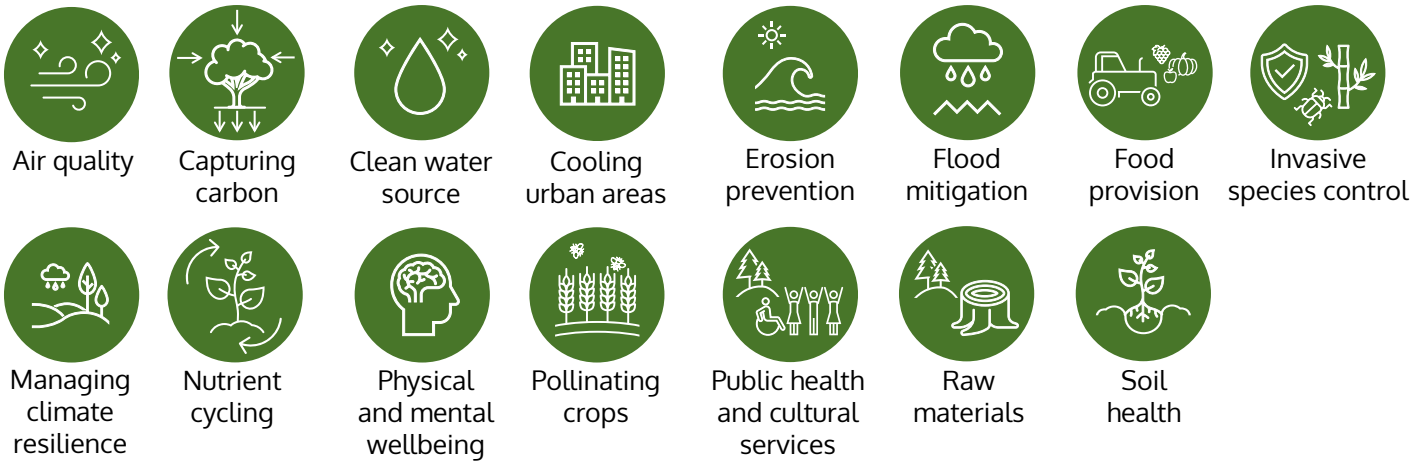
- PM1 - 4
- PM9 - 13

Native Woodland continued

As well as in the existing areas of particular importance for biodiversity (APIB) where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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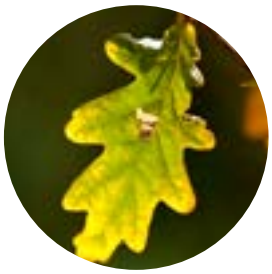
Trees Outside of Woodland

Trees in hedgerows, roadsides, and fields provide habitats, support landscape connectivity, stabilise soil, capture carbon, and enhance rural and urban character.



Pedunculate oak
Quercus robur

Table 30a. Trees Outside of Woodland assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Pedunculate oak *Quercus robur*	• Use for planting programmes in appropriate soils and within appropriate locations (use Ecological Site Classification (ESC) profiles). • Collect and cultivate seed from noteworthy specimens of Pedunculate oak in Norfolk.

Table 30b. Trees Outside of Woodland assemblage shortlisted species showing recovery potential

Species	Potential Measures
Field maple	• Use for planting programmes using species appropriate to soil type, climate and location (use Ecological Site Classification (ESC) profiles). • Collect and cultivate local origin seed in order to preserve and foster local genetic diversity.
Sweet chestnut	See Field maple
Rowan	See Field maple
Yew	See Field maple
Hornbeam	See Field maple
Black poplar	Select damp condition species for creating habitats near ditches and floodplains, linked to wetland creation. Plant specimens following genetic DNA profiling programme established via propagation and clone bank of locally sourced saplings.
Elms	• Establish habitats with species that have symbiotic relationships to support ecological diversity. • Plant native clones of Ulmus species that are disease-resistant.
White letter hairstreak	See Elms
Golden hoverfly	Maintain veteran specimens to support associated species.
Beech	See Golden hoverfly

Trees Outside of Woodland continued

Table 30c. Trees Outside of Woodland assemblage additional species or groups benefiting from conservation actions

Species	Potential Measures
Other lichens and fungi	• Thin trees selectively to reduce overstocking • Control regeneration to keep woodlands open, potentially by reintroducing grazing, considering wild herbivore pressure. • Clear dense growth around veteran trees, creating glades across one-third of the area with varied age and size. • Retain trees important for valuable plant and fungi species. • Expand suitable areas for species or plant trees near existing locations for species to boost populations. • Control deer populations, remove grazing animals, limit scrub/ bramble spread, and consider fencing if needed. • Avoid mowing during peak fruiting/flowering and control competing vegetation. • Protect soils in hotspots by avoiding use of fire, fertilisers, and heavy machinery. • Ensure continuity of suitable trees from saplings to veterans through planting or natural regeneration and appropriate management techniques.

Trees Outside of Woodland continued

Additional species or groups benefiting from conservation actions:

- Other veteran trees
- Bryophytes

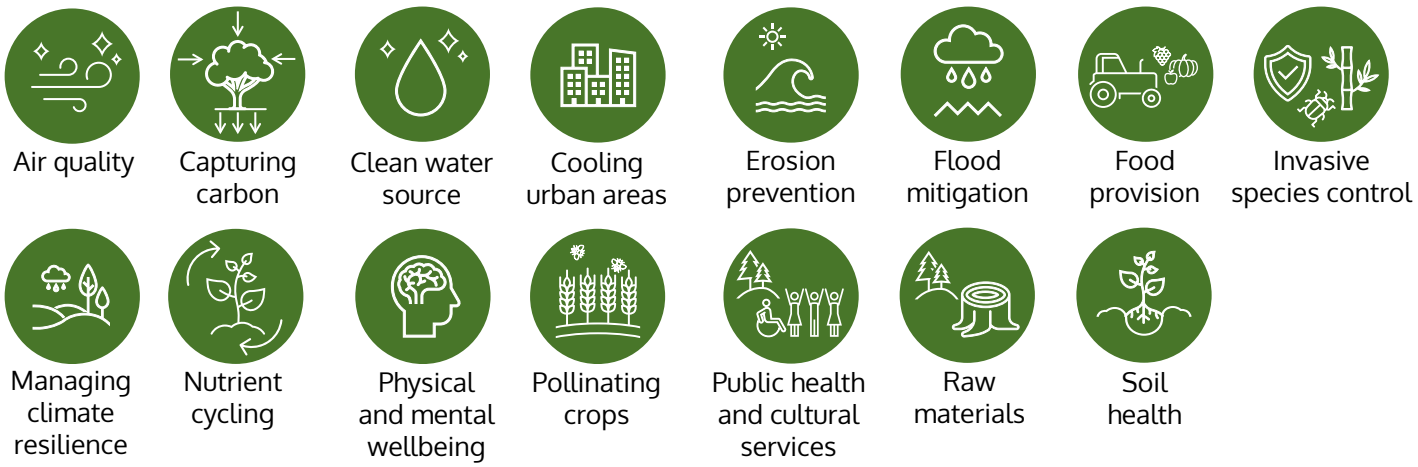
The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

- PM9 - 13
- PM23 - 26

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Grassland and Heathlands
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



Scrub and Mosaic

Trees in hedgerows, roadsides, and fields provide habitats, support landscape connectivity, stabilise soil, capture carbon, and enhance rural and urban character.

Nightingale
Luscinia megarhynchos

Table 31a. Scrub and Mosaic assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Nightingale *Luscinia megarhynchos*	• Manage scrub habitats to maximise growth at the thicket stage. • Cut scrub in reasonable blocks rather than in many small, widely dispersed patches, encouraging dense layers of scrub to develop, including bramble. • Implement appropriate coppicing practices, within appropriate regulations and restrictions, to maintain all stages of the coppice lifecycle within the woodland, with sequentially coppiced coupes adjacent to each other on rotation. • Manage deer populations to sustainable levels to promote a diverse vegetation structure. • Connect existing suitable habitats with tall, thick hedges. • Promote wet woodland restoration via riparian management techniques to enhance invertebrate presence.

Table 31b. Scrub and Mosaic assemblage shortlisted species showing recovery potential

Species	Potential Measures
Red-backed shrike	• Actively create, restore, and manage heathland habitats, including scrub cover and dedicated hibernation areas. Manage predator threats, reduce recreational disturbance, minimise fire risks, and increase public awareness and appreciation. • Decrease habitat fragmentation by creating corridors, such as hedgerows, buffer strips, raised banks, and set-aside land, to facilitate species movement. • Enhance recolonisation potential for both species by providing suitable habitats, such as low-input, structurally diverse grasslands, to support healthy populations of prey.
Adder	See Red-backed shrike

Scrub and Mosaic continued

Additional species or groups benefiting from conservation actions:

- Other lichens and fungi
- Bryophytes

The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

- PM14 - 17
- PM70

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:

Still Waters

Pingos, lakes, ponds, gravel pits, and reservoirs provide vital habitats for aquatic plants, invertebrates, and animals, supporting biodiversity, enhancing Norfolk's scenic beauty, and offering recreational opportunities.

Great Crested Newt
Triturus cristatus

Table 32a. Still Waters assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Great Crested Newt *Triturus cristatus*	• Create high-quality terrestrial habitats nearby to support foraging and hibernation, including undisturbed areas with deadwood or stones to serve as hibernacula. • Increase connectivity between known metapopulation by providing a range of habitats eg seasonal and permanent ponds, those which are shaded and those which are open • Establish or maintain large, fish-free ponds, ideally located within 1 km of other ponds suitable for Great Crested Newts. • Ensure ponds have gently sloping entrances to allow easy access for newts and other wildlife.

Table 32b. Still Waters assemblage shortlisted species showing recovery potential

Species	Potential Measures
Common toad	Create nearby high quality terrestrial habitat.
Ribbon leaved water plantain	• Conduct habitat disturbance (deweeding and desilting) and restore site hydrology. • Re-introduce the species in locations where there is a suitable habitat.
Opposite-leaved pondweed	See Ribbon leaved water plantain
Starfruit	Create open vegetation at pond edges where appropriate.
Zircon reed beetle	Ensure marginal sedges are present as needed.
Haliplus variegatus beetle	Maintain soft substrates and stoneworts where appropriate.
Stoneworts	Keep water clean and maintain mineral substrates.
Whooper swan	Implement land management practices to ensure nearby safe feeding areas on farmland are available.
Frogbit	Maintain or improve marsh ditches and pools to create slow-moving, calcareous conditions.
Water-violet	See Frogbit
Orange-horned green colonel	See Frogbit

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Still Waters continued

Table 32b. Still Waters assemblage shortlisted species showing recovery potential continued

Species	Potential Measures
Sigara longipalis/Water boatman	Restore appropriate habitat while conducting ecological research and monitoring to better understand specific species requirements.

Additional species or groups benefiting from conservation actions:

- Water beetles
- Aquatic macrophytes

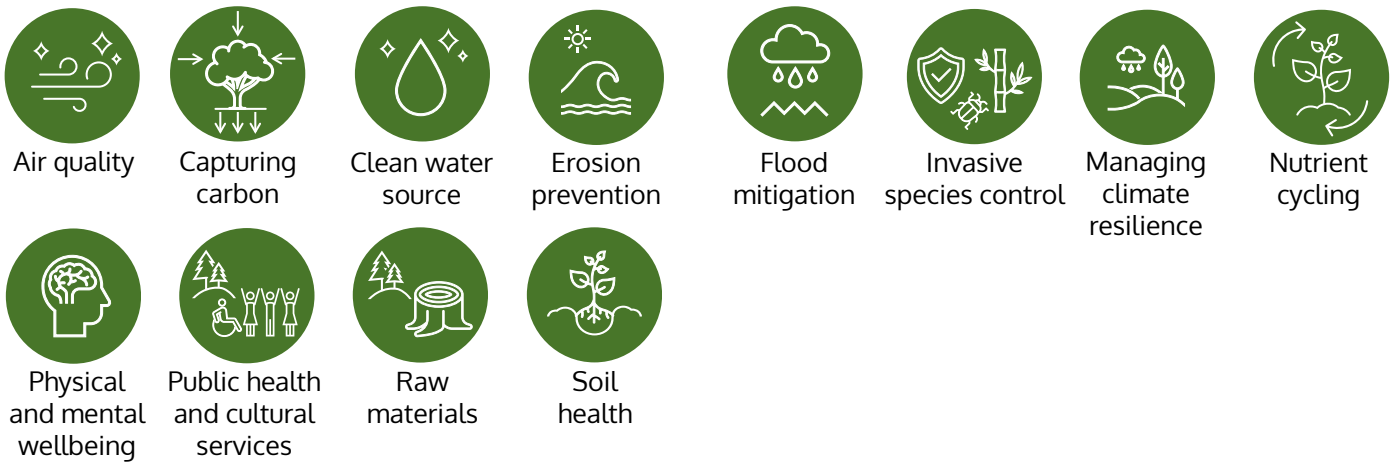
The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

- PM54 - 56
- PM69

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Farmland
- Freshwater
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Rivers and Riverside Habitats

Rivers, chalk streams, riparian areas, and floodplains form dynamic ecosystems that support diverse wildlife, act as corridors and aid in water purification, flood management and water quality, benefiting biodiversity and human communities.

Kingfisher
Alcedo atthis

Table 33a. Rivers and Riverside Habitats iconic flagship species indicating habitat health

Species	Potential Measures
Kingfisher *Alcedo atthis*	Improve water quality and create wetland habitat and riparian tree planting.

Table 33b. Rivers and Riverside Habitats assemblage shortlisted species showing recovery potential

Species	Potential Measures
Spined loach	Employ suitable substrate and vegetation management regimes.
Brook lamprey	See Spined loach
Depressed river mussel	Removal of invasive species where possible and implement additional biosecurity measures. Improve overall water quality.
Desmoulin's whorl snail	Enhance calcareous water sources, ensuring the presence of marginal reed grasses and sedges.
Beaver	• As appropriate, follow IUCN guidelines for reintroductions into fenced enclosures, accompanied by long-term monitoring and a management plan. Additionally, follow Natural England guidance for licensing wild release, managing the existing wild beaver populations, and developing long-term management plans for beavers in England. Natural England can issue licences to projects wanting to reintroduce beavers into the wild, where these projects demonstrate clear benefits and where risks can be avoided, mitigated or managed [25]. • Ensure access to freshwater habitats, ideally wooded, slow-flowing, and in broad river valley bottoms. Freshwater areas of sufficient size, with adjacent foraging resources, will support natural restoration of river and wetland ecosystems, aiming to increase habitat diversity.
Salmon	Conduct riparian tree planting to enhance shading of river channels and mitigate the effects of increased temperatures

Rivers and Riverside Habitats continued

Additional species or groups benefiting from conservation actions:

- Grazing molluscs
- Aquatic macrophytes
- Otters
- Water shrews

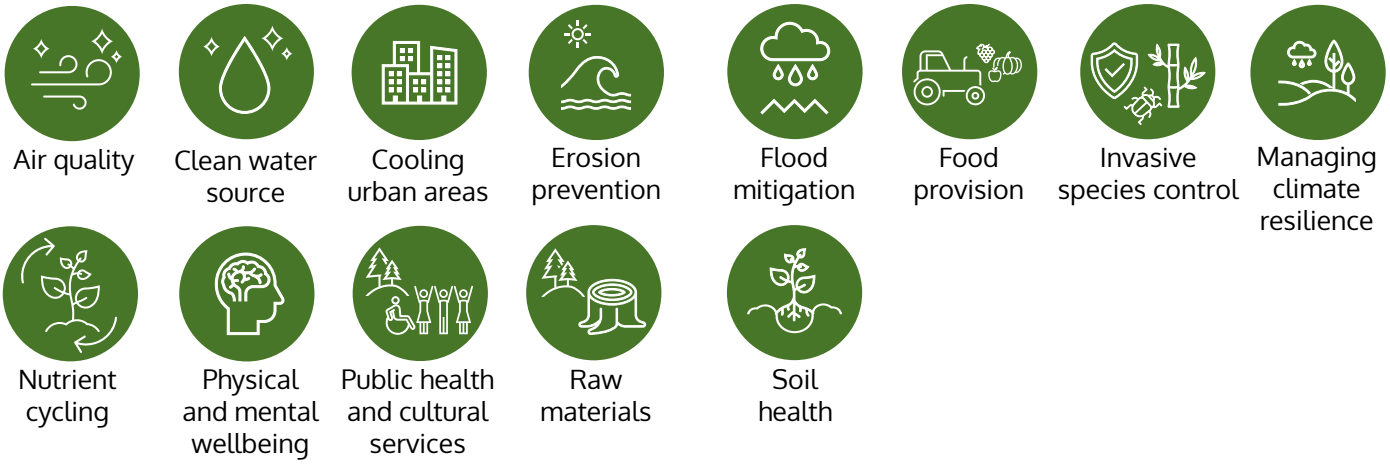
The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

- PM54 - 56
- PM69

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Farmland
- Freshwater
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



Lowland Fen

Lowland fens, peatlands, river valleys, and fen edges with waterlogged, peat-forming ecosystems support rare plants, birds, and insects. Vital for carbon storage, water purification, and flood control, they are key for biodiversity and ecosystem services.

Fen orchid
Liparis loeselii

Table 34a. Lowland Fen assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Fen orchid *Liparis loeselii*	Restore and create calcareous fens and wet meadows to promote connectivity, incorporating management techniques like disturbance and appropriate cutting and grazing regimes. Reduce numbers and the pressure of deer in fens using sustainable techniques.

Table 34b. Lowland Fen assemblage shortlisted species showing recovery potential

Species	Potential Measures
Fen puffball	See Fen orchid, **Table 34a**
Early marsh orchid (cream flowered form)	See Fen orchid, **Table 34a**
Greater water parsnip	Translocation of appropriate specimens to prepared areas of habitat, incorporating implications of threats of disease.
Milk parsley	See Greater water parsnip
Tansy beetle	Remove riverside willow and Himalayan balsam to promote growth; plant in gaps to aid beetle movement and create flood-safe areas. Use temporary fencing and manage grazing to protect Tansy.
Fen ragwort	• Manage wetlands and river margins to ensure seasonal flooding and support habitat health. • Reduce numbers and the pressure of Chinese water deer in fens. • Reduce the pressure of increasing winter water levels by implementing flood alleviation measures.
Swallowtail	See Fen ragwort
Broads long legged fly	Create and restore general habitats in lowland fen areas.
Bure long legged fly	See Broads long legged fly
Galeruca laticolis beetle	See Broads long legged fly
Cephalops perspicuus fly	See Broads long legged fly
Karita paludosa spider	Maintain sedge beds by leaving litter in place and managing water levels to support spider habitats.
Centromerus semiater	See *Karita paludosa* spider
Neon valentulus	See *Karita paludosa* spider

Lowland Fen continued

Table 34b. Lowland Fen assemblage shortlisted species showing recovery potential continued

Species	Potential Measures
Hygrolycosa rubrofasciata	For fen and fen carr, maintain water table levels and apply "re-wetting" techniques to enhance spider habitats.
Gongylidiellum murcidum	See *Hygrolycosa rubrofasciata*
Swollen spire snail	In appropriate areas, implement appropriate cutting regimes to encourage Reed sweetgrass (*Glyceria maxima*) dominance over Phragmites. Alternatively, create areas within water treatment system reedbeds where the snail can be translocated to.
Fen mason-wasp	Create and enhance specific habitats, including creating soil banks and south facing slopes, and ensuring areas of bare ground are included.
Large marsh grasshopper	Restore and connect fragmented habitats to support species movement, and support translocation projects eg Citizen Zoo.
Baryphyma gowerense spider	Conduct scrub clearance and maintain sedge beds through cutting.

Lowland Fen continued

Additional species or groups benefiting from conservation actions:

- Fungi
- Orchids

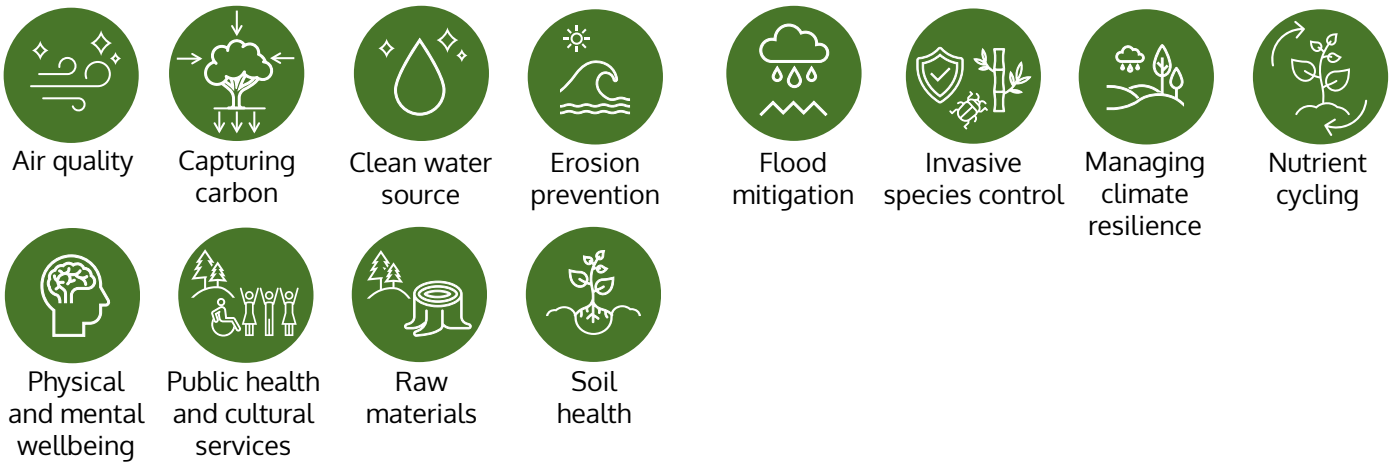
The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

- PM42 - 53
- PM57 - 59

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Grassland and Heathlands
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Chalk Grassland

Norfolk's chalk grasslands, on shallow, chalky soils, support a unique diversity of wildflowers and rare invertebrates. These nutrient-poor habitats foster specialised plant communities, making them a priority for restoration and protection.

Chalkhill blue
Lysandra coridon

Table 35a. Chalk Grassland assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Chalkhill blue *Lysandra coridon*	Improve and create chalk grassland to support populations of Horseshoe vetch.

Table 35b. Chalk Grassland assemblage shortlisted species showing recovery potential

Species	Potential Measures
Field gentian	Maintain grassland at a mean height of 3-5 cm, with approximately 5% bare soil at the end of the grazing period; cattle grazing is preferred.
Chalk eyebright	• Enhance habitats with ecological research and monitoring to better understand species requirements. • Use improved grazing techniques with traditional breeds, controlled hay-cutting, and scrub clearance.
Pasqueflower	See Chalk eyebright
Firedot lichen	See Chalk eyebright
Man orchid	Manage road verges, escarpments, old chalk pits, limestone quarries, scrub edges, and dune slacks on suitable soils.
Fly orchid	Apply grazing management, excluding livestock during the spring and early summer flowering periods, and consider the existing pressure from wild herbivores.
Juniper	Manage areas to regenerate juniper and associated species by creating scrapes down to bare soil for seed establishment, and exclude rabbits, deer, and sheep from these areas.

Chalk Grassland continued

Additional species or groups benefiting from conservation actions:

- Rock rose
- Horseshoe vetch
- Grassland bee species
- Grassland butterfly species
- Crickets/grasshoppers
- Other bat species

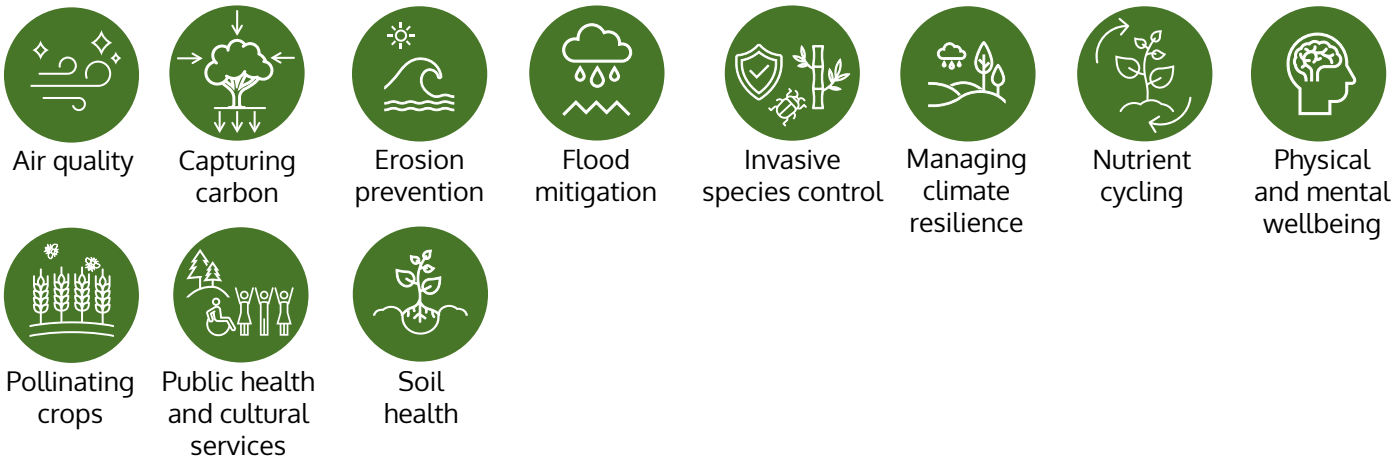
The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

- PM37 - 40 where appropriate
- PM57 - 59

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Farmland
- Woodland, Trees and Scrub
- Grassland and Heathlands
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Brecks Grass Heath

The Brecks open heathlands and sandy soils are home to rare, specialised species like the stone-curlew. This unique, dry, nutrient-poor landscape is culturally and ecologically significant, making it a conservation priority.

Stone-curlew
Burhinus oedicnemus

Table 36a. Brecks Grass Heath assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Stone-curlew *Burhinus oedicnemus*	• Prevent nest destruction by farm machinery to support Stone Curlew population growth. Focus on protecting farmland nests and creating nesting habitats within crops as part of successful species recovery efforts. Agri-environment schemes should provide financial support for open ground nesting habitats near managed feeding areas. • In grasslands, create open, sparsely vegetated areas with stony ground, grazed short by rabbits and sheep. • In suitable arable fields, prepare open, stony plots with buffer zones to protect nesting birds and chicks from machinery, providing undisturbed nesting spaces. • When considering locations, the presence of/potential for Stone-curlew should be checked anywhere with light sandy soils.

Table 36b. Brecks Grass Heath assemblage shortlisted species showing recovery potential

Species	Potential Measures
Woodlark	In Brecks and forest clearings, restore and maintain a network of open spaces within forestry plantations and connect lowland heaths.
Fingered speedwell	Maintain appropriate arable margins using low-input methods and introduce species where necessary.
Grey carpet	See Fingered speedwell
Interrupted brome	See Fingered speedwell
Spring speedwell	Use livestock and rabbit grazing to create habitats and disturb soil with low-input arable methods to establish appropriate arable margins.
Bur medick	See Spring speedwell
Seaside pansy	See Spring speedwell
Golden lantern spider	Employ favourable grazing regimes and use low-input methods to disturb soil, creating suitable arable margins.
Sand catchfly	See Golden lantern spider
Sandwich click beetle	See Golden lantern spider

Brecks Grass Heath continued

Table 36b. Brecks Grass Heath assemblage shortlisted species showing recovery potential continued

Species	Potential Measures
Lycoperdina succincta beetle	Recreate connected habitats by applying grazing techniques and removing invasive species.
Verrucaria xyloxena lichen	See *Lycoperdina succincta* beetle
Field wormwood/ Breckland mugwort	• In Brecks and open mosaics, maintain open grassland on sandy soil, control grazing regimes, remove invasive species, and increase the population of field wormwood. • Introduce Field Wormwood plants cultivated off-site in locations that will link current beetle populations'
Proliferous pink	See Field wormwood/Breckland mugwort
Wormwood moonshiner	See Field wormwood/ Breckland mugwort

Brecks Grass Heath continued

Additional species or groups benefiting from conservation actions:

- Rock rose
- Horseshoe vetch
- Grassland bee species
- Grassland butterfly species
- Crickets/grasshoppers
- Other bat species

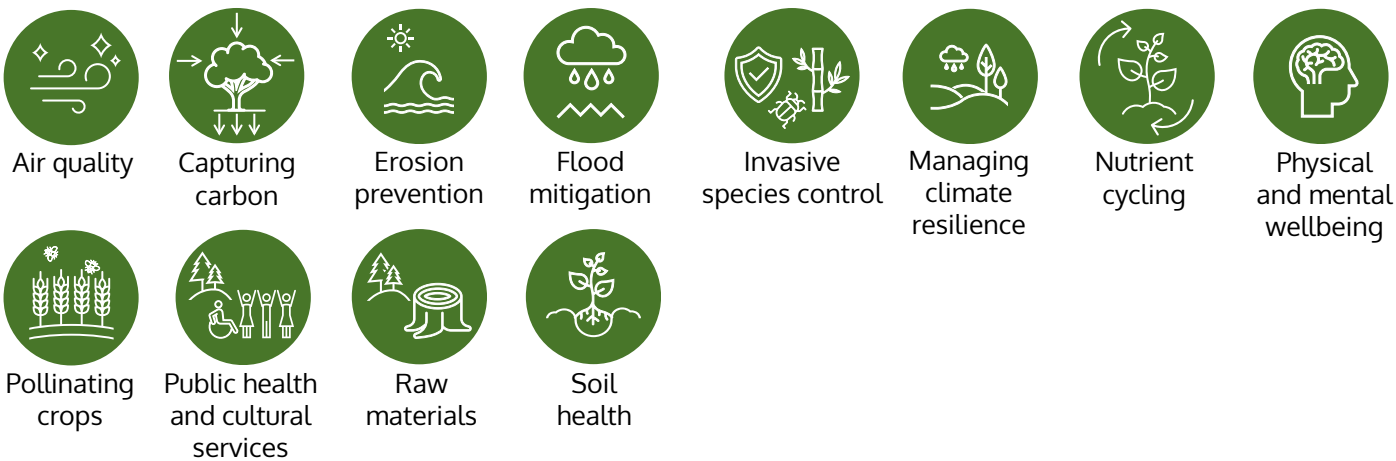
The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

- PM4
- PM14 - 20
- PM27 - 32
- PM70

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Grassland and Heathlands
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Acid Grassland and Heathland

Nutrient-poor acid grasslands and heathlands, with fewer flower species than calcareous grasslands, provide habitats for specialised species like heathland birds and invertebrates. They are crucial for carbon storage, water regulation, and biodiversity across Norfolk's landscapes.

Nightjar
Caprimulgus europaeus

Table 37a. Acid Grassland and Heathland assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Nightjar *Caprimulgus europaeus*	Recreate, manage and restore key heathland habitats, alongside implementation of effective rotational forestry management.

Table 37b. Acid Grassland and Heathland assemblage shortlisted species showing recovery potential

Species	Potential Measures
Marsh gentian	Open up habitats through management practices like grazing or occasional light burning, ensuring mature plants are protected.
Grayling butterfly	Improve habitat management by ensuring the inclusion of essential foodplant species.
Silver studded blue	Maintain a mosaic of heathland in different stages, with bare soil and early successional vegetation, including heather, to support populations of symbiotic ants.
Cylindrical whorl snail	Restore appropriate habitats by improving agricultural practices to minimise agrochemical pollutants.
Great sundew	Create new areas of suitable habitat and relocate plants where necessary.
Roundleaf sundew	See Great sundew
Bell heather	Apply appropriate management techniques, such as grazing, cutting, and habitat restoration, to increase the overall area of habitat.

Acid Grassland and Heathland continued

Additional species or groups benefiting from conservation actions:

- Heathland bee species
- Heathland butterfly species

The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

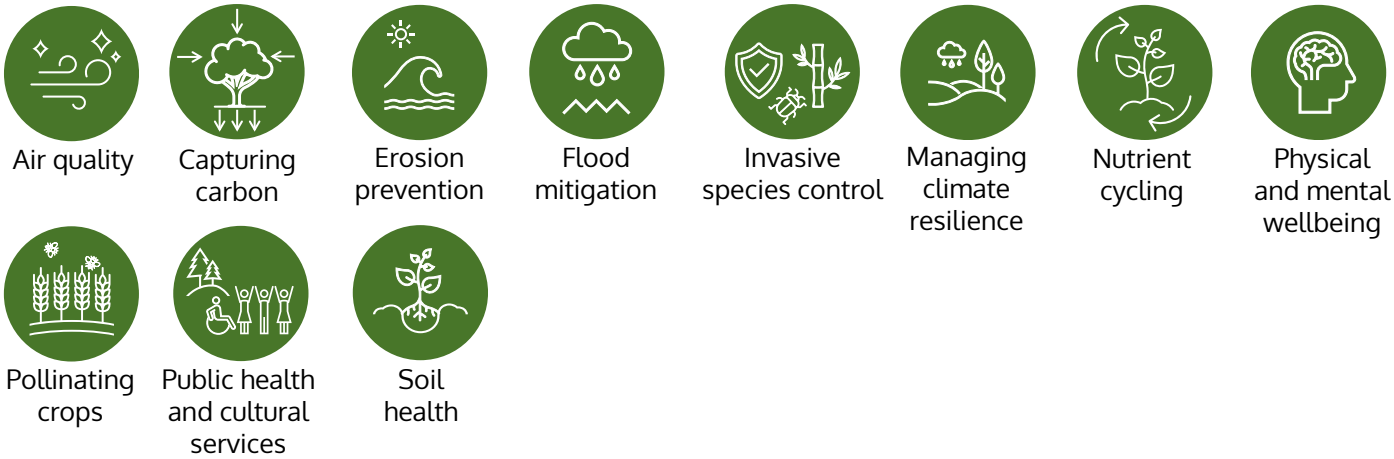
- PM27 - 32 (where appropriate)

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations.

These measures could offer solutions to address pressures in:

- Farmland
- Freshwater
- Grassland and Heathlands
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



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Urban, Built and Garden Environments

Urban green spaces – parks, gardens, and street trees – are vital wildlife refuges that aid nature recovery, improve air quality, and enhance residents' wellbeing.

Hedgehog
Erinaceus europaeus

Table 38a. Urban, Built and Garden Environments assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Hedgehog *Erinaceus europaeus*	• Create quality semi-natural habitats and integrate artificial features in urban, built, and garden areas. • Add 13x13 cm "hedgehog highways" at fence bases and provide hedgehog houses. • Include undergrowth, shrubs, hedges, deadwood, woodland, and grassland in gardens. • Practise wildlife-friendly gardening with wildflowers and scrub habitats for insects. • Reduce or eliminate artificial fertilisers and pesticides; promote regenerative farming. • Manage garden and park grass to create long grass, short turf, open soil, and tussocks. • Let dense vegetation grow via compost, log, and leaf piles in gardens. • Boost insect numbers and therefore foraging areas with wildflowers, ponds, and less mowing. • Avoid pesticides to support insects; encourage organic, low-herbicide gardening and farming. • Raise awareness of hazards like landscaping injuries, pond drownings, and net entanglements. • Train greenspace managers and landscapers on hazard mitigation, habitat clearance timing, and wildlife-friendly features. • Install small mammal road signs at key roadkill hotspots, especially near town and village speed limits.

Urban, Built and Garden Environments continued

Table 38b. Urban, Built and Garden Environments assemblage iconic flagship species indicating habitat health

Species	Potential Measures
Starling	See Hedgehog and in addition: • Install nest boxes, use building eaves, and preserve nesting sites, including on new build homes and via retro-fitting initiatives. • Encourage wildlife gardening for food, roosting, and nesting spaces.
House martin	See Starling
House sparrow	See Starling
Swift	See Starling
Swallow	See Starling
Greenfinch	See Starling
Barberry Carpet	See Starling

Urban, Built and Garden Environments continued

Additional species or groups benefiting from conservation actions:

- Bee and pollinator species
- Urban trees
- Other bat species

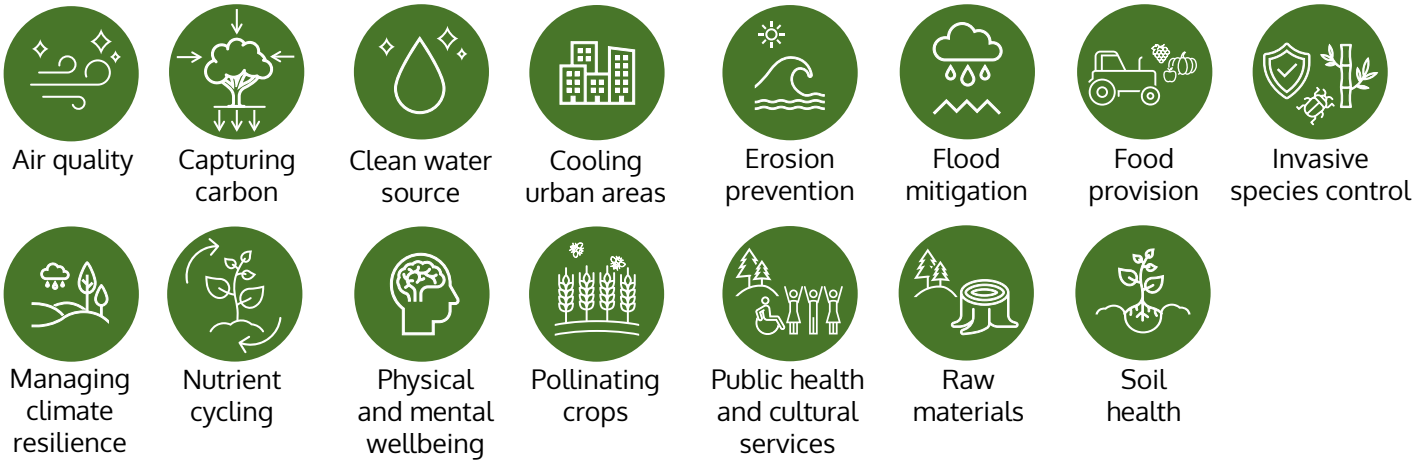
The appropriate potential measures for these species could be implemented at locations specified within the Local Habitat Map within the following habitat priority codes:

- PM1 - 4
- PM21 - 26
- PM33 - 36
- PM54 - 55
- PM69 - 70

As well as in the existing APIB where the relevant habitat types occur and as unmapped measures across various locations. These measures could offer solutions to address pressures in:

- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Grassland and Heathlands
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:



Nature-based solutions for water security: Norfolk Water Strategy Programme

Norfolk is experiencing growing pressures on its water resources. Flooding incidents and water shortages are becoming more frequent. Increasing pollution and the destruction of native habitats threatens the ability of freshwater bodies to support biodiversity.

The Norfolk Water Strategy Programme (NWSP) aims to tackle these challenges through investing in nature-based solutions (NbS) and restoring more natural processes within key catchments.

Who's involved?

The programme is a partnership between:

- Water Resources East
- Norfolk County Council
- Anglian Water
- The Nature Conservancy (TNC).

NWSP are supported by government agencies and national NGOs. Funding for projects so far has been secured from WWF (Finish, HSBC), EA, DEFRA, and TNC's GO Fund (Coca Cola).

What have they achieved?

Based on a first-of-its-kind analysis, the NWSP launched a £30 million business case for investing in NbS in February 2024. Each £1 invested in NbS in Norfolk would deliver £6.70 in benefits. These benfits include:

- improved water resources and water quality
- enhanced habitats for wildlife
- the ability to unlock housing growth while protecting the environment.

This analysis is grounded in a combination of innovative modelling, stakeholder engagement, and real-world experience to demonstrate how emerging markets for nutrients and biodiversity could offer new income streams for the county's landowners.

The programme's analysis shows that priority actions should focus on reducing, slowing and infiltrating runoff of water from land. Opportunity maps have been developed that target NbS for maximum benefit.

A silt trap in the Wensum catchment, designed to intercept run off and suspended sediment from agricultural land before it enters the river.

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Case Study

Work to reconnect the floodplains of the River Yare at Coston

How do they do it?

NWSP is working with a variety of organisations to test and implement NbS to improve water security, for example, leaky ponds, buffer strips and river restoration.

The programme is also developing methods to screen projects for investment and to target interventions for maximum benefit, as well as options for governance.

What's next?

Over the next 18 months, NWSP will deliver and monitor pilot projects which will generate further understanding of the specifics of design, delivery and financing in partnership with delivery organisations in Norfolk.

The programme will conduct work to understand the scale of opportunity NbS represent for environmental benefits and identify novel funding streams and strategies for future delivery.

The ultimate aim is to develop a series of NbS projects which can be combined into an investment package for private and public funding, managed as a 'Water Fund'. Water Funds are a well-established model for facilitating collective action to address water security challenges through the implementation of NbS. Norfolk is one of two European pilots selected for Water Funds by TNC, to add to TNC's global portfolio of water fund projects.

Find out more at wre.org.uk

Key species

The LNRS prioritisation process identified 25 key species representing Norfolk's most pressing conservation needs. These include mammals, reptiles and amphibians, fish, lichens and fungi, vascular and non-vascular plants, invertebrates, and birds. Collaboration with biodiversity experts and stakeholders ensured a balanced selection across taxonomic groups while reflecting public priorities. Below, each species is showcased with profiles outlining conservation measures, habitats, and broader ecological benefits. This highlights the interdependence of species and habitats, offering a roadmap for action to safeguard Norfolk's natural heritage.

Each of these species is profiled in this section (**Table 39 - 63**), detailing their primary conservation measures, suitable habitats, and the broader biodiversity benefits of their protection. Within the profile, appropriate measures that have been mapped within the Local Habitat Map are indicated. These are intended to identify areas which could support these species, but final decision making processes on any intended work must involve specific assessment of the detailed ecological requirements and bespoke conservation needs. The identified areas may be linked to the habitat based measures indicated, or to information available regarding the species distribution across the county (see **Figures 11** and **12**). The processes are designed to represent an opportunity for nature recovery in the right places, whilst taking into account the sensitivity of vulnerable areas and species.
It is anticipated that throughout the stages of LNRS production before the publication of the final document, there will be updated information available regarding more bespoke species specific measures across the county. This may be via ongoing project information or responses to this public consultation. Where possible, these will be incorporated by the Norfolk and Suffolk Nature Recovery Partnership into the available measures.

The 25 key species for Norfolk:

- Basil-thyme case-bearer
- Crested buckler fern
- Crested cow-wheat
- Dwarf eelgrass
- Eurasian curlew
- European eel
- Fen raft spider
- Holly-leaved naiad
- Intermediate stonewort
- Lapwing
- Lesser water measurer
- Little whirlpool ramshorn snail
- Narrow-mouthed whorl snail
- Natterjack toad
- Northern pool frog
- One-grooved diving beetle
- Orange-fruited elm lichen
- Scarce vapourer
- Serotine bat
- Starlet sea anemone
- Starry Breck Lichen
- Suffolk lungwort
- Water vole
- White-clawed crayfish
- Witham orb mussel

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Basil-thyme case-bearer

Coleophora tricolor

Basil-thyme, the sole food source that supports the Basil-thyme case-bearer, thrives in ruderal areas and sparsely vegetated ground. It is commonly found on unimproved Breck grassland where open conditions support its growth. Additional habitats include disused airfields with cracking hard surfaces and the edges of tracks and rides within conifer plantations established on former heathland.

Table 39a. Basil-thyme case-bearer primary measure

Primary measure	Primary measure details
Habitat Management	• Large areas of land are likely required for the species and its foodplant. • Promote early successional stages to encourage the foodplant, with limited ground disturbance (eg rotovation).

Table 39b. Basil-thyme case-bearer other relevant measures

Other relevant measures	Other relevant measures details
Grazing Control	Manage sheep and rabbit grazing, as well as deer access, in areas where the foodplant (Basil Thyme) is present to prevent overgrazing.
Ground Disturbance	Expand the creation of disturbed bare ground strips using a harrow to break up soil and reduce dense grass along forest corridors and rides.

These measures could also offer solutions to address pressures in these habitats:

- Farmland
- Grassland and Heathlands

Other linked assemblages that would benefit from these measures are:

- Brecks Grass Heath
- Acid grassland and heathland

The mapped measures for Calcareous grassland [PM37 - 40], especially linked to foodplant records, are potentially relevant for Basil-thyme case-bearer.

These measures are considered to support the following co-benefits:

Air quality | Food provision | Invasive species control | Managing climate resilience | Nutrient cycling | Physical and mental wellbeing | Pollinating crops | Soil health

Crested buckler fern

Dryopteris cristata

Crested bucker fern occurs in more acidic areas within base-rich fens. The species can persist in swampy habitats and open carr.

Table 40a. Crested buckler fern primary measure

Primary measure	Primary measure details
Habitat Management	Control scrub encroachment to maintain suitable conditions.

Table 40b. Crested buckler fern other relevant measures

Other relevant measures	Other relevant measures details
Hydrology Restoration	Restore hydrology on protected sites to ensure consistently high water table levels.
Water Pollution Reduction and Mitigation	• Encourage sustainable agricultural practices to reduce eutrophication and nutrient contamination. • Provide suitable areas for floating habitats which often provide some isolation from enrichment pollution.

These measures could offer solutions to address pressures in:

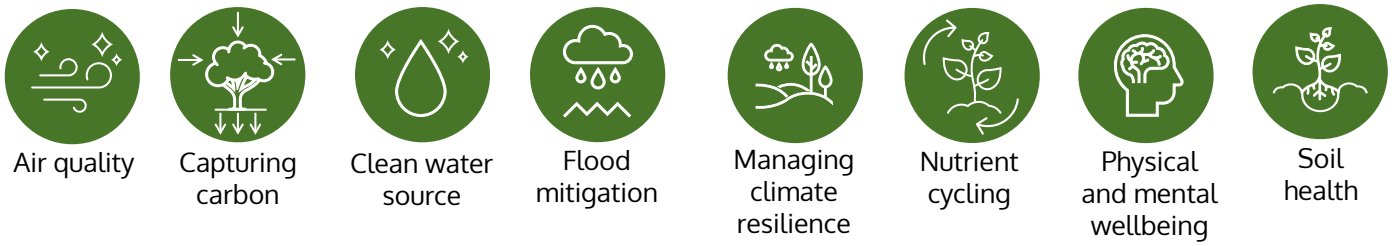
- Farmland
- Freshwater

Other linked assemblages that would benefit from these measures are:

- Lowland Fen

The mapped measures for wet woodland, fen or wetland [PM05 - 08; PM57 - 62] are potentially relevant for Crested bucker fen.

These measures are considered to support the following co-benefits:



Crested cow-wheat

Melampyrum cristatum

The suitable habitats for Crested cow-wheat are Margins, rides, and glades within ancient oak woodland, as well as associated field hedgebanks and roadsides.

Table 41a. Crested cow-wheat primary measure

Primary measure	Measure details
Species-Specific Action	• Maintain appropriate woodland habitats through coppicing and keeping rides and glades open. • Implement road verge management, ensuring arisings are removed, re-introducing specimens where appropriate on suitable soils. • Prevent spray drift onto potentially suitable habitat near populations.

Table 41b. Crested cow-wheat other relevant measures

Other relevant measures	Other relevant measures details
Habitat Creation, Expansion, and Connectivity	Expand woodlands to reconnect fragmented sites and increase suitable habitat.

These measures could offer solutions to address pressures in:

- Farmland
- Woodland
- Trees and Scrub

Other linked assemblages that would benefit from these measures are:

- Native Woodland
- Trees out of woodland
- Farmed landscapes

The mapped measures for Woodland [PM01 - 04] and Arable Field Margin [PM57 - 62] are potentially relevant for Crested cow-wheat.

These measures are considered to support the following co-benefits:

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Dwarf eelgrass

Zostera noltei

Dwarf eelgrass is typically found in shallow marine environments on intertidal mudflats. These habitats are characterised by brackish or fully saline waters, often in sheltered coastal locations.

Table 42a. Dwarf eelgrass primary measure

Primary measure	Primary measure details
Relocation and Replanting Projects	• Collect eelgrass seeds from healthy populations, ensuring permits and permissions are in place. • Prepare and propagate seeds before planting directly into restoration sites using appropriate methods. • Monitor and maintain planted populations to ensure successful establishment.

Table 42b. Dwarf eelgrass other relevant measures

Other relevant measures	Other relevant measures details
Sustainable Farming Practices	• Manage grazing, mowing, fertiliser, pesticide, and slurry use. • Implement buffer zones and improve planting to minimise impacts from freshwater inputs and terrestrial run-off, reducing sedimentation.
Water Pollution Reduction and Mitigation	• Implement measures to reduce urban and industrial pollutants entering coastal waters, eg use of buffer strips to reduce agricultural run off, improve stormwater management, increase water quality testing to monitor levels. • Focus on reducing sedimentation from coastal erosion to protect sensitive habitats – this can be achieved via soft engineering using sand nourishment and sandscaping.
Recreational Disturbance Reduction and Mitigation	Strategically deploy eco-moorings to minimise human disturbance in sensitive areas.
Fisheries Management	• Reduce pump-scoop fishing in vulnerable locations. • Promote plans to reduce sedimentation caused by coastal engineering and dredging activities eg via alternative sustainable methods and infrastructure.

Dwarf eelgrass continued

These measures could offer solutions to address pressures in:

- Freshwater
- Coastal

Other linked assemblages that would benefit from these measures are:

- Saltmarshes and Lagoons

The mapped measures for Saltmarsh and Mudflat [PM63 - 68] are potentially relevant for Dwarf eelgrass where they align with appropriate intertidal zone areas.

These measures are considered to support the following co-benefits:

Eurasian curlew

Numenius arquata

Eurasian curlew are found in open lowland environments. Breeding populations are confined to the Brecks dry acid grassland and heathland. Freshwater wetland areas and lowland measures and pastures are used for feeding habitats, throughout the year, alongside coastal habitats and farmland for wintering areas.

Table 43a: Eurasian curlew measures

Primary measure	Measure details
Habitat Creation and Restoration	Address habitat loss from land use changes, drainage, and degradation by creating and expanding wet habitats suitable for nesting adults, eggs, and chicks.

Table 43b. Eurasian curlew other relevant measures

Other relevant measures	Other relevant measures details
Nest Protection	Employ measures like electric fencing and emerging technologies to protect nests and improve the success rate of hatching chicks.
Predator Management	Manage problematic species (including invasive non-native species, pests, and diseases). Predation impacts vary depending on habitat quality, configuration, and other factors; trial methods should focus on reducing predation impacts and actively protecting nests.
Sustainable Farming Practices	Reduce pressures by managing grazing, mowing, fertiliser, pesticide, and slurry application. Employ appropriate agri-environment scheme designs and promote the adoption of relevant prescriptions in suitable areas.

Eurasian curlew continued

These measures could offer solutions to address pressures in:

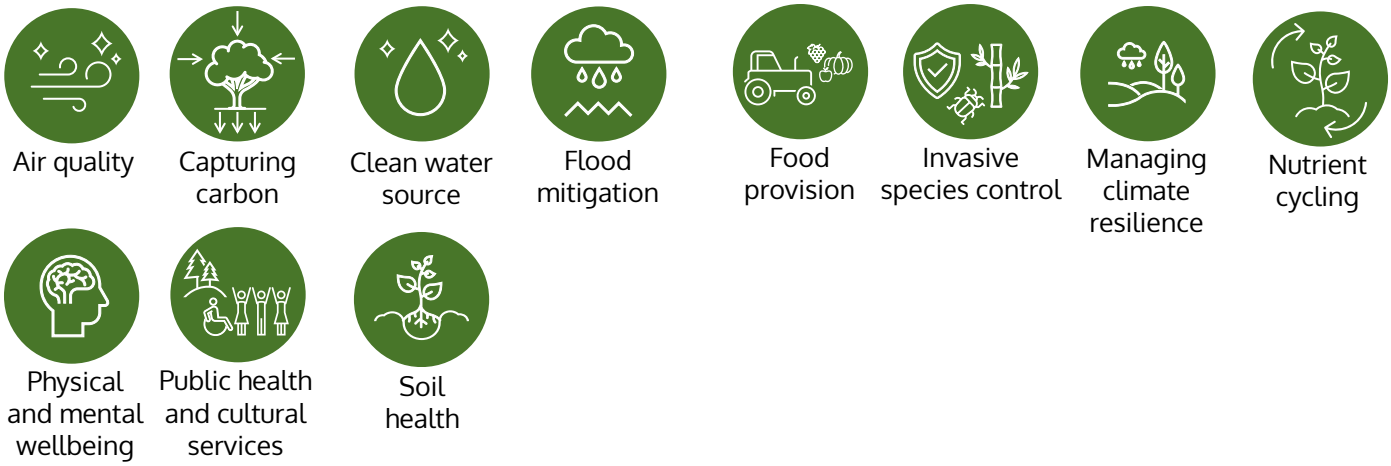
- Coastal
- Farmland
- Freshwater
- Grassland and Heathlands
- Invasive Species and Diseases

Other linked assemblages that would benefit from these measures are:

- Reedbeds and Freshwater Wetlands
- Lowland Meadows and Pasture
- Farmed Landscapes

The mapped measures for breeding in dry habitats of heathland [PM27 - 32] and wet grassland habitats for foraging [PM45 - 48] are potentially relevant for Eurasian curlew.

These measures are considered to support the following co-benefits:



European eel

Anguilla anguilla

European eel inhabits rivers, chalk rivers, active shingle rivers, saline lagoons, saltmarshes, intertidal mudflats, coastal floodplains, and marine environments. Born in the marine environment, they migrate into rivers and wetland habitats to mature into adulthood. The species requires good water quality and clear migratory routes along rivers. Primarily nocturnal, they spend the day hidden, buried in mud, or sheltering under logs and rocks within the water.

Table 44a. European eel primary measure

Primary measure	Primary measure details
Habitat Creation, Expansion, and Improved Connectivity	Where barriers cannot be removed, eel pass installations or nature-like fish passes should be considered to provide access to upstream habitats.

Table 44b. European eel other relevant measures

Other relevant measures	Other relevant measures details
Habitat Restoration and Enhancement	Improve the quality and quantity of refuge and foraging habitats to increase survival rates. In rivers, promote protective elver cover, such as bankside tree cover, tree roots, and woody debris, through rewilding techniques. Restoration measures that reinstate the natural river channel form (eg re-meandering) are beneficial. In lakes, focus on reinstating marginal woody debris and bankside vegetation.

European eel continued

These measures could offer solutions to address pressures in:

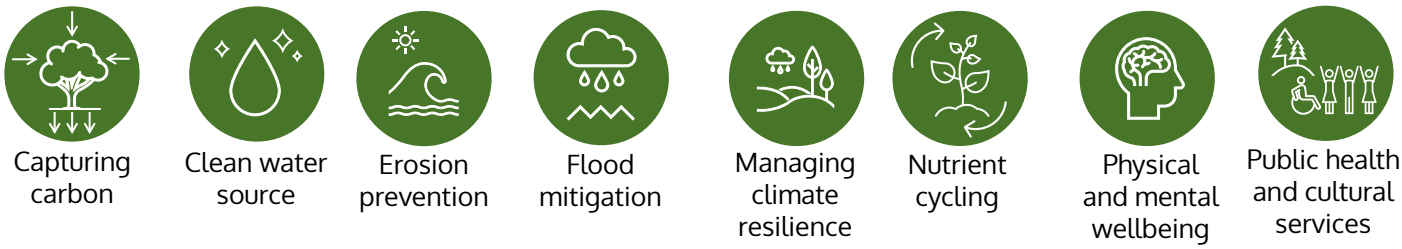
- Freshwater
- Invasive Species and Diseases

Other linked assemblages that would benefit from these measures are:

- Rivers and Riverside Habitats
- Saltmarshes and Lagoons

The mapped measures for Riparian habitat connecting to saltmarshes and marine environments [PM49 - 52; PM63 - 68] are potentially relevant for European eel, where appropriate.

These measures are considered to support the following co-benefits:



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Fen raft spider

Dolomedes plantarius

Fen raft spiders rely on saw-sedge (*Cladium mariscus*), particularly around small pools formed in old peat cuttings. (Pools dominated by fine-leaved grasses such as Molinia are not favoured. Young spiders hatching in early summer likely mature the following year, while those hatching in late summer typically spend two winters as juveniles.)

Table 45a. Fen raft spider primary measure

Primary measure	Primary measure details
Population Establishment	Continue establishing new populations and implement translocation to suitable sites.

Table 45b. Fen raft spider other relevant measures

Other relevant measures	Other relevant measures details
Habitat Restoration	Restore arable farmland to fen and grazing marshes around ancient fen remnants, creating new habitat to support species recovery.
Incorporate Key Vegetation	Include water soldiers (*Stratoides aloides*) in management plans to enhance feeding and nesting opportunities.

These measures could offer solutions to address pressures in:

- Farmland
- Freshwater

Other linked assemblages that would benefit from these measures are:

- Still Waters
- Reedbeds and Freshwater Wetlands
- Lowland Fen

The mapped measures for a ppropriate fresh and still water habitats [PM45 - 48; PM49 - 52; PM54 - 55; PM57 - 59] are potentially relevant for fen raft spider.

These measures are considered to support the following co-benefits:

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Holly-leaved naiad

Najas marina

Suitable habitats for holly-leaved naiad are meso-eutrophic waters with deep substrates of peat or silty mud, characteristic of the Norfolk Broads.

Table 46a. Holly-leaved naiad primary measure

Primary measure	Primary measure details
Re-Establishment of Colonies	Allow colonies to re-establish as sites become available following water quality improvements and habitat restoration.

Table 46b. Holly-leaved naiad other relevant measures

Other relevant measures	Other relevant measures details
Optimising Conditions for Growth	• Remove mud selectively on larger broads. • Excavate new sites, such as turf ponds, to encourage colonisation.
Nutrient Management	• Reduce nutrient loading wherever possible using a range of potential short, medium or long term solutions eg taking land out of agricultural use, use of riparian buffer strips, wetland construction and Broadland restoration. • Set and maintain target phosphorus levels for the Broads.

These measures could offer solutions to address pressures in:

- Coastal
- Farmland
- Freshwater

Other linked assemblages that would benefit from these measures are:

- Still Waters
- Lowland Fen

The mapped measures for appropriate shallow lake habitats [PM56] are potentially relevant for Holly-leaved naiad.

These measures are considered to support the following co-benefits:

Intermediate stonewort

Chara intermedia

Intermediate stonewort are found in high water quality with slightly brackish lakes of permanent, calcium-rich standing water. The habitat features a firm substrate with bare areas and minimal competition.

Table 47a. Intermediate stonewort primary measure

Primary measure	Primary measure details
Translocation	Translocate stoneworts to appropriate sites to support population establishment.

Table 47b. Intermediate stonewort other relevant measures

Other relevant measures	Other relevant measures details
Water Quality and Pollution Control	• Implement offsite remedial actions to tackle diffuse pollution. • Reduce water quality pressures using sustainable agricultural practices, reduction in run off, use of nature-based solutions and improved water treatment practices, as poor water quality has driven most declines in stonewort populations.
Habitat Management	Improve habitat topography at core sites to enhance suitability for stoneworts.
Boating Restrictions	Encourage environmentally sensitive boating activity at core sites, particularly propeller-driven craft that increase turbidity and uprooting.

These measures could offer solutions to address pressures in:

- Freshwater

Other linked assemblages that would benefit from these measures are:

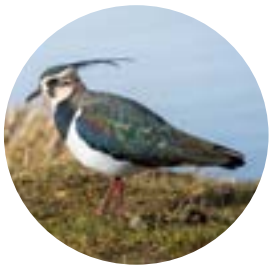
- Still Waters

The mapped measures for appropriate brackish shallow lake habitats [PM56] are potentially relevant for Intermediate stonewort.

These measures are considered to support the following co-benefits:

Lapwing

Vanellus vanellus



Breeding Lapwings in England prefer wet grasslands, marshes, and farmland with short vegetation for nesting and foraging, including areas with spring crops, cultivated exposed soil, or sparse heathland grassland. In marginal upland areas, they use short, wet, unimproved grassland or pasture.

Table 48a. Lapwing primary measure

Primary measure	Primary measure details
Sustainable Farming Practices to Reduce Pressures	• Manage grazing, mowing, fertiliser use, pesticides, slurry, and buffers effectively. • Implement agri-environment schemes tailored to meet breeding Lapwing requirements at an appropriate scale. • Actions include: ○ Creation of Lapwing plots in arable fields. ○ Growing spring cereals instead of autumn cereals. ○ Delaying or adjusting mowing, grazing, or crop cultivation timings. ○ Restoring wet grassland features and habitats and instigating suitable water level management regimes ○ Maintaining short swards on wet pastures through grazing and cutting regimes outside of the breeding season. • Actions considerations: ○ Ensure field operations do not destroy or remove nests. ○ Create bare ground patches across landscapes during autumn and winter for nesting and feeding. ○ Minimise or avoid cattle grazing between mid-March and May to prevent nest trampling.

Table 48b. Lapwing other relevant measures

Other relevant measures	Other relevant measures details
Maintenance of Existing Habitat	Protect habitats within areas around protected sites, ensuring the conservation of vital wintering sites.
Arable, Grassland, and Wetland Expansion	Maintain and expand wetland and grassland habitats through targeted recreation schemes for wetland birds, ensuring their functionality as core conservation areas.

Lapwing continued

These measures could offer solutions to address pressures in:

- Coastal
- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Grassland and Heathlands

Other linked assemblages that would benefit from these measures are:

- Farmed Landscapes
- Reedbeds and Freshwater Wetlands
- Lowland Meadows and Pasture

The mapped measures for Wet grassland measures and appropriate farmed landscape actions, including unmapped measures [PM45 - 48] are potentially relevant for Lapwing.

These measures are considered to support the following co-benefits:

Lesser water measurer

Hydrometra gracilenta

Lesser water measurer prefers flooded, well-vegetated ditches or surface wet fen (marsh) with dense vegetation.

Table 49a. Lesser water measurer primary measure

Primary measure	Primary measure details
Habitat Creation	Establish ditches in suitable areas to support the species' habitat needs.

Table 49b. Lesser water measurer other relevant measures

Other relevant measures	Other relevant measures details
Sea Defences	Install sea defences to mitigate the impact of rising sea levels and changes in salinity within habitats.
Population Translocation	Relocate populations to appropriate areas when necessary to ensure their survival.

These measures could offer solutions to address pressures in:

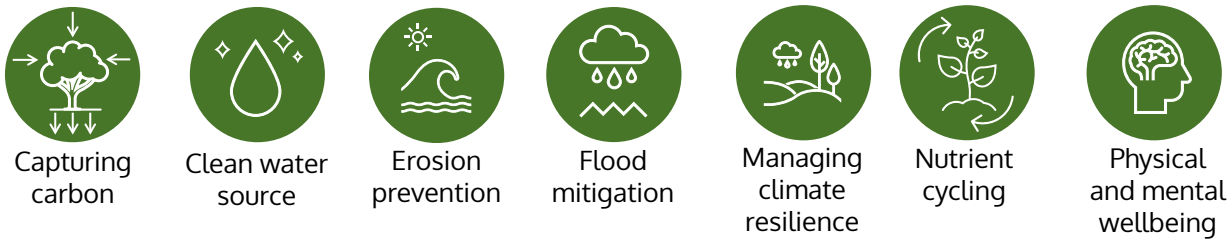
- Coastal
- Freshwater
- Grassland and Heathlands

Other linked assemblages that would benefit from these measures are:

- Reedbeds and Freshwater Wetlands
- Lowland Fen

The mapped measures for Fen and wetland measures in appropriate areas, including potential inland habitat creation mitigation projects [PM57 - 59] are potentially relevant for Lesser water measurer.

These measures are considered to support the following co-benefits:



Little whirlpool ramshorn snail

Anisus vorticulus

Little whirlpool ramshorn snail is found in coastal floodplains, lowland fens, and ponds with high water quality, fen vegetation, and stable water levels. Prefers drainage channels in traditionally managed grazing marshes with a high diversity of aquatic plants at late successional stages. Thrives in unpolluted, calcareous waters within marsh drains that support dense aquatic flora and favours ditches with diverse flora but minimal emergent vegetation.

Table 50a. Little whirlpool ramshorn snail measures

Primary measure	Primary measure details
Habitat Creation and Management	Create new habitats, including ditch systems, and remove fish species such as carp that increase turbidity.

Table 50b. Little whirlpool ramshorn snail other relevant measures

Other relevant measures	Other relevant measures details
Population Establishment	Establish additional populations within large wetland ecosystems, including through translocation.
Agricultural Management	• Manage drainage and irrigation operations and associated infrastructure to minimise impacts. • Reduce diffuse pollution entering surface or groundwater from agricultural activities.
Transport Impact Reduction	Mitigate the impacts of transport operations and infrastructure on surrounding ecosystems, aiming to manage and divert run off to minimise impacts on ditches alongside routes. Examples include installation of buffer strips, barriers, silt traps, increased planting of appropriate species and bund creation.

Little whirlpool ramshorn snail continued

These measures could offer solutions to address pressures in:

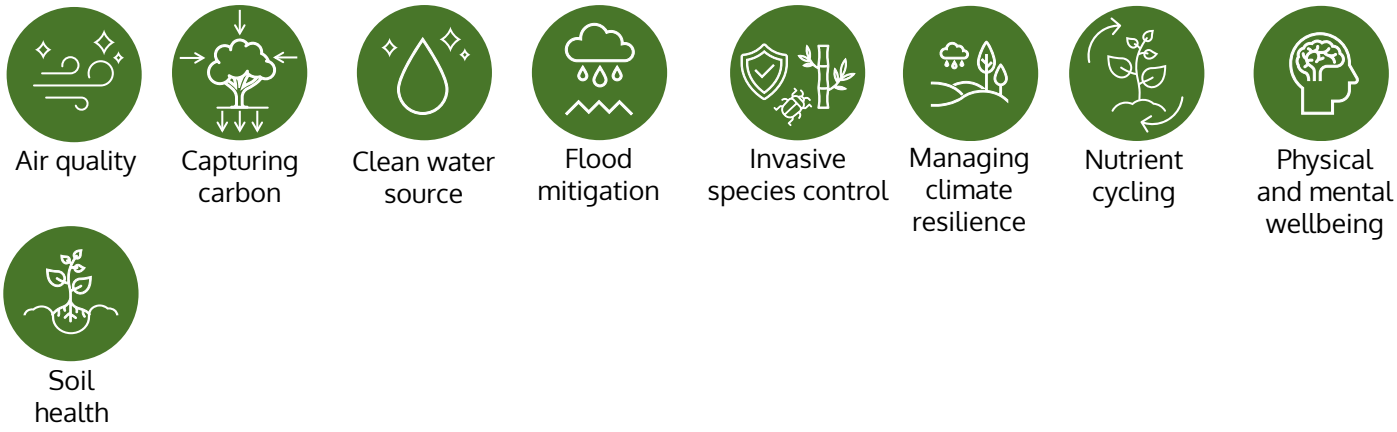
- Coastal
- Farmland
- Freshwater

Other linked assemblages that would benefit from these measures are:

- Still waters
- Reedbeds and Freshwater Wetlands
- Lowland Fen

The mapped measures for wet grassland [PM45 - 48] and appropriate river and ditch habitat measures [PM49] are potentially relevant for Little whirlpool ramshorn snail.

These measures are considered to support the following co-benefits:



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Narrow-mouthed whorl snail

Orgyia recens

Narrow-mouthed whorl snails are typically found in calcareous wetlands bordering lakes, rivers, or fens, with calcareous fen being the species' most common habitat. Due to its specific microhabitat requirements, the species is often confined to a narrow zone around wetlands, spanning only a few metres in width.

Table 51a. Narrow-mouthed whorl snail primary measure

Primary Measure	Primary measure details
Habitat Improvement	Prevent afforestation to maintain open habitat conditions suitable for the species.

Table 51b. Narrow-mouthed whorl snail other relevant measures

Other relevant measures	Other relevant measures details
Habitat Maintenance	• Avoid drainage and implement re-wetting strategies to preserve wetland areas. • Use controlled grazing techniques to manage vegetation and sustain habitat quality.
Water Pollution Mitigation	Address eutrophication, a primary threat to the species, which degrades water quality in coastal seepages. Reduce nutrient runoff to prevent further deterioration.

Narrow-mouthed whorl snail continued

These measures could offer solutions to address pressures in:

- Farmland
- Freshwater

Other linked assemblages that would benefit from these measures are:

- Still waters
- Reedbeds and Freshwater Wetlands
- Rivers and riverside habitats
- Lowland Fen

The mapped measures for unmanaged habitat including wet grassland [PM45-48], fen and wetland [PM57-59] alongside coastal ditches [PM63-65] are potentially relevant for narrow-mouthed whorl snail.

These measures are considered to support the following co-benefits:

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Natterjack toad

Epidalea calamita

Suitable habitat for Natterjack toads is characterised by bare or low, sparse vegetation with little to no scrub, shallow warm waters, and early successional stages. Also found in acid grassland and heathland habitats. Found in open coastal areas with small to medium ponds and upper saltmarshes influenced by freshwater inflows.

Table 52a. Natterjack toad primary measure

Primary Measure	Primary measure details
Targeted Species Recovery Action	• Improve or create links to suitable habitats, such as warm, open coastal dunes, between known populations in close proximity. • Create new habitats in advance of any works. • Enhance existing habitats by reducing pond vegetation (eg algae) or desilting ponds post-works. • Remove shading from water bodies. • Increase the number of ephemeral water bodies. • Provide hibernation shelters, such as appropriate walls or south-facing sandy slopes. • Remove scrub from around breeding ponds. • Minimise vegetation in ponds. • Maintain terrestrial habitats by grazing to keep grass short. • Avoid stocking fish in ponds created for amphibians. • Avoid creating new physical barriers, such as fences, walls, or vertical ditches.

Table 52b. Natterjack toad other relevant measures

Other relevant measures	Other relevant measures details
Landscape Habitat Creation, Expansion, and Connectivity	This species faces a declining range due to factors such as climate change, water pollution, and human development. Prioritising habitat creation and expansion is essential to support existing and new populations, ensuring ongoing recovery.
Enhancement of Existing Habitat near Protected Sites	All Natterjack sites in England are located within or near SSSI sites. Improving the areas around those protected sites is critical to preventing further decline and aiding recovery.
Collaborative Initiatives for Habitat Restoration	Collaborate with initiatives such as Countryside Stewardship and ELMs to create, restore, connect, and enhance habitats on a landscape scale.

Natterjack toad continued

These measures could offer solutions to address pressures in:

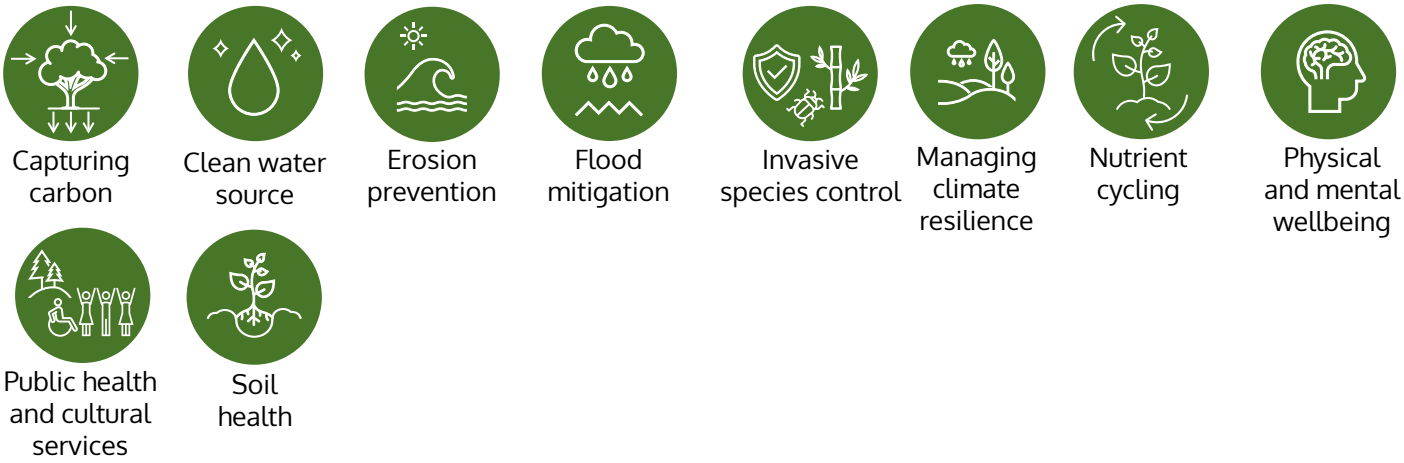
- Coastal
- Farmland
- Woodland
- Trees and Scrub
- Freshwater
- Urban and Built
- Invasive Species and Diseases

Other linked assemblages that would benefit from these measures are:

- Still waters
- Coastal Shingle and Dunes
- Saltmarshes and Lagoons
- Acid Grassland and Heathland

The mapped measures for heathland [PM27-29], saltmarsh and sand dune [PM63 - 65], including unmapped measures, are potentially relevant for natterjack toads.

These measures are considered to support the following co-benefits:



Northern pool frog

Pelophylax lessonae

Northern pool frogs are found in two habitat types:
Aquatic Habitat: Medium-sized, unshaded permanent ponds with high invertebrate abundance and diverse vegetation structure. Greater pool frog populations are associated with improved dragonfly diversity.

Terrestrial Habitat: Semi-natural areas with some cover, including rough grass and low scrub. Woodland is suitable, provided it does not overshade the pond.

Table 53a. Northern pool frog primary measure

Primary Measure	Primary measure details
Reintroduction Project: Thompson Common	The ongoing reintroduction project focuses on improving and expanding suitable habitats to benefit this species. Additional efforts include the restoration of pingo habitats.

Table 53b. Northern pool frog other relevant measures

Other relevant measures	Other relevant measures details
Habitat Creation, Expansion, and Connectivity	A priority is to maintain and expand the species' range through natural colonisation or reintroduction. Successful outcomes rely on habitat creation, improved connectivity, and restoration.
Enhancement of Existing Habitat	Current populations are limited to two locations. Enhance existing sites and new sites should be identified where vegetation structure can be diversified to provide appropriate habitat.
Collaborative Initiatives for Habitat Restoration	Collaborate with initiatives such as Countryside Stewardship and ELMs to create, restore, connect, and enhance habitats on a landscape scale.

Northern pool frog continued

These measures could offer solutions to address pressures in:

- Farmland
- Woodland
- Trees and Scrub
- Freshwater

Other linked assemblages that would benefit from these measures are:

- Native woodland
- Still waters

The mapped measures for a highly specific mixture of terrestrial and aquatic habitats PM45-48] are potentially relevant for nothern pool frogs.

These measures are considered to support the following co-benefits:

One-grooved diving beetle

Bidessus unistriatus

The one-grooved diving beetle is found in ponds, pingos, and shallow silt ponds with low nutrient levels. These habitats are typically unvegetated, providing ideal conditions for this species.

Table 54a. One-grooved diving beetle primary measure

Primary measure	Primary measure details
Pond Creation	Establish ponds within the species' current or historical distribution in heathland and fen sites as part of restoration management. Locate ponds in low-intensity catchments to limit nutrient inputs. Design ponds with shallow basins and broad margins.

Table 54b. One-grooved diving beetle other relevant measures

Other relevant measures	Other relevant measures details
Grazing Management	• Maintain ponds with low-intensity grazing using cattle, ponies, or deer. • Avoid overgrazing or undergrazing, which can harm the habitat. • Ensure trampling does not remove all vegetation from the pond while using low livestock densities to maintain bare mineral substrates in soft sediments.
Scrub Removal	• Remove scrub periodically to keep sites open and prevent over-shading. • Excessive scrub can reduce water temperatures and eliminate submerged vegetation, threatening the beetle's habitat.
Population Introduction	• Consider introducing the species to new, suitable sites due to its rarity. • Take care not to harm existing populations by removing individuals for captive breeding, as this approach has been unsuccessful to date.

One-grooved diving beetle continued

These measures could offer solutions to address pressures in:

- Farmland
- Freshwater

Other linked assemblages that would benefit from these measures are:

- Still waters

The mapped measures for still water habitats, where appropriate, [PM54 - 55] are potentially relevant for one-grooved diving beetles.

These measures are considered to support the following co-benefits:

Orange-fruited elm lichen

Caloplaca luteoalba

Orange-fruited elm lichen is a species associated with well-lit, dry trees with rough, basic bark. It typically occurs on bark or exposed lignum, particularly in the wound tracks of old, injured trunks in parklands. It is usually found near the base of the trunk, where the bark or wood is enriched with nutrients. Occasionally, it can also be found on soft, calcareous stone (eg chalk pebbles) or mortar.

Before Dutch Elm Disease, elm was its primary host tree. In recent years, it has occasionally been recorded on sycamore, field maple, and ash.

Table 55a. Orange-fruited elm lichen primary measures

Primary Measure	Primary measure details
Land Management Techniques	• Manage veteran and ancient trees to benefit this species. • Identify younger suitable trees (eg field maple, sycamore, disease resistant elms) to serve as future veteran replacements, ensuring light conditions meet the species' requirements. • Where suitable trees are absent, plant future veteran trees near existing populations but not so close as to cause shading or competition issues. • Allow successive generations of trees to age naturally, enabling natural damage to create niches. • Plant disease-resistant elm to support population recovery.

Table 55b. Orange-fruited elm lichen other relevant measures

Other relevant measures	Other relevant measures details
Habitat Restoration and Enhancement	• Implement positive woodland management to maintain open conditions around host trees and create glades. • Reintroduce sensitive grazing to control shrub encroachment and maintain suitable light levels.

Air Pollution Reduction and Mitigation	• Reduce locally generated atmospheric pollutants by:
	  ○ Lowering excessive stocking levels.
	  ○ Limiting fertilisation of nearby grasslands.
	• Ensure wayside trees are free from fertilisers, manure, and slurry through agri-environment schemes (JNCC, 2010).

Orange-fruited elm lichen continued

These measures could offer solutions to address pressures in:

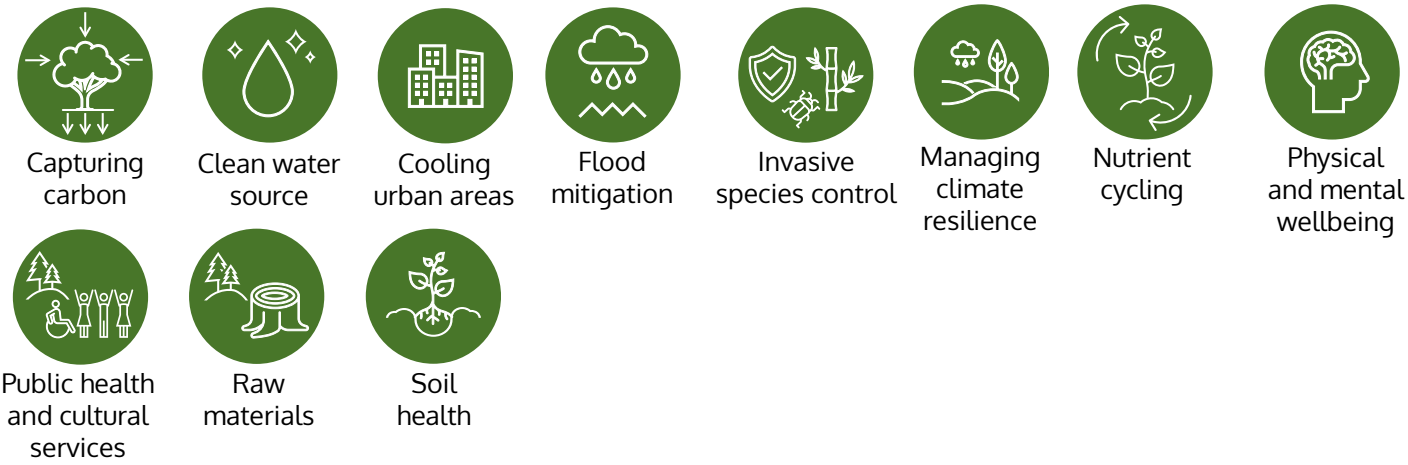
- Farmland
- Woodland
- Trees and Scrub
- Urban and Built
- Invasive Species and Diseases

Other linked assemblages that would benefit from these measures are:

- Native trees
- Trees outside of woodlands

Mapped specific woodland planting schemes [PM01 - 04] and measures for veteran trees [PM09 - 13] are potentially relevant for orange-fruited elm lichen.

These measures are considered to support the following co-benefits:



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Scarce vapourer

Orgyia recens

Scarce vapourer typically occurs in lowland sandy heaths, wet woodlands, fens, bogs, and hedgerows. The species is reliant on barberry plants.

Table 56a. Scarce vapourer primary measure

Primary Measure	Primary measure details
Hedgerow Management	• Manage hedgerows on a rotation of at least three years to maintain biodiversity and habitat health. • Avoid managing all hedgerows on a site within the same year. • Undertake management in sections, ensuring cuts or trims are distributed across the hedgerow.

Table 56b. Scarce vapourer other relevant measures

Other relevant measures	Other relevant measures details
Translocation/ Reintroduction	Introduction of populations to appropriate habitat areas.
Planting of Habitat Trees	Ensure planting of deciduous trees such as hawthorn, pedunculate oak, and sessile oak, which serve as essential feeding sites for larvae during the winter months.

Scarce vapourer continued

These measures could offer solutions to address pressures in:

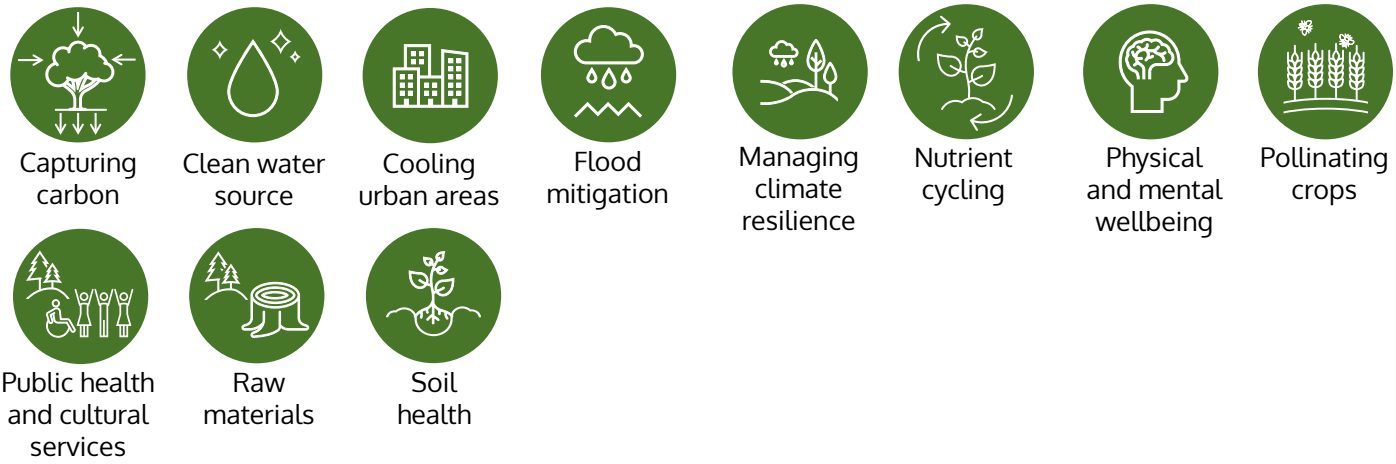
- Farmland
- Woodland
- Trees and Scrub
- Grassland and Heathlands

Other linked assemblages that would benefit from these measures are:

- Farmed Landscapes
- Acid Grassland and Heathland Native Woodland
- Lowland Fen

Varied mapped habitat measures across arable, grassland, hedgerow, woodland and fen landscapes [PM01 - 08, PM21 - 23, PM27 - 48; PM57 - 59] are potentially relevant for scare vapourer.

These measures are considered to support the following co-benefits:



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Serotine bat

Eptesicus serotinus

The serotine bat prefers building roosts and forages in open areas across diverse habitats, such as woodland edges, small-scale farmland, over lakes and rivers, and around streetlights. Benefits from organic, cattle-grazed pasture.

Table 57a: Serotine bat primary measure

Primary Measure	Primary Measure details
Habitat Restoration and Enhancement: Creation of Corridors	Artificial lighting at night can form a barrier to movement across the landscape. Therefore, it is important to reestablish, enhance and/or create new 'dark commuting corridors' of appropriate habitat between roosting and foraging areas. In contrast, artificial illumination should be provided if necessary in foraging areas, to maximise feeding opportunities.

Table 57b: Serotine bat other relevant measures

Other relevant measures	Other relevant measures details
Habitat Restoration and Enhancement: Role of Grazing Land and Feeding Habitat	• This species benefits from organic livestock management practices, including winter grazing, particularly in the absence of anthelmintic treatments (eg ivermectin). • Provision of a variety of improved feeding habitats where large invertebrates can be found eg creation of woodlands and hedgerows, riparian planting and enhancement of aquatic areas to ensure year round provision.

Serotine bat

These measures could offer solutions to address pressures in:

- Farmland
- Woodland
- Trees and Scrub
- Grassland and Heathlands
- Urban and Built

Other linked assemblages that would benefit from these measures are:

- Native Woodland
- Trees Outside of Woodlands
- Urban, Built and Garden Environments
- Farmed Landscapes
- Lowland Measures and Pastures

The mapped potential measures which focus on the creation of varied habitat types and increased connectivity, in addition to associated unmapped measures in urban and built landscapes, are potentially relevant for the serotine bat.

These measures are considered to support the following co-benefits:

Starlet sea anemone

Nematostella vectensis

Starlet sea anemone are found in isolated or semi-isolated brackish pools within saltmarshes and lagoons, as well as in ditches and on mudflats in saltmarshes and shallow estuaries at or above the high-water mark. Typically associated with mud, muddy sand, and muddy shingle, but can also occur on vegetation.

Table 58a: Starlet sea anemone primary measure

Primary Measure	Primary measure details
Habitat Creation and Connectivity	• Reduce the isolation of brackish pools to minimise habitat fragmentation and enhance ecological connections. • Promote natural processes to ensure lagoon formation is facilitated and shingle barriers remain as a protective barrier.

Table 58b: Starlet sea anemone other relevant measures

Other relevant measures	Other relevant measures details
Habitat Restoration and Protection	• Maintain and enhance lagoons and other sheltered brackish water habitats. • Mitigate damaging factors, including pollution and drainage, to ensure long-term habitat viability. Promote alternative run off pathways and sustainable agricultural practices to minimise salinity changes.
Translocation	Relocate individuals to expansive, unmanaged open marshes free from human influence, allowing for natural population spread and sustainability.

Starlet sea anemone continued

These measures could offer solutions to address pressures in:

- Freshwater
- Coastal

Other linked assemblages that would benefit from these measures are:

- Saltmarshes and Lagoons
- Coastal shingle and dunes

The habitat measures that have been mapped within coastal habitats [PM63-68] are additionally potentially relevant for starlet sea anemone.

These measures are considered to support the following co-benefits:

Starry Breck Lichen

Buellia asterella

Lowland calcareous grasslands, typically found on dry, basic soils (terricolous), often associated with *Fulgensia fulgens*. This habitat is very localised and in decline, historically recorded in Eastern England, including East Anglia. In recent decades, it has been located within open stony (flinty) and sandy grasslands in the Brecks.

Table 59a: Starry Breck Lichen primary measure

Primary Measure	Primary measure details
Targeted Species Recovery Action	• Land/Water Management: ○ Restore degraded habitats and ecosystem functions via grazing techniques, use of green-hay and appropriate seed sowing, alongside planting of appropriate seedlings or mature plants. ○ Monitor air pollution levels prior to reintroduction to maximise success.

Table 59b: Starry Breck Lichen other relevant measures

Other relevant measures	Other relevant measures details
Targeted Species Recovery Action	• Land/Water Protection: ○ Establish or expand protected areas using appropriate techniques. • Land/Water Management: ○ Manage protected areas and other resource lands.

Starry Breck Lichen continued

These measures could offer solutions to address pressures in:

- Farmland
- Woodland
- Trees and Scrub
- Grassland and Heathlands

Other linked assemblages that would benefit from these measures are:

- Brecks grass heath
- Chalk grassland

The habitat measures that have been mapped within specific locations of calcareous grassland [PM37 - 40] are potentially relevant for starry breck lichen.

These measures are considered to support the following co-benefits:

Suffolk lungwort

Pulmonaria obscura

Suffolk lungwort is an understorey plant typically found in woodlands, growing beneath the main canopy of trees. The understory consists of smaller trees, shrubs, and herbaceous plants that thrive in the dappled light and sheltered conditions provided by the overhead canopy. It is also found in rides and areas of coppiced woodland.

Table 60a: Suffolk lungwort primary measure

Primary measure	Primary measure details
Species-Specific Action	• Continue coppice management to maintain suitable habitat conditions. • Employ developed plant propagation techniques and establish re-introduced populations at appropriate locations.

Table 60b: Suffolk lungwort other relevant measures

Other relevant measures	Other relevant measures details
Landscape Habitat Creation, Expansion, and Connectivity	• Improve woodland connectivity to link fragmented habitats. • Buffer existing sites to enhance their ecological resilience.

These measures could offer solutions to address pressures in:

- Farmland
- Woodland
- Trees and Scrub

Other linked assemblages that would benefit from these measures are:

- Native woodland
- Trees outside of woodland

The habitat measures that have been mapped within woodlands to create appropriate habitat and buffer zones [PM01 - 04] are potentially relevant for suffolk lungwort.

These measures are considered to support the following co-benefits:

Capturing carbon

Managing climate resilience

Nutrient cycling

Physical and mental wellbeing

Raw materials

Soil health

Water vole

Arvicola amphibius

Watervoles can be found in coastal floodplains, lowland fens, reedbeds, raised bogs, lakes, ponds, rivers, and chalk rivers. The species favours riparian habitats, including streams, ditches, rivers, canals, reedbeds, and upland systems. Optimal habitats have slow-flowing water and densely vegetated banks 2–5 metres from the water's edge.

Table 61a: Water vole primary measure

Primary measure	Primary measure details
Management of Problematic Invasive Species: Mink Control	• Monitor mink occurrence and maintain monitoring of to ensure they do not recolonise from other counties, to mitigate their impact on native wildlife. • Coordinate sustained efforts with landowners to eradicate mink across large landscapes and river catchments. • Use appropriately designed mink rafts for effective monitoring and humane trapping. Remote devices can manage multiple rafts efficiently across wide areas.

Table 61b: Water vole other relevant measures

Other relevant measures	Other relevant measures details
Habitat Restoration and Enhancement: Restore watercourses and marginal vegetation to their natural state.	Sympathetic Management of River Banks: ○ Fence buffer zones (2m+) from water's edge to reduce trampling. ○ Provide off-stream watering points. ○ Manage trees and scrub to avoid excessive shading and support diverse vegetation. ○ Rotate bankside cutting every two years (or longer), leaving one bank uncut. Cut from late September. ○ De-silt ditches every five years, avoiding damage to fragile banks.
Habitat Creation, Expansion, and Connectivity: Create waterbodies with marginal vegetation to enhance habitat.	Increase Water Vole Habitat: ○ Establish grassy buffer strips (4-6m) along watercourses, ditches, and ponds, particularly near intensive farmland. ○ Remove artificial bank revetments to support burrowing and vegetation growth. ○ Restore or create wetlands (ponds, scrapes, ditches) linked to existing habitats to promote movement.
Hydrology Restoration on Protected Sites	Remove land drainage to raise water table levels and restore natural hydrology.
Water Pollution Reduction and Mitigation	Reduce water pollution and eutrophication, which harm water voles through contamination and habitat degradation

Water vole continued

These measures could offer solutions to address pressures in:

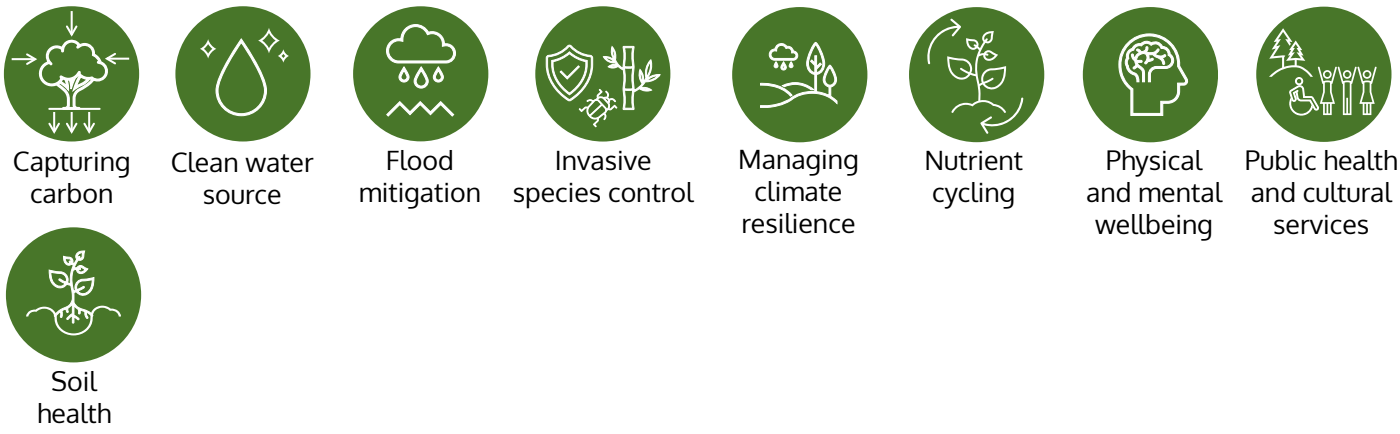
- Farmland
- Woodland
- Trees and Scrub
- Freshwater

Other linked assemblages that would benefit from these measures are:

- Still Waters
- Rivers and Riverside Habitats
- Lowland Fen
- Reedbeds and Freshwater Wetlands

The habitat measures that have been mapped within freshwater wetland, fen, reedbed and riparian areas [PM49-62] are potentially relevant for water voles.

These measures are considered to support the following co-benefits:



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White-clawed crayfish

Austropotamobius pallipes

White-clawed crayfish are found in lakes, ponds, rivers, chalk rivers, and potentially brownfield sites. Prefers clean water with abundant refuges such as tree roots, rocks, and stable riverbanks. Thrives in clean aquatic habitats, particularly hard-water streams and rivers, but may also inhabit canals, reservoirs, lakes, and water-filled quarries.

Table 62a: White-clawed crayfish primary measure

Primary Measure	Primary Measure details
Habitat Creation and Creating In-Water Refuges	Establish trees such as alder and willow along riverbanks to create shaded areas and exposed root systems suitable for crayfish colonisation. Place cobbles, boulders or wood along riverbanks and margins to provide shelter.

Table 62b: White-clawed crayfish other relevant measures

Other relevant measures	Other relevant measures details
Catchment Management	Maintain high levels of water quality and improve water quality by implementing buffer strips, restricting cattle access, and other sustainable practices.
Captive Breeding Programme	Support population recovery through captive breeding initiatives, establishing ark sites to maintain the number of populations.
Population maintenance	Explore techniques for the active management and removal of invasive species to help safeguard populations within historical range and promote or apply appropriate biosecurity measures. Refer to the Crayfish Conservation Manual as required [26].

White-clawed crayfish continued

These measures could offer solutions to address pressures in:

- Freshwater
- Woodland
- Trees and Scrub
- Invasive Species and Diseases

Other linked assemblages that would benefit from these measures are:

- Still Waters
- Rivers and Riverside Habitats

The habitat measures that have been mapped within freshwater habitats, but specifically chalk streams and rivers, including ark habitat sites [PM49 - 56] are potentially relevant for white-clawed crayfish.

These measures are considered to support the following co-benefits:

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Witham orb mussel

Sphaerium solidum

Fens and wetlands provide essential habitats for witham orb mussels, offering clean, slow-flowing water and suitable substrates for attachment and breeding.

Table 63a: Witham orb mussel primary measure

Primary Measure	Primary measure details
Removal of invasive species	Remove invasive species from habitats to restore ecological balance and protect native species.

Table 63b: Witham orb mussel other relevant measures

Other relevant measures	Other relevant measures details
Habitat enhancement and connectivity	Enhance existing habitats and improving connectivity between fragmented areas via creation of new areas, therefore supporting species movement and resilience.

These measures could offer solutions to address pressures in:

- Farmland
- Freshwater
- Invasive Species and Diseases

Other linked assemblages that would benefit from these measures are:

- Lowland Fen
- Reedbed and Freshwater wetlands

The habitat measures that have been mapped within freshwater habitats, [PM47 - 59] are potentially relevant for witham orb mussel.

These measures are considered to support the following co-benefits:

Capturing carbon

Clean water source

Flood mitigation

Invasive species control

Managing climate resilience

Nutrient cycling

Physical and mental wellbeing

Public health and cultural services

Soil health

Species recovery: Fen Raft Spider translocation programme

The Fen Raft Spider, *Dolomedes plantarius,* is listed as Vulnerable to extinction on the global and British Red Lists. Translocation is one element in its national recovery programme, aiming to reduce the extinction risk of this large, elegant and superbly adapted wetland spider by increasing the number of populations from three natural remnants to at least twelve.

Who's involved?

- Natural England (instigator, and host to one new population)
- Suffolk Wildlife Trust (donor population, and host to two new populations)
- Sussex Wildlife Trust (donor population)
- RSPB (host to one new population)
- BIAZA (13 British Zoos and Collections contributed to captive rearing work in 2011-13)

Funding contributions came from Natural England, the Broads Authority, the BBC Wildlife Fund, Love the Broads, Suffolk Wildlife Trust and RSPB.

Research was undertaken by PhD and Masters students at The Universities of East Anglia and Nottingham.

Hundreds of volunteers have monitored the populations on behalf of the project and host sites managers.

What have they achieved?

The number of Fen Raft Spiders populations in Britain has increased from three to seven since 2010, substantially reducing the threat of extinction.

Translocations have focussed on the Broads where new populations now thrive on river-side grazing marshes on a 5km stretch of the lower River Waveney, a 6 km stretch of the mid-Yare, and 2km of the Thurne.

Fen Raft Spider

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Volunteers training to monitor new Fen Raft Spider populations

How do they do it?

The programme followed international (IUCN) guidelines for conservation translocations. Each potential site we evaluated for over 3 years and assessed the genetics of the source population.

The first three translocation sites were populated with spiders from remnant populations at Redgrave and Lopham Fen, Norfolk, and the Pevensey Levels, East Sussex.

The Redgrave and Lopham Fen population was very small, so spiderlings were individually captive-reared for the first three months of life, greatly increasing their survival compared with that in the wild. Because spiderling survival is naturally low, the numbers introduced were large – over 30,000 across the four sites.

The first new population established so rapidly that it was able to supply the spiderlings needed for the fourth translocation; there was no longer any need to remove spiders from the natural populations or to undertake very labour-intensive captive rearing.

What's next?

The programme now includes a new phase, evaluating potential translocation sites beyond the Broads, initially in the East Anglian Fen Basin. Research on the impacts of climate change on this relatively immobile species suggests that its climatic range is shifting and that translocations are likely to remain an important element in its conservation.

Regular monitoring remains essential to understanding how the populations vary in extent and abundance between years and over longer periods. This information underpins routine site management and informs the potential need for additional interventions.

Genetic monitoring is also being introduced to help inform the most appropriate choice of parental stock for future translocations.

New research is now investigating the possibility of developing eDNA methods for monitoring this species, potentially making it much easier to detect future range changes.

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Locations of key species across Norfolk

To support identification of potential measures within the spatial strategy, data on the recorded locations of the key species, provided by NBIS (Norfolk Biodiversity Information Service) has been reviewed through the creation of the Local Habitat Map (see **Part D, Locations for Action**). The maps below demonstrate the species density (**Figure 11**) and species richness (**Figure 12**) across the county for the combined records and counts for those individuals. This data is intended to highlight the most important areas for population numbers and variety of species found, to support the identification of the areas identified for nature recovery actions.

Figure 11. Map indicating where the key species indicated in the LNRS can be found across Norfolk in terms of numbers of records.

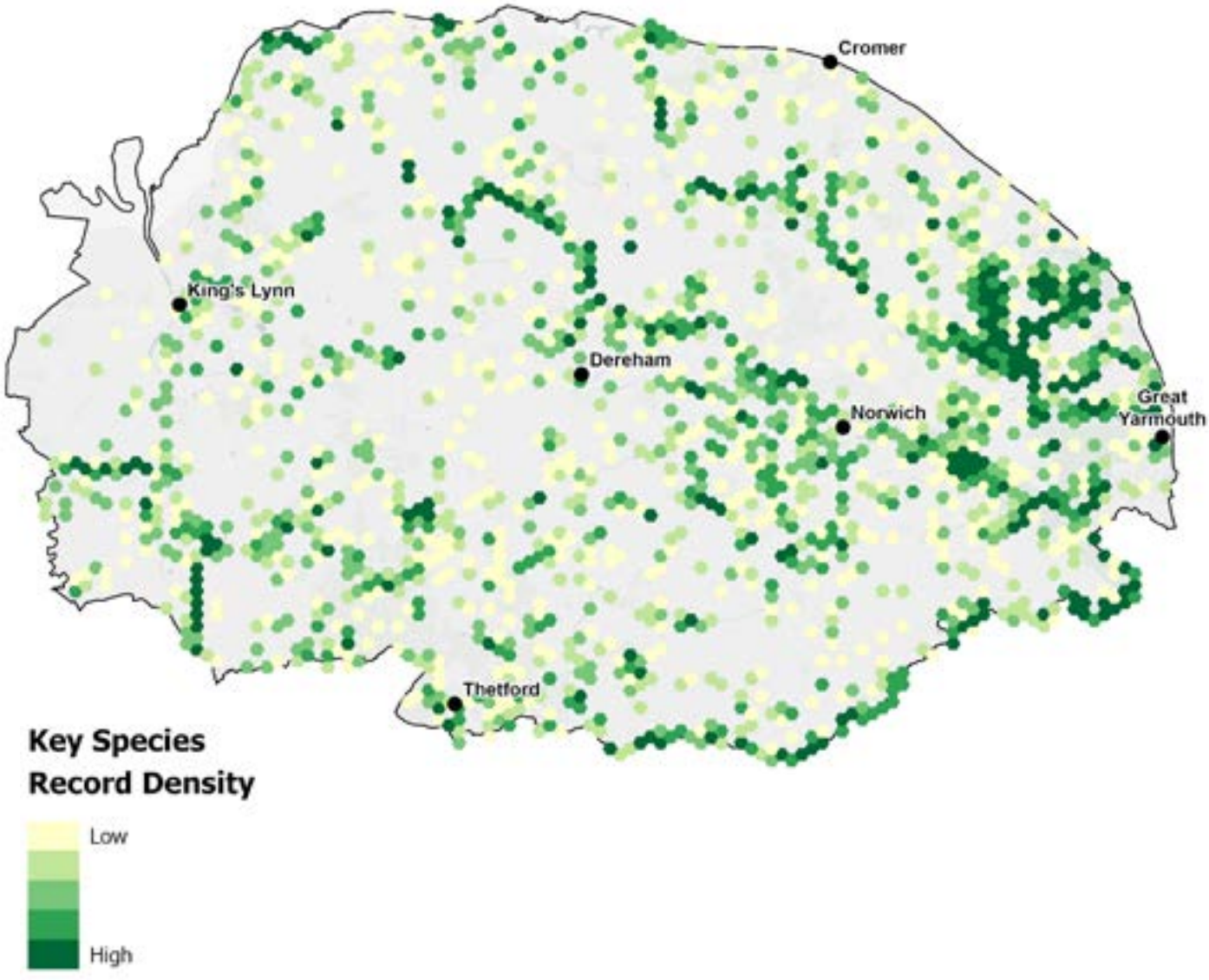

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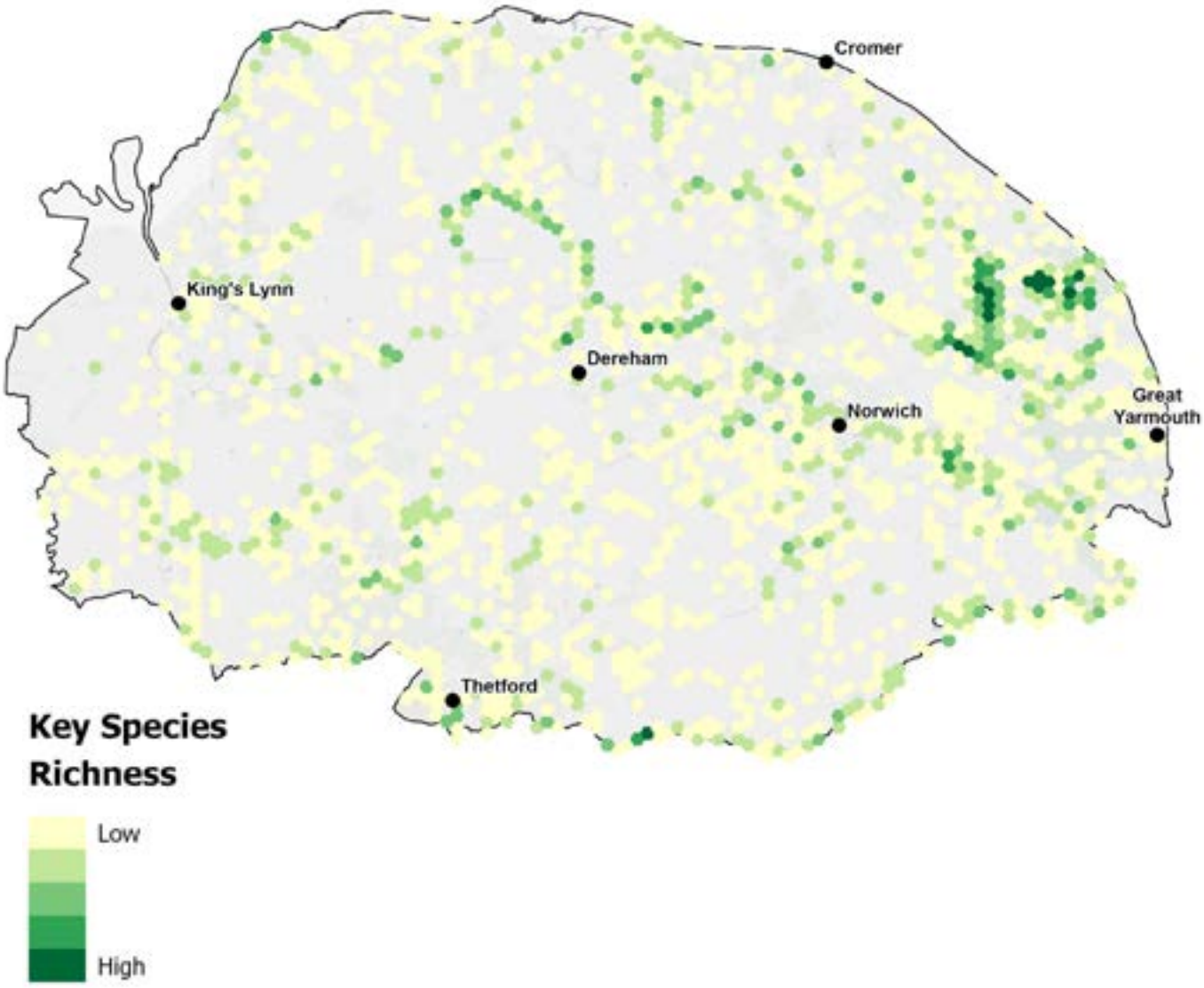
Figure 12. Map indicating how many of the key species indicated in the LNRS can be found in locations across Norfolk – the species richness.



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Wider priorities

Some measures are not specifically designed to create or enhance habitats, and therefore **Table 64** identifies Wider Priorities designed to apply widely across locations, stakeholders and land parcels. These link to key spatial, environmental or nature-based processes which do not have a defined location focus. These can be adopted across the county to bolster the specific actions determined within the species and habitat prioritisation process, creating benefits across ecosystems.

Table 64. Wider Priorities

Priority Outcomes	Relevant potential and existing measures/actions/projects for on the ground delivery
Reduce impacts on nature from pesticide use (including insecticides, herbicides and fungicides)	Promote the reduced, targeted, and responsible use of pesticides (insecticides, herbicides, and fungicides) in farms, parks, streets, and gardens.
Reduce flood risk through nature based solutions	• Use of SuDS where appropriate, including reedbeds, green roofs, swales, rain gardens, permeable paving, water butts etc. • Re-connect river channels with their floodplains. • Slow down overland flows through woodland and meadow creation. • Leave wood debris in the upper reaches of river channels to slow flood flows.
Reduce air pollution pressures on nature from all sources	• Promote reduced emissions of damaging air pollutants from all sources. • Use of shelterbelts of trees to reduce nitrogen and filter out particles from the air.
Reduce water pollution pressures on nature from all sources	• Reduce emissions of damaging water pollutants from all sources. • Deliver Nutrient Neutrality in appropriate areas. • Raise community awareness about catchment management, including septic tanks and domestic treatment plants. • Benefit the marine environment by improving the quality of the freshwater entering it.
Reduce water use pressures on nature from all sources	• Promote reduced water use from all sources. • Restore sustainable water abstraction across catchments. • Improve storage of water during winter months so it can be used in the summer to reduce the need for abstraction from water courses and from groundwater.

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Wider priorities continued

Table 64. Wider Priorities continued

Sub-Priority	Relevant potential and existing measures/actions/projects for on the ground delivery
Reduce recreational pressures on nature from all sources	• Promote responsible recreational practices (with links to strategic solutions mitigating impacts on sensitive sites eg Norfolk GIRAMS). • Manage areas around campsites and recreational infrastructure using lower-impact silvicultural systems for amenity value. • Reduce light pollution and promote dark skies. • Encourage schemes to promote protection of nesting birds, especially in coastal areas. • Reduce light pollution from recreational sources and promote dark skies. • Provision of 'Suitable Alternative Natural Greenspaces' (SANG) close to where people live in order to decrease recreational pressures on more sensitive sites for nature.
Improving soil quality in all areas	• Implement sustainable agroforestry, horticultural and agricultural practices. • Keep soil covered throughout the year using cover crops. • Preserve and improve soil structure via minimum tillage. • Avoid soil compaction. • Increase or maintain soil organic matter.
Creating large scale mosaic habitats	Implement habitat creation in terms of continuous and dynamic mosaics of at least 100 hectares (ideally approximately 5000 to 12000 hectares) in any location, not specifically those identified in the ACB. Follow recommendations in the Nature Networks Evidence Handbook [27].

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Wider priorities continued

These measures could offer solutions to address pressures in:

- Coastal
- Farmland
- Woodland, Trees and Scrub
- Freshwater
- Grassland and Heathlands
- Urban and Built
- Invasive Species and Diseases

These measures are considered to support the following co-benefits:

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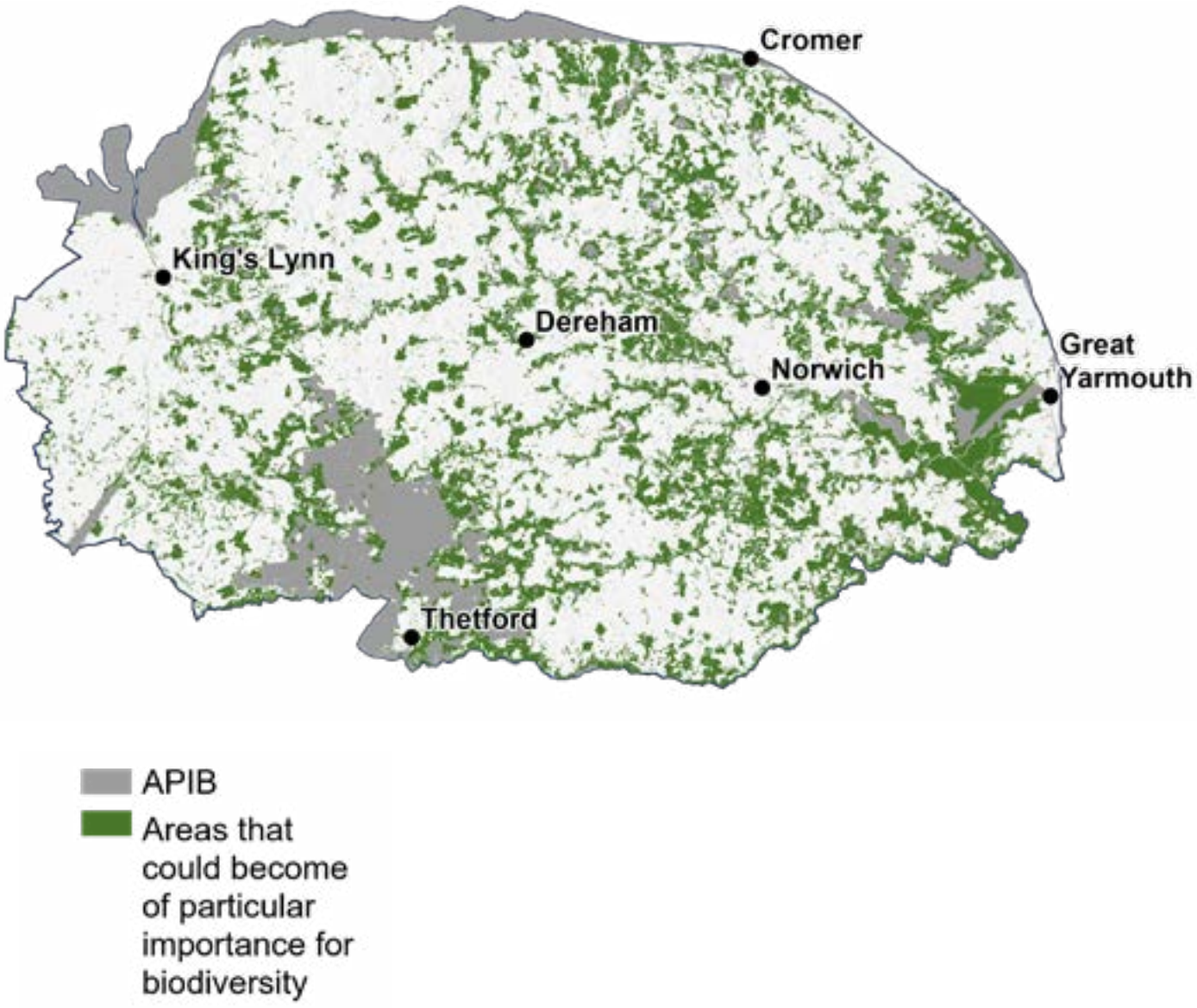
Part D: Locations for Action

Salthouse Marshes

Where possible, the potential measures from the Statement of Biodiversity Priorities have been mapped onto the **LNRS Local Habitat Map**. Those which are mapped are indicated within the table in **Part C**, **Norfolk's Priority Habitats, Assemblages and Species**. The purpose of mapping the measures is to create a shared vision of locations where habitat action could be focused by landowners, local people and organisations to create a connected network of nature and achieve the local biodiversity priorities. Whilst many measures could be carried out in a variety of locations, the map shows the locations where these measures could have the greatest impact on achieving the priorities and would achieve greater connectivity of biodiverse habitats across the landscape. These sites require verification before projects are implemented, as detailed in **Part C**. A summary map of those areas identified that could become of particular importance for biodiversity (ACB) is given in **Figure 13**.

Figure 13. Norfolk's Areas that Could Become Particular Importance for Biodiversity.



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Spatial analysis has been used to identify these landscape level priority areas based on the Lawton principle of more, bigger, better and more joined. Whole land parcels within the landscape have been selected as priority 'in scope' areas for the mapping of appropriate measures. These mapped measures also indicate where wider environmental benefits will be recognised using nature-based solutions delivering for example, flood risk mitigation and improved water quality. By mapping specific locations to take such actions, the LNRS aims to drive delivery, and funding towards achieving nature recovery in these areas. All mapping methodology is outlined in **Appendix 4**.

As part of the analysis of the mapping data, it has been possible to identify the proportions across the districts in the county that are already designated (APIB) and those which are areas that could become of importance (ACB). This is shown in **Table 65**. This analysis has also identified that the mapped measures indicated within this LNRS have the potential to allocate 31% of the county in total to nature recovery activities.

It has also been possible to determine the allocation across mapped habitat priority areas, supporting the ecological demand of the landscape. This also links to the output of engagement activities, reflecting which habitats are important to demonstrate the ambition and potential of the LNRS. These data are shown in **Table 66**.

Table 65. Proportions of Norfolk districts allocated to APIB and ACB

District	APIB as percentage of total district area	ACB as percentage of total district area
Breckland	21%	27%
Broadland	11%	39%
Great Yarmouth	12%	30%
King's Lynn & West Norfolk	12%	24%
North Norfolk	12%	35%
Norwich	9%	20%
South Norfolk	4%	39%
Norfolk Total	**13%**	**31%**

Table 66. Proportions of Norfolk districts allocated to APIB and ACB

District	APIB as percentage of total district area
Wood pasture and parkland	0.15%
Traditional orchards	0.21%
Still water habitats	0.44%
Reedbeds	0.84%
Wet woodland	0.86%
Rivers and streams	1.00%
Scrub	1.13%
Heathland and acid grassland	1.53%
Habitats in farmed landscapes	3.16%
Fen habitats	3.36%
Wet grassland	3.42%
Mixed deciduous woodland	12.88%
Grassland – neutral and calcareous	13.98%

As indicated in the document and in the tables above, not all of the measures are mapped onto the **Local Habitat Map**. All of the potential measures detailed could be delivered across various places in the county and there is not always complete data about where all of the habitats are or could be. However, it was possible to map focused locations for delivering the majority of the measures.

As part of the engagement process, we requested input from stakeholders for suggestions of suitable locations for nature recovery actions, based on their expertise and knowledge of the area and on-going or upcoming projects. These inputs were reviewed during the production of the Local Habitat Map and have enabled some of the prioritisation of potential measures. **Table 67** indicates the proportion of these stakeholder inputs which overlap with the APIB and ACB areas presented. This aims to show that we are identifying the correct areas for potential nature recovery

Table 67. Proportion of stakeholder mapping inputs which overlap with APIB and ACB areas.

Overlap percentage	Stakeholder measures overlapping with APIB areas	Stakeholder measures overlapping with ACB areas	Stakeholder measures overlapping with APIB and ACB areas
Large (>50%)	13.9%	39.1%	46.5%
Moderate (>10%)	23.3%	40.3%	37.2%
Low (less than 10%)	62.6%	20.4%	16.1%

In addition, the species density of the key species identified through the prioritisation process was assessed in relation to the APIB and ACB areas. This data is summarised in **Table 68** below and indicates that by creating and enhancing habitat in the areas identified, these species will be able to benefit as they will have more, bigger and more connected areas to utilise.

Table 68. Species distribution in relation to identified APIB and ACB areas.

Species	Percentage of records in or within 50 m of APIB area	Percentage of records win or within 50 m of ACB area	Percentage of records in or within 50 m of APIB or ACB
Basil-thyme Case-bearer	77%	39%	98%
Crested Buckler-fern	93%	13%	99%
Crested Cow-wheat	100%	100%	100%
Dwarf Eelgrass	100%	0%	100%
Eurasian Curlew	44%	67%	78%
European Eel	41%	80%	92%
Fen Raft Spider	100%	0%	100%
Holly-leaved Naiad	92%	13%	100%
Intermediate Stonewort	100%	0%	100%
Lapwing	42%	53%	68%
Lesser Water Measurer	100%	26%	100%
Narrow-mouthed Whorl Snail	87%	87%	98%
Natterjack Toad	98%	34%	99%
Northern Pool Frog	100%	0%	100%
One-grooved Diving Beetle	83%	51%	100%
Orange-Fruited Elm-Lichen	0%	50%	50%
Ramshorn Snail	68%	68%	100%
Scarce Vapourer	77%	30%	91%
Serotine	23%	69%	75%
Starlet Sea Anemone	100%	6%	100%
Starry Breck-Lichen	100%	0%	100%
Water Vole	48%	82%	95%
White-clawed Crayfish	68%	90%	94%
Witham Orb Mussel	0%	100%	100%
Total	**46%**	**72%**	**89%**

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The unmapped measures and actions should be conducted in suitable places after a site is identified as being appropriate to achieve their relevant priorities (eg nature-friendly farming, measures for gardens, towns, and cities). The details within the LNRS are not designed to restrict nature recovery ambitions of any stakeholder, and therefore the unmapped measures are key to facilitate initiation of projects and can also provide a basis for incorporating measures focused on the improvement of existing sites, in contrast to creation of new habitat.

It is recognised that there is the potential for overlap of land areas identified for alternative uses within other documentation, for example local and neighbourhood plans. At the current time, there is limited guidance available to determine how these are integrated into the strategic opportunities. Therefore, in the context of this LNRS it is considered that by identifying areas of opportunity for nature recovery actions, factors to improve biodiversity and give wider environmental benefits within those sites can be incorporated.

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Elevating seldom-heard voices for nature recovery: Community Naturescapes

The Community Naturescapes Norfolk project is a pioneering initiative aimed at enabling grassroots community action for nature recovery across the county. It focuses on engaging seldom-heard groups in co-creating local nature recovery projects. Led by Norfolk County Council and supported by WWF-UK, the project helps communities take action to improve biodiversity and tackle climate change, targeting areas where nature can recover most effectively. Through a wide range of creative activities, the project empowers communities and amplifies their voices in shaping local environmental strategies.

Who's involved?

NCC leads the project, in partnership with WWF-UK as part of its Wholescape approach. Additional partners include community groups like English+, Independence Matters, Norfolk and Norwich University Hospital, the Wild Hub and East Norfolk Sixth Form College. A team of artists has been contracted to work directly with target groups, helping them to conceptualise and deliver nature recovery projects that reflect local priorities and perspectives.

What have they achieved?

So far, the project has successfully engaged four community groups through creative workshops and focus groups. Key achievements include:

Community Involvement
Groups such as migrants, refugees, and people with learning disabilities have been actively involved in discussing their ideas for nature recovery.

Nature Recovery Project Ideas
Groups have come up with project ideas like building bee and bug hotels, creating educational materials about nature, local nature trail maps, and community events with local farmersdesigning and fabricating creative installations which help make space for nature.

Increased Connectivity to Nature
These activities have helped participants feel more connected to their local environment and encouraged a deeper sense of responsibility for nature.

Local community engagement experts take part in a workshop which explored opportunities for engaging seldom heard groups with nature recovery.

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How do they do it?

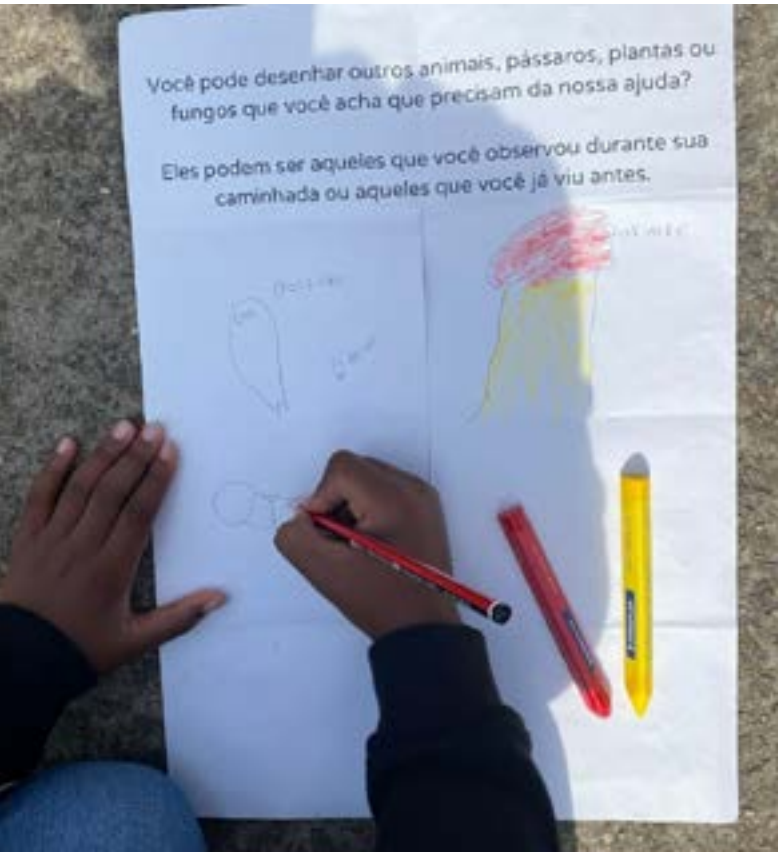
The project leverages the expertise of both environmental practitioners and artists to engage communities in innovative ways. Techniques include:

Co-Creation
Each community group works with an artist to co-create a nature recovery project tailored to their interests and needs.

Creative Pathways
These sessions use art, sound, crafting, music, and other creative outlets to explore nature recovery concepts and foster a deeper connection to the local landscape.

Participatory Methods
By involving groups in hands-on activities such as nature walks, skills-sharing sessions, and outdoor creative sessions, the project makes the concept of nature recovery accessible and engaging.

The Community Naturescapes project has seen groups start to implement their co-created nature recovery ideas with the support of artists and biodiversity experts. These pilot projects have aimed to create positive local impacts, enhancing biodiversity and fostering connections with nature. NCC and WWF-UK are using the insights gained to inform future nature recovery efforts and updates to the LNRS, ensuring community involvement remains central and inspiring long-term stewardship.



Left and right: Focus group participants taking part in guided creative nature activities.

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What are the next steps and how can you be involved?

While the LNRS itself provides a targeted, data-driven framework to prioritise nature recovery actions across Norfolk, it also recognises that everyone has a role to play. Nature recovery can happen everywhere, from private gardens and urban green spaces to farmland and community projects. By encouraging all contributions, whether through volunteer groups, schools, businesses or individual actions, the LNRS aims to inspire collective effort and show that small-scale changes are as valuable as large-scale interventions. This inclusive approach ensures the vision of nature recovery extends across the county, with the LNRS guiding and focusing efforts where they can make the greatest impact.

Throughout the engagement processes conducted in generating the LNRS, it has been clear that partners and stakeholders across the county have a high level of motivation to contribute to the process of nature recovery.

As the process moves through the necessary stages to produce the final documentation, it is essential that the views of everyone are incorporated. This will take the form of this public consultation, where responses will be collected on the documentation and the Local Habitat map produced, followed by appropriate review and incorporation of changes. Further information will be made available on the Norfolk and Suffolk Nature Recovery Partnership website, and Norfolk County Council's website.

Examples of potential involvement and opportunities generated are listed below.

For individuals, communities and groups

- Collaborative projects to promote habitat restoration and creation, wildlife monitoring and species specific actions, tree planting etc.
- Participation in citizen science projects.
- Links to the Norfolk and Suffolk Nature Recovery Partnership to maximise opportunities and information available.
- Creation of inclusive volunteer programmes to support nature recovery.

For land managers

- Adoption of defined measures for priority species and habitats where possible.
- Participation in collaborative groups eg farm clusters.
- Implementation and adjustment of appropriate land management practices and techniques, such as regenerative agriculture.
- Involvement in agri-environmental schemes or large-scale restoration projects.
- Engagement with other relevant stakeholders and providing opportunities of support where appropriate.

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For eNGOs and ecologists

- Participation in collaborative projects and facilitated partnerships to link to priority species and habitats.
- Maximise engagement with community groups.
- Provision of scientific knowledge, expertise and experience to inform and support all stakeholders.
- Promote monitoring of species and data gathering to support research and identify future nature recovery focus areas.

For businesses and the recreation sector

- Participation and support of local nature recovery projects, using a collaborative approach with other stakeholders.
- Implementation of projects on owned land.
- Promotion of local products and sustainable practices, including reduction in pollution.
- Investment in appropriate infrastructure projects.
- Supporting evidence to maximise alignment of recreational targets with nature recovery priorities – linking to appropriate access levels, promotion and land use.

For planners and developers

- Engagement with a range of stakeholders to identify contribution to nature recovery and funding schemes.
- Collaborate with appropriate bodies to maximise work both in urban and rural areas, alongside implementation and promotion of nature-based solutions.
- Link to prioritisation of key sites and habitat areas to minimise impact and maximise contribution towards biodiversity targets.
- Development of green infrastructure projects.
- Enhanced reflection of the needs of nature recovery within the spatial plans of the future as they take account of the contents of the LNRS, including plans at all scales eg Local and Neighbourhood.

As detailed above, the LNRS identifies multiple opportunities for a wide range of stakeholders, but this should not be considered to limit the scope of impact. We want the LNRS to stimulate conversations and collaborations that will deliver the nature recovery measures and actions highlighted in this strategy. The Norfolk and Suffolk Nature Recovery Partnership will maintain momentum and maximise engagement across both counties, increasing involvement with new groups, organisations and individuals.

Together, we can recover nature in Norfolk.

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Appendices

Grey Heron perched on a post in The Broads. This is one of the 842 species on the Norfolk Long List.

Appendix 1: Legislative context and analysis of existing strategies and documents

Overview

Local Nature Recovery Strategies (LNRSs) must take account of and adhere to national regulations and plans, as well as contributing to national objectives where possible.

25 Year Environment Plan

The 25 Year Environment Plan (25YEP) sets out the Government's goals for improving the environment over a 25-year period. It contains comprehensive and long-term goals to leave the environment in a better state and protect it for the next generation. Norfolk and Suffolk's LNRSs contribute to the 25YEP by considering how proposed measures can deliver additional benefits for the environment.

Environmental Improvement Plan 2023

The Environmental Improvement Plan 2023 (EIP) is the Government's delivery plan for the environment, building a green, more prosperous country. The 10 Goals of the EIP provide the overarching basis for LNRSs, which include:

- Goal 1: Thriving plants and wildlife
- Goal 2: Clean air
- Goal 3: Clean and plentiful water
- Goal 4: Managing exposure to chemicals and pesticides
- Goal 5: Maximise our resources, minimise our waste
- Goal 6: Using resources from nature sustainably
- Goal 7: Mitigating and adapting to climate change
- Goal 8: Reduced risk of harm from environmental hazards
- Goal 9: Enhancing biosecurity
- Goal 10: Enhanced beauty, heritage, and engagement with the natural environment

The Norfolk LNRS supports several of the main commitments made in the EIP 2023, such as to 'protect 30% of our land and sea for nature through the Nature Recovery Network (NRN)'. By focusing on key habitats and species to create, enhance and support across the county, the LNRS will contribute to the development of the NRN and the protection of 30% of land and sea for nature. The strategy also contributes to other commitments including providing a framework for guiding decisions around farming friendly practices, to support the goal to transform 70% of the countryside through the adoption of nature friendly farming practices. LNRSs will also contribute to climate change mitigation and adaptation, increasing carbon capture through habitat creation and providing increased opportunities for natural flood management. The strategy presents a key opportunity to engage across multiple sectors of society, providing an opportunity for individuals, organisations, businesses and others to support nature recovery, and to see the impact of their work through increased access and improved landscapes.

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Environment Act 2021

The Environment Act 2021 (EA 2021) contains legislation that will protect and enhance our environment for future generations. The Act sets out directions for cleaning up the country's air, restoring natural habitats, increasing biodiversity, reducing waste and making better use of our resources. The EA 2021 introduced Local Nature Recovery Strategies and requires these to be taken account of within the planning process.

Local context

Local Nature Recovery Strategies must reflect and support local priorities and strategies for nature recovery. To ensure local consistency, the LNRS delivery team, reviewed and analysed 301 relevant plans and strategies across Norfolk and Suffolk to draw out key policies, measures or recommendations considered relevant to delivering nature recovery for habitats and/or species. Over 1,600 existing nature recovery actions and priorities were identified from a range of sources, such as planning documents, ecological audits and management plans, among others. **Tables 69 (a - e)** gives an overview of the types and number of documents analysed.

Any additional information included in a policy, measure or recommendation, such as any specific locations, wider environmental benefits (eg improving air quality) or non-environmental co-benefits (eg improving health and wellbeing) were also recorded.

Process of analysis

As each document was reviewed, any policy, measure or recommendation outlining a specific nature recovery action for habitats and/or species was recorded. After drawing out these key nature recovery actions for habitats and/or species, each policy, measure or recommendation was translated into a 'nature recovery priority'. This allowed actions to be categorised into more specific themes based around what precisely the action is seeking to deliver. Depending on the level of detail for each action, the nature recovery priority could vary in terms of how broad or narrow its scope was.

The next stage was to assign each action/priority an overarching 'nature recovery principle', specifying whether the action/priority was targeting habitats and/or species.

Habitats were assigned a nature recovery principle based on whether the action/priority was focused on creating **more** new habitats, making existing habitats **bigger**, making existing habitats **better**, and/or making habitats more **joined-up**.

Species were assigned a nature recovery principle based on **recovering** those present, **reintroducing/translocating** those no longer present or **controlling** those present that impede nature recovery such as invasive non-native species. In some cases, an action/priority could sit under more than one principle. **Table 70** gives an example of how one action was categorised into a priority and then assigned to an overarching nature recovery principle.

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Table 69a. Type and number of planning documents analysed for nature recovery measures.

Number	Document Type
35	Local Plan documents (includes associated Green Infrastructure Strategies, Biodiversity Strategies, other nature-related supplementary planning documents, etc.)
136	Neighbourhood Plans (70 Suffolk, 66 Norfolk)
1	Network Rail Nature Strategy
1	National HighwaysNature Strategy
160	**Total planning documents**

Table 69b. Type and number of climate strategies analysed for nature recovery measures.

Number	Document Type
2	County Climate Plans/Strategies
2	**Total climate strategy documents**

Table 69c. Type and number of ecological audits, plans and strategies analysed for nature recovery measures.

Number	Document Type
3	Biodiversity Audits
43	Biodiversity Action Plans (21 Suffolk, 22 Norfolk)
2	Marine Plans
5	Internal Drainage Board Biodiversity Action Plans
16	Local tree and woodland strategies, including Community Forest plans
4	Environmental NGO Nature Recovery Strategies/lists
5	National Landscapes and National Parks Nature Recovery Plans
1	Natural Capital Evidence Compendium
12	Farm cluster strategic priority lists
95	**Total ecological audits, plans and strategy documents**

Table 69d. Type and number of management plans and strategies analysed for nature recovery measures.

Number	Document Type
5	Shoreline Management Plans
3	Flood Risk Management Plans and Strategies
1	River Basin Management Plan
6	Catchment Management Plans
5	Estuary Strategies
2	Minerals and Waste Plans
5	Water resource strategies (including water company biodiversity strategies)
95	**Total management plans and strategy documents**

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Table 69e. Type and number of guidance documents and engagement analysed for nature recovery measures.

Number	Document/Engagement Type
8	Pieces of national stakeholder LNRS guidance
258	Engagement opportunity outputs: Individual meetings, discussions etc.
266	**Total guidance documents and engagement**

Table 70. Example of action, nature recovery priority and overarching nature recovery principle.

Measure/Practical Action	Nature Recovery Priority	Overarching Nature Recovery Principle Habitats: More, bigger, better, joined up Species: Recover, reintroduce/translocate, control
Maintain the existing extent of wood pasture and parkland to ensure no net loss	Make existing wood pasture and parkland better (restore and enhance)	Better existing habitats

How the analysis fed into the wider LNRS process

Drawing out the key actions and then categorising them into specific nature recovery priorities and principles allowed for the identification of the most common themes from across the 301 documents which were reviewed. Having this data was crucial as it directly fed into the LNRS process by giving an indication as to which actions should be considered, and potentially included, in the LNRS list of measures and priorities for each county.

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Appendix 2: Methodology - Species and habitat priority generation

The draft Statement of Biodiversity Priorities was produced from a cumulation of stakeholder inputs, expert advice and defined criteria. This aimed to create the focus for those species and habitats which were geographically and ecologically relevant to the area.

On a national scale, it is important that the lists developed within this LNRS contribute towards the Government's species ambitions and environmental objectives. These are legally binding targets introduced by the Environment Act (2021) designed to:

- restore or create in excess of 500,000 hectares of wildlife-rich habitat outside of protected sites by 2042, compared to 2022 levels
- halt the decline of species abundance by 2030, ensuring abundance in 2042 is greater than in 2022, and at least 10% greater than 2030
- reduce the risk of species' extinction by 2042, when compared to 2022
- increase total tree and woodland cover from 14.5% of land area to 16.5% by 2050
- improve water quality and availability – reduce nitrogen, phosphorus and sediment pollution by at least 40% by 2038 sharing.

The LNRS must also work towards national environmental objectives (NEOs) linked to the wider targets to encourage coherent actions across England in order to recover and enhance biodiversity. These include:

- work to ensure that everyone in England lives within 15 minutes' walk of a green or blue space
- restore approximately 280,000 hectares of peatland in England by 2050
- restore 75% of our water bodies to good ecological status
- protect 30% of land and sea in the UK for nature's recovery by 2030
- support farmers to create or restore 30,000 miles of hedgerows by 2037 and 45,000 miles of hedgerows by 2050
- manage our woodlands for biodiversity, climate and sustainable forestry
- restore 75% of SSSIs to favourable condition by 2042
- ensure delivery and management of actions and policies that contribute towards our goals are suitable and adaptive to a changing climate
- make sure LNRSs include proposals for nature-based solutions which improve flood risk management where appropriate
- achieve good environmental status for our seas
- reduce emissions of nitrogen oxides by 73% and ammonia by 16% by 2030 relative to 2005 levels
- reducing the rates of introduction and establishment of invasive non-native species by at least 50%, by 2030.

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Within Norfolk and Suffolk, there are several Protected Landscapes (the Broads National Park and the National Landscape areas of Norfolk Coast, Suffolk & Essex Coast & Heaths National Landscape and the Dedham Vale National Landscape).
These areas are assigned non-statutory targets to which the LNRS will aim to align and contribute to where possible:

- restore or create more than 250,000 hectares of a range of wildlife-rich habitats within Protected Landscapes, outside protected sites by 2042 (from a 2022 baseline)
- bring 80% of SSSIs within Protected Landscapes into favourable condition by 2042
- for 60% of SSSIs within Protected Landscapes assessed as having 'actions on track' to achieve favourable condition by 31 January 2028
- continuing favourable management of all existing priority habitat already in favourable condition outside of SSSIs (from a 2022 baseline) and increasing to include all newly restored or created habitat through agri-environment schemes by 2042
- ensuring at least 65% to 80% of land managers adopt nature friendly farming on at least 10% to 15% of their land by 2030
- reduce net greenhouse gas emissions in Protected Landscapes to net zero by 2050 relative to 1990 levels
- restore approximately 130,000 hectares of peat in Protected Landscapes by 2050
- increase tree canopy and woodland cover (combined) by 3% of total land area in Protected Landscapes by 2050 (from 2022 baseline).

The interaction between these ambitions and environment targets is detailed in **Appendix 3**. The priorities identified within this process are listed against the targets to demonstrate how the strategy will link to their achievement and how this supported the prioritisation process as outlined in **Figure 14**.

Creation of Biodiversity and Habitat Priorities

The stages, processes and inputs required to generate the habitat-based priorities for Norfolk and Suffolk (illustrated in **Figure 14**) began with the analysis of 288 existing documents, including strategies, policies, and plans. In parallel, insights were gathered from themed working groups, which provided expert input such as group visions and practical measures, aligned with National Character Areas. Additionally, survey results captured stakeholder priorities from both the public and land managers.

From these three sources, approximately 1,700 actions were identified. Only those actions directly related to habitat creation or improvement were taken forward. These actions were then reviewed and collated in two ways. First, they were grouped into 20 habitat areas, with priorities mapped and linked to nature recovery principles. Second, they were sorted into 13 general priority areas, which focused on enhancing a wide range of habitats and ecological processes across the region, irrespective of location.

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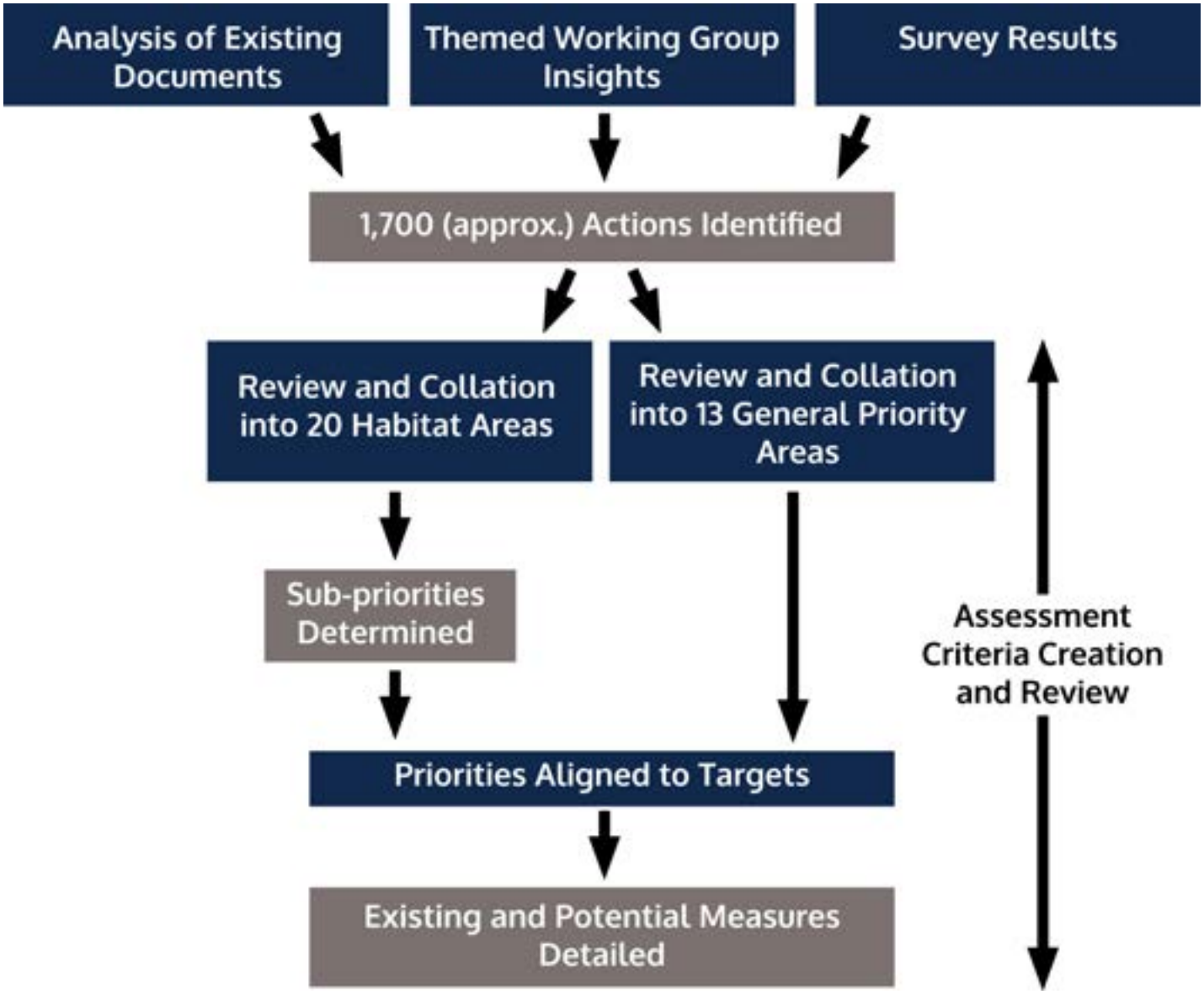
Following this, potential measures were determined, linking the actions to specific, practical activities. These priorities were then aligned to targets and assessed using a RAG (Red, Amber, Green) rating system.

Supporting existing and potential measures were detailed, including specific locations or references to relevant reviewed documents.

Throughout the process, the assessment criteria were scrutinised and tested with both the themed working groups and the steering group to ensure relevance and robustness.

Figure 14. Processes and inputs for Habitat-Based Priorities



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Species Priorities

The stages, processes, and inputs required to generate the species-based long list and short list, along with related priority measures for Norfolk and Suffolk, are outlined in the flow diagram (**Figure 15**).

The short listed species, split into key species and assemblage species are detailed in Tables **71 - 73**.

The process began with data provided by Local Record Centres (NBIS and SBIS), supported by county recorders. Species were selected based on a range of criteria, including:

- Native species assessed as Red List Threatened or Near Threatened (IUCN).
- Species likely to meet Threatened status but not formally assessed, with supporting evidence (Natural England).
- Nationally extinct species that were re-establishing or rediscovered.
- Species identified by Natural England for conservation translocation or requiring scaled-up translocation efforts for success.

Additional species inputs were drawn from:

- National Landscape and Broads Authority Strategy Focus Species
- Natural England National Character Area Priority Species Lists.

Stakeholder contributions were also gathered through public and land manager surveys, online workshops, and themed working group outputs. These were complemented by species lists from environmental NGOs, including:

- Norfolk Wildlife Trust
- Suffolk Wildlife Trust
- RSPB
- Bat Conservation Trust
- Amphibian and Reptile Conservation Trust

This was supported by a document review process which analysed approximately 300 documents.

From all these sources, more than 1,600 species were identified across Norfolk and Suffolk, creating the Long List for each county. Each inclusion was justified based on IUCN status, conservation importance, and local significance. Information and resources utilised are detailed in the reference and resources section [28 - 38]. These species then underwent individual assessment using a criteria-based system. Species progressed to the next phase only if they were supported by expert input or Natural England's Species Evidence Base.

The focus was narrowed to species with:

- IUCN status of Near Threatened or higher
- High or Medium Conservation Priority

Species were also screened for suitability under the LNRS using Natural England's Appropriate Species Action Categories, which included:

- (B) Targeted habitat management
- (C) Environmental improvements
- (D) Bespoke, complex conservation

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A shortlist of over 260 species was then quantitatively assessed and ranked. Each species was scored based on the following factors:

- **Urgency:** Risk of local extinction or need to stabilise populations.
- **Deliverability:** Feasibility of required conservation actions.
- **National Significance:** Importance of local populations for species conservation.
- **Co-benefits:** Positive impacts on other species or environmental goals (e.g. carbon storage, water management, nature engagement).
- **Climate Impact:** Vulnerability to climate change.
- **Recent Gains:** Benefits from past conservation work and potential for further progress.

All species were then assigned a priority level of 'Urgent,' 'High,' 'Medium,' or 'Low' based on their total score. Species assessed as 'Urgent' or 'High' were designated as priority species or into assemblages:

- **Priority Species:** With individual measures detailed in the LNRS (25 Norfolk-based, 23 Suffolk-based
- **Assemblage Members:** Grouped by primary habitat requirements, forming 15 assemblages. Each assemblage included a flagship species to serve as a public engagement symbol and a success indicator for conservation efforts.

For each of these, appropriate measures and supporting evidence were detailed, including location data and relevant documentation.

The longlist of species was produced for each county using all available online data. Species on this list were expected to benefit from LNRS actions through the creation or enhancement of high-quality habitats in suitable areas. While medium- and low-priority species were not included in the final strategy, those likely to receive significant conservation support via other mechanisms were also highlighted.

These species-based priorities are presented within the Statement of Biodiversity Priorities and linked to the strategic opportunity mapping where appropriate.

Further information on the assessment criteria and scoring system employed is available at **nsnrp.org**.

Disclaimer: Gathering data on Norfolk and Suffolk's rare and threatened species is challenging. The LNRS has been supported by the Norfolk and Suffolk Biodiversity Information Services (NBIS and SBIS) and county recorders. Additional species data may become available and could be incorporated during consultations.

At the time of production of the LNRS, these were expected to be the most suitable actions to support these species based on the information available. However, expected changes to climate patterns may be unpredictable and the actions to support species should be adapted to the latest understanding of how species and habitats are also being affected by the changing climate when information and evidence is available and during LNRS review.

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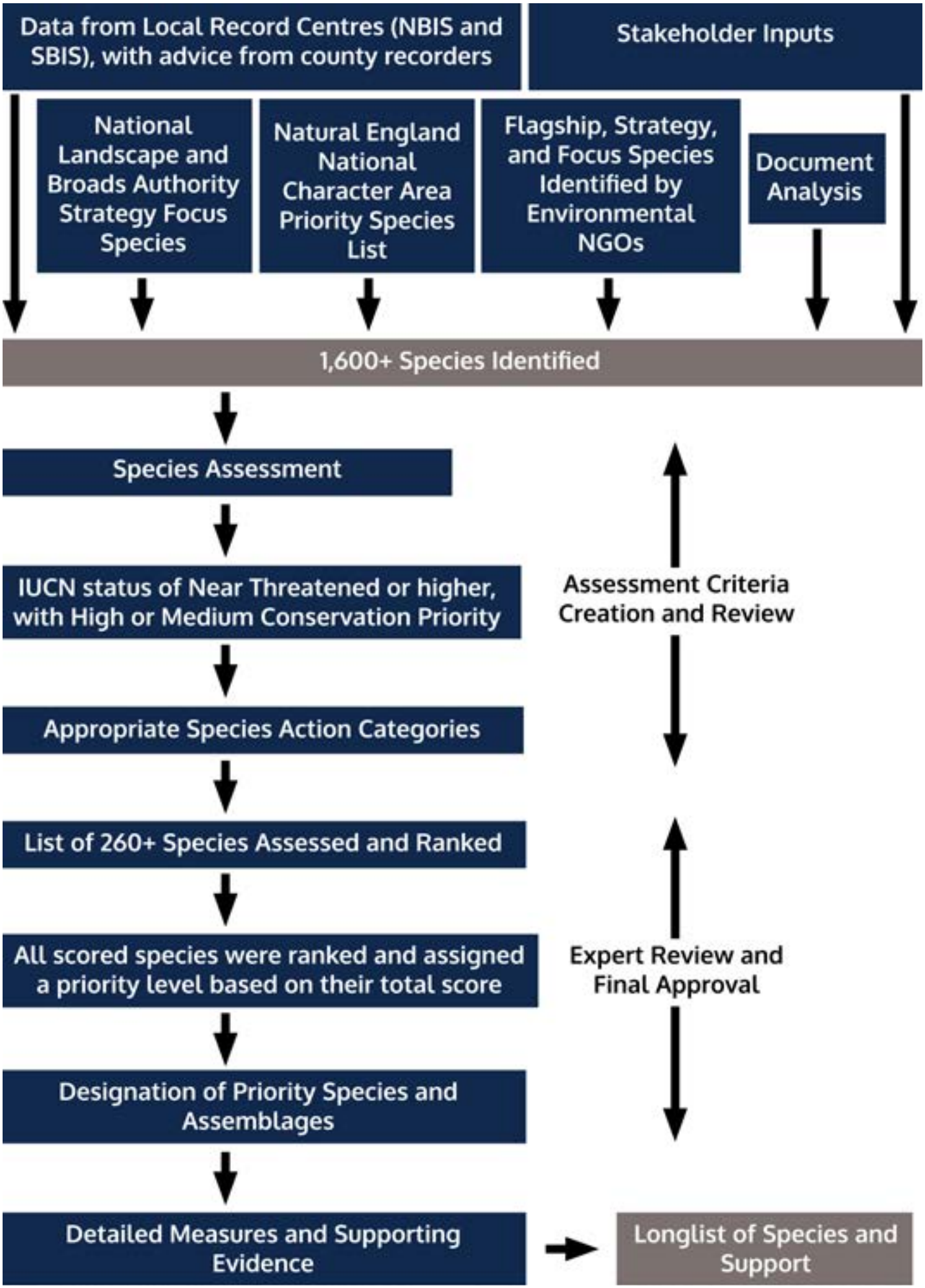
Figure 15. Species longlist and prioritisation process



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Full Norfolk species shortlist

Table 71. Key Species

Common Name(s)	Scientific Name	Taxon Group
Basil-thyme Case-bearer	*Coleophora tricolor*	Invertebrates
Crested buckler fern	*Dryopteris cristata*	Vascular Plants
Crested cowwheat	*Melampyrum cristatum*	Vascular Plants
Dwarf eelgrass	*Zostera noltei*	Vascular Plants
Eurasian Curlew	*Numenius arquata*	Birds
European Eel	*Anguilla anguilla*	Fish
Fen Raft Spider	*Dolomedes plantarius*	Invertebrates
Holly-leaved Naiad	*Najas marina*	Vascular Plants
Intermediate Stonewort	*Chara papillosa*	Non-Vascular Plants
Lapwing	*Vanellus vanellus*	Birds
Lesser Water Measurer	*Hydrometra gracilenta*	Invertebrates
Little Whirlpool Rams-horn Snail	*Anisus (Disculifer) vorticulus*	Invertebrates
Narrow-mouthed Whorl Snail	*Vertigo angustior*	Invertebrates
Natterjack	*Epidalea calamita*	Reptiles and Amphibians
Northern Pool Frog	*Pelophylax lessonae*	Reptiles and Amphibians
One-grooved Diving Beetle	*Bidessus unistriatus*	Invertebrates
Orange-Fruited Elm-lichen	*Caloplaca luteoalba*	Lichen and Fungi
Scarce Vapourer	*Orgyia recens*	Invertebrates
Serotine	*Eptesicus serotinus*	Mammals
Starlet Sea Anemone	*Nematostella vectensis*	Invertebrates
Starry breck lichen	*Buellia asterella*	Lichen and Fungi
Suffolk lungwort	*Pulmonaria obscura*	Vascular Plants
Water Vole	*Arvicola amphibius*	Mammals
White clawed crayfish	*Austropotamobius pallipes*	Invertebrates
Witham Orb Mussel	*Sphaerium solidum*	Invertebrates

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Table 72. Assemblage Species

Common Name(s)	Scientific Name	Taxon Group
A beetle	*Lycoperdina succincta*	Invertebrates
A big headed fly	*Cephalops perspicuus*	Invertebrates
A crawling water beetle	*Haliplus variegatus*	Invertebrates
A dwarf spider	*Baryphyma gowerense*	Invertebrates
A firedot lichen	*Caloplaca virescens*	Lichen and Fungi
A fly	*Erioptera bivittata*	Invertebrates
A jumping spider	*Neon valentulus*	Invertebrates
A leaf beetle	*Galeruca laticollis*	Invertebrates
A lichen	*Wadeana minuta*	Lichen and Fungi
A lichen	*Verrucaria xyloxena*	Lichen and Fungi
A spider	*Rhysodromus fallax*	Invertebrates
A spider	*Baryphyma maritimum*	Invertebrates
A spider	*Clubiona frisia*	Invertebrates
A spider	*Robertus insignis*	Invertebrates
A spittlebug	*Macrosteles oshanini*	Invertebrates
A spittlebug	*Metalimnus formosus*	Invertebrates
A water boatman	*Sigara longipalis*	Invertebrates
Adder	*Vipera berus*	Reptiles and Amphibians
Arctic Tern	*Sterna paradisaea*	Birds
Atlantic salmon	*Salmo salar*	Fish
Barbastelle Bat	*Barbastella barbastellus*	Mammals
Barberry Carpet	*Pareulype berberata*	Invertebrates
Beaver	*Castor fiber*	Mammal
Beech	*Fagus sylvatica*	Vascular Plants
Bell Heather	*Erica cinerea*	Vascular Plants
Bittern	*Botaurus stellaris*	Birds
Black poplar	*Populus nigra subsp. betulifolia*	Vascular Plants
Borrers Saltmarsh-grass	*Puccinellia fasciculata*	Vascular Plants
Broad-fruited Cornsalad	*Valerianella rimosa*	Vascular Plants
Broads Long-legged Fly	*Dolichopus laticola*	Invertebrates
Brook lamprey	*Lampetra planeri*	Fish
Bullfinch	*Pyrrhula pyrrhula*	Birds
Bur Medick	*Medicago polymorpha*	Vascular Plants
Bure Long-legged Fly	*Dolichopus nigripes*	Invertebrates
Chalk Eyebright	*Euphrasia pseudokerneri*	Vascular Plants
Chalk Hill Blue	*Polyommatus coridon*	Invertebrates
Chamomile	*Chamaemelum nobile*	Vascular Plants
Common Cuckoo	*Cuculus canorus*	Birds
Common eelgrass	*Zostera marina*	Vascular Plants
Common Swift	*Apus apus*	Birds
Common Tern	*Sterna hirundo*	Birds
Common toad	*Bufo bufo*	Reptiles and Amphibians
Corn Bunting	*Emberiza calandra*	Birds

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Table 72. Assemblage Species Continued

Common Name(s)	Scientific Name	Taxon Group
Creeping Marshwort	*Apium repens*	Vascular Plants
Cylindrical Whorl Snail	*Truncatellina cylindrica*	Invertebrates
Dark Crimson Underwing	*Catocala sponsa*	Invertebrates
Depressed river mussel	*Pseudanodonta complanata*	Invertebrates
Deptford Pink	*Dianthus armeria*	Vascular Plants
Desmoulin's Whorl Snail	*Vertigo moulinsiana*	Invertebrates
Dingy Skipper	*Erynnis tages*	Invertebrates
Divided Sedge	*Carex divisa*	Vascular Plants
Drab Wood-soldierfly	*Solva marginata*	Invertebrates
Eagle's claws lichen	*Anaptychia ciliaris*	Lichen and Fungi
Early Marsh-orchid (cream-flowered)	*Dactylorhiza incarnata*	Vascular Plants
Fen Mason-wasp	*Odynerus simillimus*	Invertebrates
Fen orchid	*Liparis loeselii*	Vascular Plants
Fen Puffball	*Bovista paludosa*	Lichen and Fungi
Fen Ragwort	*Jacobaea paludosa*	Vascular Plants
Fenn's Wainscot	*Protarchanara brevilinea*	Invertebrates
Field gentian	*Gentianella campestris*	Vascular Plants
Field Maple	*Acer campestre*	Vascular Plants
Field Wormwood/Breckland Mugwort	*Artemisia campestris*	Vascular Plants
Fingered speedwell	*Veronica triphyllos*	Vascular Plants
Fly Orchid	*Ophrys insectifera*	Vascular Plants
Frog Orchid	*Coeloglossum viride*	Vascular Plants
Frogbit	*Hydrocharis morsus-ranae*	Vascular Plants
Geyer's Whorl Snail	*Vertigo geyeri*	Invertebrates
Golden Hoverfly	*Callicera spinolae*	Invertebrates
Golden Lantern-spider	*Agroeca cuprea*	Invertebrates
Grass snake	*Natrix helvetica*	Reptiles and Amphibians
Grass-poly	*Lythrum hyssopifolia*	Vascular Plants
Grayling Butterfly	*Hipparchia semele*	Invertebrates
Great Crested Newt	*Triturus cristatus*	Reptiles and Amphibians
Great sundew	*Drosera anglica*	Vascular Plants
Greater Water Parsnip	*Sium latifolium*	Vascular Plants
Green winged orchid	*Anacamptis morio*	Vascular Plants
Greenfinch	*Chloris chloris*	Birds
Grey Carpet	*Lithostege griseata*	Invertebrates
Grey Hair Grass	*Corynephorus canescens*	Vascular Plants
Grey Partridge	*Perdix perdix*	Birds
Ground-pine	*Ajuga chamaepitys*	Vascular Plants
Hawfinch	*Coccothraustes coccothraustes*	Birds
Hedgehog	*Erinaceus europaeus*	Mammals
Hen Harrier	*Circus cyaneus*	Birds
Hornbeam	*Caprinus betulus*	Vascular Plants
House Martin	*Delichon urbicum*	Birds

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Table 72. Assemblage Species Continued

Common Name(s)	Scientific Name	Taxon Group
House Sparrow	*Passer domesticus*	Birds
Interrupted Brome	*Bromus interruptus*	Vascular Plants
Juniper	*Juniperus communis*	Vascular Plants
Kestrel	*Falco tinnunculus*	Birds
Kingfisher	*Alcedo atthis*	Birds
Large Marsh Grasshopper	*Stethophyma grossum*	Invertebrates
Large-mouthed Valve Snail	*Valvata macrostoma*	Invertebrates
Lesser Spotted Woodpecker	*Dryobates minor comminutus*	Birds
Linnet	*Linaria cannabina*	Birds
Little Tern	*Sternula albifrons*	Birds
Man Orchid	*Orchis anthropophora*	Vascular Plants
Marsh gentian	*Gentiana pneumonanthe*	Vascular Plants
Marsh Tit	*Poecile palustris subsp. palustris/dresseri*	Birds
Milk Parsley	*Thysselinum palustre*	Vascular Plants
Native Elm	*Ulmus serrata*	Vascular Plants
Native oyster	*Ostrea edulis*	Invertebrates
Nightingale	*Luscinia megarhynchos*	Birds
Nightjar	*Caprimulgus europaeus*	Birds
Oak Polypore	*Piptoporus quercinus*	Lichen and Fungi
Opposite-leaved pondweed	*Groenlandia densa*	Vascular Plants
Orange-horned Green Colonel	*Odontomyia angulata*	Invertebrates
Oystercatcher	*Haematopus ostralegus*	Birds
Pasqueflower	*Pulsatilla vulgaris*	Vascular Plants
Pedunculate Oak	*Quercus robur*	Vascular Plants
Pedunculate Sea-purslane	*Atriplex pedunculata*	Vascular Plants
Prickly Saltwort	*Salsola kali subsp. kali*	Vascular Plants
Proliferous Pink	*Petrorhagia prolifera*	Vascular Plants
Purple Emperor	*Apatura iris*	Invertebrates
Red-backed Shrike	*Lanius collurio*	Birds
Redpoll	*Acanthis cabaret*	Birds
Redshank	*Tringa totanus*	Birds
Red Tipped Cudweed	*Filago lutescens*	Vascular Plants
Ribbon-leaved Water-plantain	*Alisma gramineum*	Vascular Plants
Ringed Plover	*Charadrius hiaticula*	Birds
Round leaved sundew	*Drosera rotundifolia*	Vascular Plants
Rowan	*Sorbus aucuparia*	Vascular Plants
Sand catchfly	*Silene conica*	Vascular Plants
Sandwich Click Beetle	*Melanotus punctolineatus*	Invertebrates
Scarce emerald damselfly	*Lestes dryas*	Invertebrates
Scarce Pug	*Eupithecia extensaria subsp. oc-cidua*	Invertebrates
Sea Barley	*Hordeum marinum*	Vascular Plants

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Table 72. Assemblage Species Continued

Common Name(s)	Scientific Name	Taxon Group
Seaside Pansy	*Viola tricolor subsp. curtisii*	Vascular Plants
Silver Studded Blue	*Plebejus argus*	Invertebrates
Skylark	*Alauda arvensis*	Birds
Slender Hare's-ear	*Bupleurum tenuissimum*	Vascular Plants
Small Cord-grass	*Spartina maritima*	Vascular Plants
Small Leaved LIme	*Tilia cordata*	Vascular Plants
Small-flowered Catchfly	*Silene gallica*	Vascular Plants
Spider	*Karita paludosa*	Invertebrates
Spider	*Centromerus semiater*	Invertebrates
Spider	*Gongylidiellum murcidum*	Invertebrates
Spined Loach	*Cobitis taenia*	Fish
Spiny Restharrow	*Ononis spinosa*	Vascular Plants
Spotted Flycatcher	*Muscicapa striata*	Birds
Spring Speedwell	*Veronica verna*	Vascular Plants
Starfruit	*Damasonium alisma*	Vascular Plants
Starling	*Sturnus vulgaris*	Birds
Stone curlew	*Burhinus oedicnemus*	Birds
Stoneworts	*Chara species*	Non-Vascular Plants
String of Sausages Lichen	*Usnea articulata*	Lichen and Fungi
Sulphur Clover	*Trifolium ochroleucon*	Vascular Plants
Swallow	*Hirundo rustica*	Birds
Swallowtail	*Papilio machaon*	Invertebrates
Sweet Chestnut	*Castanea sativa*	Vascular Plants
Swollen Spire Snail	*Mercuria tachoensis*	Invertebrates
Tansy Beetle	*Chrysolina graminis*	Invertebrates
Tree Sparrow	*Passer montanus*	Birds
Turtle Dove	*Streptopelia turtur*	Birds
Twayblade	*Neottia ovata*	Vascular Plants
Water Dock Case Bearer	*Coleophora hydrolapathella*	Invertebrates
Water violet	*Hottonia palustris*	Vascular Plants
White Letter Hairstreak	*Satyrium w-album*	Invertebrates
Whooper swan	*Cygnus cygnus*	Birds
Wild Service Tree	*Sorbus torminalis*	Vascular Plants
Willow Tit	*Poecile montanus*	Birds
Wilson’s Pottia	Tortula wilsonii	Non-Vascular Plants
Wolf Spider	*Hygrolycosa rubrofasciata*	Invertebrates
Woodlark	*Lullula arborea*	Birds
Wormwood moonshiner	*Amara fusca*	Invertebrates
Yarrow broomrape	*Orobanche purpurea*	Vascular Plants
Yellow Wagtail	*Motacilla flava*	Birds
Yellowhammer	*Emberiza citrinella*	Birds
Yellow-vetch	*Vicia lutea*	Vascular Plants

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Table 72. Assemblage Species Continued

Common Name(s)	Scientific Name	Taxon Group
Yew	*Taxus baccata*	Vascular Plants
Zircon Reed Beetle	*Donacia aquatica*	Invertebrates

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Table 73. Scored Species Expected to Benefit from proposed LNRS Measures

Common Name(s)	Scientific Name	Taxon Group
A lichen	*Lecania coerulescens*	Lichen and Fungi
A lichen	*Psora decipiens*	Lichen and Fungi
A lichen	*Roccella phycopsis*	Lichen and Fungi
A long toed water beetle	*Dryops anglicanus*	Invertebrates
A water beetle	*Graphoderus bilineatus*	Invertebrates
Baltic stonewort	*Chara baltica*	Vascular Plants
Bewick's Swan (Tundra Swan)	*Cygnus columbianus bewickii*	Birds
Broad-leaved Cudweed	*Filago pyramidata*	Vascular Plants
Burbot	*Lota lota*	Fish
Coot	*Fulica atra*	Birds
Copse-bindweed	*Fallopia dumetorum*	Vascular Plants
Dwarf Stonewort	*Nitella tenuissima*	Non-Vascular Plants
Eurasian Red Squirrel	*Sciurus vulgaris*	Mammal
Fine-leaved Sandwort	*Minuartia hybrida*	Vascular Plants
Flat-sedge	*Blysmus compressus*	Vascular Plants
Frogbit Smut	*Tracya hydrocharidis*	Lichen and Fungi
Goldeneye	*Bucephala clangula*	Birds
Grape-hyacinth	*Muscari neglectum*	Vascular Plants
Jumping spider	*Marpissa radiata*	Invertebrates
Large Copper	*Lycaena dispar*	Invertebrates
Least Lettuce	*Lactuca saligna*	Vascular Plants
Lesser Butterfly Orchid	*Platanthera bifolia*	Vascular Plants
Moorhen	*Gallinula chloropus*	Birds
Mousetail	*Myosurus minimus*	Vascular Plants
Mussel	*Mytilus edulis*	Invertebrates
Northern wheatear	*Oenanthe oenanthe*	Birds
Osprey	*Pandion haliaetus*	Birds
Oxlip	*Primula elatior*	Vascular Plants
Pillwort	*Pilularia globulifera*	Non-Vascular Plants
Rare Spring-sedge	*Carex ericetorum*	Vascular Plants
Red-breasted Merganser	*Mergus serrator*	Birds
Scaly Breck-Lichen	*Squamarina lentigera*	Lichen and Fungi
Scarlet Malachite Beetle	*Malachius aeneus*	Invertebrates
Scrambled egg lichen	*Fulgensia fulgens*	Lichen and Fungi
Set-aside Downy-back	*Ophonus laticollis*	Invertebrates
Tiny Earthstar	*Geastrum minimum*	Lichen and Fungi
Whinchat	*Saxicola rubetra*	Birds
Wild Candytuft	*Iberis amara*	Vascular Plants
Wolf Spider	*Arctosa fulvolineata*	Invertebrates
Wryneck	*Jynx torquilla*	Birds

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Appendix 3: Priorities associated to environmental objectives

To demonstrate how the priorities identified within this strategy deliver against the appropriate ambitions and environmental objectives, the following tables (**Tables 74 - 93**) list the considered alignment between measures, benefits and targets. Each benefit or target is assigned a code eg WEB1 within the tables below, and were ranked in terms of their considered relevance.

For each habitat area, the priorities were assessed against:

- Wider Environmental Benefits (as discussed in **Part B**)
    - Climate change mitigation (WEB1)
    - Improvement in water quality (WEB2)
    - Increasing water quantity (WEB3)
    - Improving air quality (WEB4)
    - Improving soil quality and health (WEB5)
    - Reduction in flood risk (WEB6)
- Environment Act (2021) targets:
    - restore or create in excess of 500,000 hectares of wildlife-rich habitat outside of protected sites (EA1)
    - halt the decline of species abundance (EA2)
    - reduce the risk of species' extinction (EA3)
    - increase total tree and woodland cover (EA4)
    - improve water quality and availability (EA5).
- National Environmental Objectives (NEOs):
    - work to ensure that everyone in England lives within 15 minutes' walk of a green or blue space (NEO1)
    - restore approximately 280,000 hectares of peatland (NEO2)
    - restore 75% of our water bodies to good ecological status (NEO3)
    - protect 30% of land and sea for nature's recovery (NEO4)
    - support farmers to create or restore 30,000 miles of hedgerows (NEO5)
    - manage our woodlands for biodiversity, climate and sustainable forestry (NEO6)
    - restore 75% of Sites of Special Scientific Interest to favourable condition by 2042 (NEO7)
    - ensure delivery and management of actions and policies that contribute towards our goals are suitable and adaptive to a changing climate (NEO8)
    - make sure LNRSs include proposals for nature-based solutions which improve flood risk management where appropriate (NEO9)
    - achieve Good Environmental Status for our seas (NEO10)

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- reduce emissions of nitrogen oxides by 73% and ammonia by 16% (NEO11)
- reducing the rates of introduction and establishment of invasive non-native species by at least 50%, (NEO12).

- Protected Landscapes non-statutory targets:

  - restore or create more than 250,000 hectares of a range of wildlife-rich habitats (PL1)
  - bring 80% of SSSIs into favourable condition (PL2)
  - for 60% of SSSIs assessed as having 'actions on track' to achieve favourable condition (PL3)
  - continuing favourable management of all existing priority habitat already in favourable condition and increasing to include all newly restored or created habitat through agri-environment schemes (PL4)
  - ensuring at least 65% to 80% of land managers adopt nature friendly farming on at least 10% to 15% of their land (PL5)
  - reduce net greenhouse gas emissions to net zero (PL6)
  - restore approximately 130,000 hectares of peat (PL7)
  - increase tree canopy and woodland cover (combined) by 3% of total land area (PL8)

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Table 74. Mixed Deciduous Woodland delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new deciduous woodland	M	M	N	M	Y	M	EA4 EA1	NEO6 NEO9 NEO8	PL8
Enlarge and expand existing deciduous woodland	Y	M	N	M	Y	M	EA4 EA1	NEO6 NEO9 NEO8 NEO4	PL8
Connect deciduous woodland areas	Y	M	N	M	Y	M	EA4 EA1	NEO6 NEO4 NEO8	PL8
Restore and enhance existing deciduous woodland	Y	M	N	M	Y	M	EA4 EA1	NEO6 NEO4 NEO9 NEO12 NEO7	PL8

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 75. Wet Woodland delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new wet woodland where feasible	M	M	M	M	Y	M	EA4 EA1	NEO6 NEO9 NEO8	PL8
Enlarge and expand existing wet woodland	Y	M	M	M	Y	M	EA4 EA1	NEO6 NEO9 NEO8 NEO4	PL8
Connect wet woodland areas	Y	M	M	M	Y	M	EA4 EA1	NEO6 NEO9 NEO8 NEO4	PL8
Restore and enhance existing wet woodland	Y	M	M	M	Y	M	EA4 EA1	NEO6 NEO4 NEO9 NEO12 NEO8	PL8

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 76. Scrub delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new scrub where feasible and desirable	Y	N	M	M	Y	M	EA1 EA3	NEO4 NEO8	NA
Enlarge and expand existing scrub	Y	N	M	M	Y	M	EA1 EA3	NEO4 NEO8	NA
Connect scrub areas	Y	N	M	M	Y	M	EA1 EA3	NEO4 NEO8	NA
Restore and enhance existing scrub	Y	N	M	M	Y	M	EA1 EA3	NEO4 NEO12 NEO8 NEO7	NA

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 77. Habitats in Farmed Landscapes delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Enlarge and expand existing arable field margins	M	M	N	M	Y	M	EA1 EA3	NEO4 NEO8	PL5
Connect arable field margins	Y	M	N	M	Y	M	EA1 EA3	NEO4 NEO8	PL5
Restore and enhance existing arable field margins	Y	M	N	M	Y	M	EA1 EA3	NEO4 NEO12 NEO8 NEO7	PL5
Create new hedgerows using appropriate native species	M	M	N	M	Y	M	EA1 EA3	NEO5 NEO8	PL5
Restore and enhance existing hedgerows	M	M	N	M	Y	M	EA1 EA3	NEO5 NEO12 NEO8 NEO7	PL5
Establish more hedgerow tress	Y	M	N	M	Y	M	EA1 EA3	NEO5 NEO8	PL5

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 78. Wood Pasture and Parkland delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new wood pasture where feasible	M	M	N	M	Y	M	EA4 EA1	NEO6 NEO8	PL8
Enlarge and expand existing wood pasture	Y	M	N	M	Y	M	EA4 EA1	NEO6 NEO8 NEO4	PL8
Connect wood pasture areas	Y	M	N	M	Y	M	EA4 EA1	NEO6 NEO8 NEO4	PL8
Restore and enhance existing wood pasture	Y	M	N	M	Y	M	EA4 EA1	NEO6 NEO8 NEO4	PL8
Restore, enhance and re-create existing and former parkland	Y	M	N	M	Y	M	EA4 EA1	NEO6 NEO4 NEO12 NEO8 NEO7	PL8

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 79. Traditional Orchards delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new traditional orchards where feasible	M	M	N	M	Y	M	EA4 EA1	NEO6 NEO8	PL8
Enlarge and expand existing traditional orchards	Y	M	N	M	Y	M	EA4 EA1	NEO6 NEO8 NEO4	PL8
Restore and enhance existing traditional orchards	Y	M	N	M	Y	M	EA4 EA1	NEO6 NEO12 NEO8 NEO7	PL8

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 80. Habitats in Urban, Built and Garden Environments delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Improve the condition of the existing urban tree estate	Y	M	N	Y	M	M	EA4 EA1	NEO6 NEO8 NEO4	PL8
Increase urban tree cover	Y	M	N	Y	M	M	EA4 EA1	NEO6 NEO8 NEO4	PL8
Identify focus areas for improved garden connectivity and wildlife friendly management practices	M	M	M	Y	Y	M	EA1 EA2	NEO6 NEO1 NEO12 NEO8	PL8
Identify areas suitable for creation of community gardens	M	M	N	Y	Y	M	EA1 EA2	NEO1 NEO8 NEO4	NA
Create green crossings over roads or railway lines that fragment blocks of habitat	M	M	N	M	Y	M	EA1 EA2	NEO8 NEO4 NEO6	NA
Create or enhance areas of appropriate habitat alongside existing railway network or new infrastructure	M	M	N	M	Y	M	EA1 EA2	NEO8 NEO4 NEO6	NA
Create new habitats through drainage features on development sites	Y	Y	M	M	Y	M	EA1 EA5	NEO9 NEO8 NEO4	NA

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 81. Heathland and Acid Grassland delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new heathland areas where feasible and desirable	M	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Enlarge and expand existing heathland	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Restore and enhance existing heathland	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO12 NEO8	PL4
Create new acid grassland where feasible and desirable	M	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Enlarge and expand existing acid grassland	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Restore and enhance existing acid grassland	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 82. Grassland Habitat delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new grassland areas where feasible and desirable	M	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Enlarge and expand existing grassland	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Connect grassland areas	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Restore and enhance existing grassland	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO12 NEO8	PL4
Create new calcareous grassland areas where feasible and desirable	M	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Enlarge and expand existing calcareous grassland	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Connect calcareous grassland areas	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Restore and enhance existing calcareous grassland	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO12 NEO8	PL4
Create new lowland meadows and pastures where feasible and desirable	M	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Enlarge and expand existing lowland meadows and pastures	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 82. Grassland Habitat delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes continued.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Connect lowland meadow and pasture areas	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO8	PL4
Restore and enhance existing lowland meadows and pastures	Y	M	N	M	Y	M	EA1 EA2	NEO7 NEO4 NEO12 NEO8	PL4

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 83. Wet Grassland delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new wet grassland and grazing marshes where feasible and desirable	M	M	M	M	Y	M	EA1 EA2	NEO4 NEO8	PL4
Enlarge and expand existing wet grassland and grazing marshes where feasible and desirable	Y	M	M	M	Y	M	EA1 EA2	NEO4 NEO8	PL4
Connect wet grassland and grazing marshes areas where feasible	Y	M	M	M	Y	M	EA1 EA2	NEO4 NEO8	PL4
Restore and enhance existing wet grassland and grazing marshes	Y	M	M	M	Y	M	EA1 EA2	NEO4 NEO12 NEO8 NEO7	PL4

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 84. Open Mosaic Habitat delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new open mosaic habitat where feasible and desirable	M	M	M	M	Y	M	EA1 EA2	NEO8	PL4
Enlarge and expand existing open mosaic habitat where feasible	Y	M	M	M	Y	M	EA1 EA2	NEO8	PL4
Improve and enhance existing open mosaic habitat	Y	M	M	M	Y	M	EA1 EA2	NEO12 NEO8 NEO7	PL4

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 85. Rivers and Streams delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Restore and enhance existing rivers, streams and ditches	Y	Y	Y	M	M	M	EA5	NEO3 NEO12 NEO8 NEO7	PL3
Improve management of water resources through nature-based solutions	Y	Y	Y	M	M	M	EA5	NEO9 NEO8	PL3
Strengthen mosaic of wetland habitats along river channels	Y	Y	Y	M	M	M	EA1 EA5	NEO3 NEO12 NEO8	PL3
Improve river, riparian and floodplain habitat	Y	Y	Y	M	M	M	EA5	NEO3 NEO12 NEO8	PL3
Restore and enhance chalk stream habitats	M	Y	Y	M	M	M	EA5	NEO3 NEO12 NEO8 NEO7	PL3

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 86. Still Water Habitats delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new still water habitats where feasible and desirable	M	Y	Y	M	M	M	EA5	NEO3 NEO8	PL3
Restore appropriate pond habitats	Y	Y	Y	M	M	M	EA5	NEO3 NEO12 NEO8 NEO7	PL3
Enhance existing pond habitats	Y	Y	Y	M	M	M	EA5	NEO3 NEO12 NEO8 NEO7	PL3
Restore, maintain and enhance lake and broad habitats	Y	Y	Y	M	M	M	EA5	NEO3 NEO12 NEO8	PL3

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 87. Fen Habitats delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new fen habitats and multi use wetlands	Y	Y	M	M	Y	M	EA1 EA5	NEO8	PL3
Enlarge, expand and connect existing fen habitats	Y	Y	M	M	Y	M	EA1 EA5	NEO8	PL3
Retore and enhance existing fen habitats	Y	Y	M	M	Y	M	EA1 EA5	NEO4 NEO2 NEO12 NEO8 NEO7	PL7

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 88. Reedbeds delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new reedbed habitat	M	Y	M	M	Y	M	EA1 EA5	NEO8	PL3
Enlarge, expand and connect existing reedbed habitat	Y	Y	M	M	Y	M	EA1 EA5	NEO8	PL3
Retore and enhance existing reedbed	Y	Y	M	M	Y	M	EA1 EA5	NEO4 NEO2 NEO12 NEO8 NE7	PL7

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 89. Coastal Saltmarsh and Intertidal Mudflats delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Create new saltmarsh where feasible and desirable	M	Y	M	M	Y	M	EA1 EA2	NEO8 NEO10	PL1
Enlarge and expand existing saltmarsh	Y	Y	M	M	Y	M	EA1 EA2	NEO8 NEO10	PL1
Restore and enhance existing saltmarsh	Y	Y	M	M	Y	M	EA1 EA2	NEO4 NEO12 NEO8 NEO12 NEO7	PL1
Create new intertidal mudflats where feasible and desirable	Y	Y	M	M	Y	M	EA1 EA2	NEO8 NEO10	PL1
Enlarge and expand existing intertidal mudflats	Y	Y	M	M	Y	M	EA1 EA2	NEO8 NEO10	PL1
Retore and enhance existing intertidal mudflats	Y	Y	M	M	Y	M	EA1 EA2	NEO4 NEO12 NEO8 NEO10 NEO7	PL1

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 90. Coastal Sand Dunes delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Facilitate the formation of new coastal sand dunes	M	M	N	M	M	M	EA1 EA2	NEO8	PL1
Enlarge and expand existing coastal sand dunes	Y	M	N	M	M	M	EA1 EA2	NEO8	PL1
Retore and enhance existing coastal sand dunes	Y	M	N	M	M	M	EA1 EA2	NEO4 NEO12 NEO8 NEO7	PL1

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 91. Coastal Vegetated Shingle delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Facilitate the formation of new coastal vegetated shingle	Y	M	N	M	M	M	EA1 EA2	NEO8	PL1
Enlarge and expand existing coastal vegetated shingle	Y	M	N	M	M	M	EA1 EA2	NEO8	PL1
Retore and enhance existing coastal vegetated shingle	Y	M	N	M	M	M	EA1 EA2	NEO4 NEO12 NEO8 NEO7	PL1

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 92. Maritime Cliffs and Slopes delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Facilitate the formation of new maritime cliffs and slopes	M	M	N	M	M	M	EA1 EA2	NEO8	PL1
Enlarge and expand existing maritime cliffs and slopes	Y	M	N	M	M	M	EA1 EA2	NEO8	PL1
Retore and enhance existing maritime cliffs and slopes	Y	M	N	M	M	M	EA1 EA2	NEO8	PL1

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Table 93. Saline Lagoons delivery against objectives for Wider Environmental Benefits (WEB), Environment Act targets (EA), National Environmental Objectives (NEO), and non-statutory targets for Protected Landscapes.

Potential Measure	WEB 1	WEB 2	WEB 3	WEB 4	WEB 5	WEB 6	EA	NEO	PL
Facilitate the formation of new saline lagoons	M	M	N	M	N	M	EA1	NEO3 NEO8 NEO10	PL1
Enlarge and expand existing saline lagoons	Y	M	N	M	N	M	EA1	NEO3 NEO8 NEO10	PL1
Retore and enhance existing saline lagoons	Y	M	N	M	N	M	EA1	NEO4 NEO12 NEO8 NEO10 NEO7	PL1

Green (Y) shows a positive link, orange (M) shows a potential link, and grey (N) means no link and NA means none applicable to the targets.

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Appendix 4: Methodology - Mapping

Overview

The mapped aspect of the LNRS is described in the statutory guidance as the 'Local Habitat Map'. This habitat map must consist of three main components:

- a map of areas of particular importance to biodiversity
- a map of areas that could become of particular importance for biodiversity
- a map of potential nature recovery measures that could be taken.

The methods to create these three mapped components are detailed below, and consisted of a combination of stakeholder input and geospatial analysis, or 'rules-based mapping'.

Whilst every effort has been made to ensure the accuracy of the mapping, the analysis undertaken has not been subject to ground-truthing, and relies on a range of input datasets which may result in errors in classification for some parcels of land.

Part 1. Identify areas of particular importance for biodiversity (APIB)

The APIB map indicates areas that are currently recognised as important for biodiversity through various local, national and international designations.

The suitability of any site for proposed measures would require assessment as detailed in **Part C**, which would include identification of any recent land use changes to ensure the most up to date information is included.

The primary purpose of mapping potential measures is to identify areas that could become of particular importance for biodiversity (ACBs) and therefore the majority of measures will not be mapped to APIBs.

The types of sites that can be included in the APIB map are clearly defined in the LNRS Statutory Guidance. The purpose of these guidelines is to ensure that the APIB mapping is consistent across all LNRS areas, and so additional sites and other priority habitat areas could not be included at this stage. The types of sites and designations within the APIB map are described in **Table 94**.

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Table 94. APIB components by designation type.

Irreplaceable habitat	Local Designations	National Designations	International Designations
Ancient woodland	County Wildlife Sites	National Nature Reserves	Special Protection Areas
Veteran trees	Local nature reserves	Sites of special scientific interest	Special Areas of Conservation
Coastal sand dunes		Marine Conservation Zones[1]	Ramsar Sites
Lowland Fen			
Spartina saltmarsh swards and Mediterranean saltmarsh scrub			

1 Marine Conservation Zones fall outside of the LNRS strategy boundary but are still included.

Part 2. Identify areas and land parcels that could become of particular importance for biodiversity (ACBs)

To help identify ACBs, a number of separate components were combined. Multiple different datasets were considered and assessed with expert stakeholder input, to determine which best represent areas of strategic significance for nature recovery. The components were then merged, and suitable land parcels within them were extracted, representing the total extent of ACBs. Each component representing an area of strategic significance is detailed below:

- **Lawton Zones:** A 250 m buffer around existing APIB (with addition of Roadside Nature Reserves) representing the Lawton principles of bigger (where habitats could be expanded) and more joined (where new linkages between APIB could be created). The buffer was extended to 500 m where this allowed two buffers to join up.
- **Churchyards:** A 250 m buffer around churchyards, which can provide small stepping-stones of semi natural or natural habitat across the strategy areas.
- **Roadside Nature Reserves:** A 250 m buffer around these sites which provide important wildlife corridors.
- **Veteran Trees:** A 30 m buffer around tree point locations.
- **Deep peaty soils:** The extent of deep peat represents important fenland areas in Norfolk and Suffolk, as well as areas with the potential for associated carbon storage.
- **Natural England Habitat Networks:** The NE habitat networks show where existing priority habitats could be made better, bigger and more joined. Use of the habitat networks means priority habitats outside of APIB designations can be captured within the ACB.

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- **Rivers:** A 50 m buffer around major rivers, which offer vital habitat and connectivity through the landscape
- **Other areas that support key species, and sites suggested by stakeholders:** These include areas that support known populations of key species identified in the LNRS, and buffers around sites where nature recovery is already taking place.

Land parcels at least 33% within these areas were then extracted from a habitat basemap to form the final ACB map. These also formed the baseline of candidate sites to which potential measures could be assigned. Within this ACB layer, areas were also highlighted where potential measures would offer wider environmental benefits, particularly related to water quality and flood mitigation. This was done by identifying 'surface runoff pathways' (the locations where water is known to move across the ground's surface before entering nearby watercourses). Actions here could offer benefits such as a reduction in the flow of water and rate of agrochemicals entering rivers and streams.

As with all parcels shown as ACB, the suitability of any site for proposed measures would require assessment to confirm the specific biodiversity opportunities for these areas.

Part 3. Mapping Potential Measures (PMs)

A dual approach of stakeholder input and geospatial analysis was taken to assign suitable measures to land parcels across the wide range of habitats identified in the Statement of Biodiversity Priorities.

The process (illustrated in **Figure 16**) began by identifying areas of strategic importance for biodiversity. Using the Habitat Basemap and existing land parcel data, candidate land parcels were extracted from within these strategically important areas. From this, areas that could have become of particular importance to biodiversity (ACBs) were identified for further analysis.

Once these candidate areas were established, habitat measures were assigned based on both rules-based suitability and stakeholder input. The results were then refined by applying constraints to remove any areas deemed unsuitable. Following this, habitat mosaic measures were identified to support a more ecologically coherent approach. The final output was a mapped set of potential measures, covering both individual habitats and broader habitat mosaics, to inform future conservation and land management decisions.

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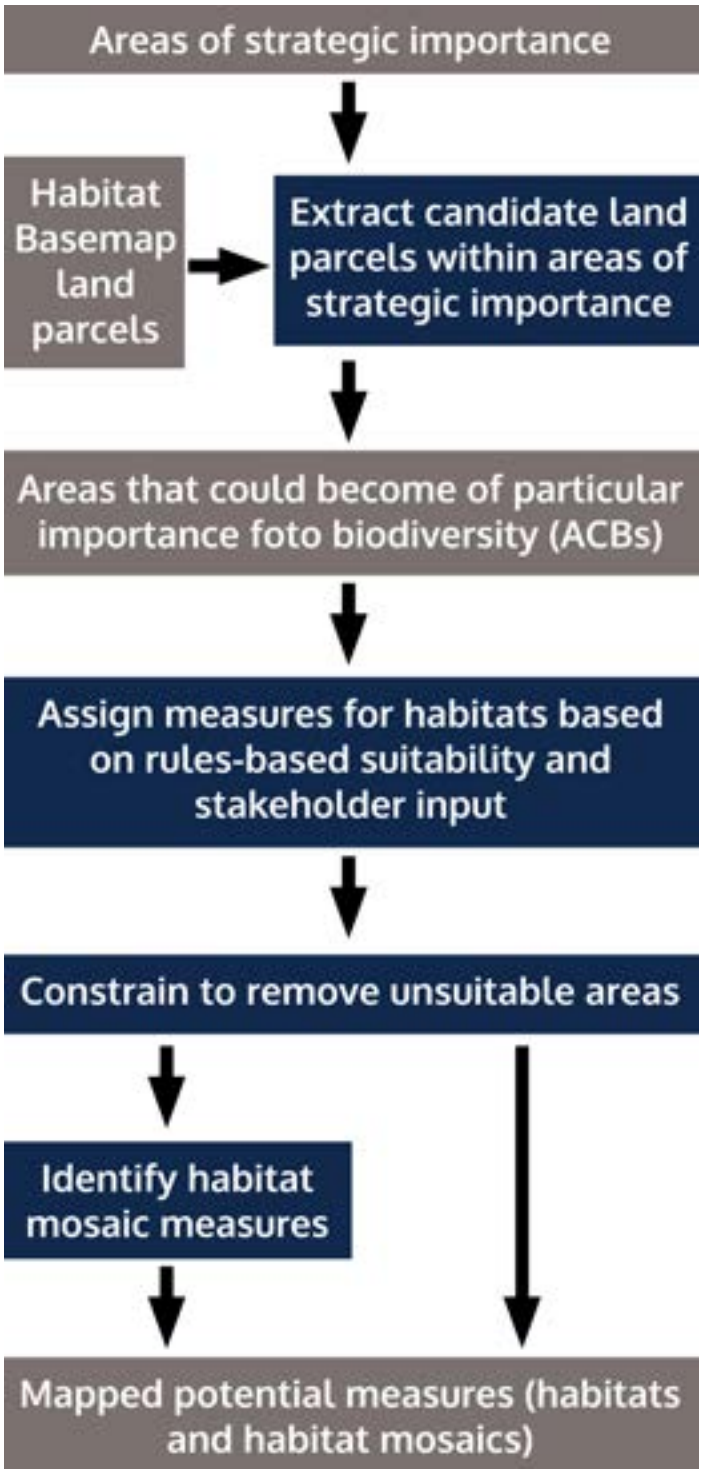
Figure 16. Overview of process for mapping potential measures within ACBs.



Geospatial Rules-based Mapping of Measures

An analytical approach to mapping allowed specific measures for the creation and enhancement of each habitat type to be assigned consistently within any suitable areas across the strategy area. Suitability criteria specific to each habitat type were used to assign potential measures to each candidate land parcel within the ACBs. Suitability was assessed on factors such as:

- **Soil type:** Some habitats such as grassland, wetlands and heathlands require specific soil conditions which would limit habitat creation opportunities.
- **Existing Land Use:** Candidate land parcels were filtered based on the suitability of the existing land use/ habitat type (e.g. excluding urban infrastructure).
- **Proximity to Natural England Habitat Networks:** These are buffers around existing habitats and can help prioritise parcels that are closer to existing priority habitat, making them 'bigger' and 'more joined up'.
- **Landscape Character Type:** Using landscape character areas to prioritise habitat creation ensures that efforts align with the unique ecological, cultural, and physical characteristics of each area.
- **Suitability for delivering environmental benefits:** some habitat creation opportunities were assigned where they intersect with watercourses or overland flow pathways, in order to show where measures may deliver wider environmental benefits.

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- **Suitability identified by external models and datasets:** Certain habitats have detailed suitability models already available, and so these datasets were incorporated where possible.

Additional information was then added to highlight a need for further consideration where potential measures intersected site allocations and airfield safeguarding zones. Where necessary constraints were also used to entirely exclude unsuitable areas (for instance in the case of scheduled monuments). Measures were not mapped within existing APIB as these areas have specific management plans already in place.

Habitat Mosaics

In many areas of the local habitat map, multiple potential measures overlap within the same land parcels. Some of these overlaps provide an opportunity to create diverse, transitional landscapes through the development of habitat mosaics.

To support this, habitat mosaic measures have been applied to parcels identified as suitable for establishing two or more habitats that follow natural succession patterns (eg Grassland–Scrub–Mixed Deciduous Woodland).

To determine the percentage contribution of each habitat within a mosaic, a weighting score is assigned based on its Biodiversity Net Gain distinctiveness category.

The scores are equally distributed across categories and allocated as follows: Very High = 1, High = 0.75, Medium = 0.5, and Low = 0.25.

The percentage contribution of each habitat within the mosaic was then calculated by dividing the score of the individual habitat by the total score for the entire mosaic combination, and multiplying the result by 100.

Stakeholder Mapping of Measures

Stakeholders provided additional mapped measures through input into an online mapping tool. These submitted locations were compared against the existing APIB and rules-based measure layers, revealing that 84% of the submitted stakeholder measures were at least partially captured by existing APIB and ACB. Each stakeholder measure was then evaluated manually based on the suitability of the location and measure being proposed, and the extent to which similar rules-based measures had already been mapped. Any suitable measures outside of the existing mapping were then combined with the rules-based measures described above.

Unmapped Measures

It is not possible to map all of the measures detailed within the strategy, as some can be applied widely across many different areas, or would require more detailed surveying to select suitable sites. A large amount of unmapped measures occur within urban loca-tions, where the available data is less able to define suitable locations due to the com-plexity of the urban environment. It is recommended that the full range of unmapped measures are considered alongside those represented on the local habitat map.

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Part 4: Species Mapping and Prioritisation

The key species identified within the Statement of Biodiversity Priorities were mapped using records from the Norfolk Biodiversity Information Service (NBIS). Overlaying species occurrences onto the ACBs helped to validate the map, by establishing to what extent species are supported by these areas.

For each key species, the number and proportion of occurrences that that were inside of or were within 50m of ACBs and APIB was calculated, with the buffer being used to account for uncertainty in record locations and natural species movement. A summary table was then produced to indicate what percentage of each species could be found within ACB/ APIB.

Two heat maps were then produced to compare the distribution of species across the strategy area. The first summarised the total count of occurrences for all species, aggregating the point data to show where most records are concentrated. The second heat map used a count of unique key species, to draw attention to areas with a high diversity of species.

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Appendix 5: Partnership overview

The Norfolk and Suffolk Nature Recovery Partnership (NSNRSP) brings together approximately 80 local organisations with a shared vision for protecting and restoring nature in East Anglia. It is convened by Norfolk and Suffolk County Councils.

The Partnership was created to develop the Norfolk and Suffolk 25 Year Environment Plan and has worked with the University of East Anglia to create a comprehensive inventory of natural capital in both counties, The Natural Capital Evidence Compendium.

Now, because of the significant advantages of working closely with neighbouring counties in the development of Local Nature Recovery Strategies, the Partnership's main focus throughout 2025 is the development of a strategy for each county.

Norfolk Planning Themed Working Group meeting in May 2024.

Oversight

Supporting Authorities provide oversight for each strategy. These include 12 district and borough councils, the Broads Authority and Natural England.

The Partnership LNRS Steering Group represents a broad membership of key stakeholder organisations and provides guidance and advice on strategy development.

Evidence and Expertise

The Steering Group operates in conjunction with six specialist Themed Working Groups and wider sectors of society to provide a wide range of experience and representation.

Delivery

The Nature Recovery Partnership Manager co-ordinates LNRS delivery teams from each County Council who are responsible for delivering a wide-ranging programme of face-to-face and online engagement, analysing data to inform the strategy and drafting the strategy document.

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Glossary

ACB: Areas that could become of particular importance for biodiversity – those areas identified to be of strategic significance and present opportunities for nature recovery.

APIB: Areas of particular importance for biodiversity - the locations of the important and diverse habitats that make up the ecological network across the county.

Abstraction (in context of water resources): The removal of water from natural sources like rivers or groundwater for human use.

Ancient woodland: Woodland that has existed continuously since 1600 or before in England and Wales.

Aquifers: Underground layers of water-bearing permeable rock, rock fractures or unconsolidated materials.

Arable: Any land capable of being ploughed and used to grow crops

Assemblage: Within this LNRS, this refers to a group of species that co-exist within a specific habitat type, such as grassland, woodland or urban environment. A flagship species has been selected for each assemblage to symbolise conservation efforts and engage the public.

Biodiversity: The variety of plant and animal life in a particular habitat or on Earth generally.

Biodiversity Net Gain (BNG): An approach to development that leaves biodiversity in a better state than before. Developers and Local Planning Authorities must deliver a BNG of 10%. The LNRS plays a role in BNG by determining the 'strategic significance' multiplier within the biodiversity metric. This mechanism means that there is an incentive for developers to align with the LNRS in their area when choosing the location of off-site BNG units.

Carbon capture: The process of collecting or trapping carbon dioxide (CO_2) from large sources, such as power plants or industrial facilities, or directly from the atmosphere. This is typically the first step in managing CO_2 emissions.

Carbon sequestration: The long-term storage of captured carbon dioxide, either naturally through processes like photosynthesis in plants and absorption by oceans, or artificially through various technological methods. This is the end goal of removing CO_2 from the atmosphere to mitigate climate change.

Climate resilience: The ability of a system, community, or ecosystem to anticipate, prepare for, respond to and recover from the impacts of climate change, including extreme weather events and long-term environmental changes.

Coastal squeeze: The loss of natural coastal habitats due to rising sea levels and coastal defences.

Connectivity: The degree to which landscapes allow species to move freely and ecological processes to function.

Corridors: Wildlife corridors are linear features in the landscape that can be used for movement of wildlife. They offer the possibility of linking habitats and reducing the isolation of populations.

Coppicing: A traditional method of woodland management where trees are cut down to ground level, promoting new growth from the stumps.

Countryside Stewardship: A scheme that provides financial incentives for farmers and land managers to look after the environment.

Critically endangered: A species facing an extremely high risk of extinction in the wild.

Disturbance susceptibility: How effectively ecosystems respond to changes linked to biological and non-biological factors.

East Atlantic Flyway: A major bird migration route that extends from the Arctic to Africa.

Ecosystem services: The benefits people obtain from ecosystems, such as clean air, water, food and recreation.

Ecotones: Transition areas between two different habitats or ecosystems.

Endangered: A species facing a very high risk of extinction in the wild.

Environmental Land Management Scheme (ELMS): An agricultural policy for England that pays farmers for environmental benefits.

Embayment: A recess in a coastline forming a bay.

Flood mitigation: The strategies and measures implemented to reduce the impact of flooding on communities and the environment. It includes techniques such as enhancing drainage systems, restoring natural floodplains and constructing levees and flood walls. This aims to prevent flood damage and improve resilience against flood events.

Flood risk management: The assessment and reduction of the risk of flooding to people and property.

Fragmentation: The process by which large areas of habitat are broken up into smaller, isolated patches.

Freeze-thaw cycles: Occur when air temperature drops low enough to freeze water then increases enough for it to thaw again. They usually occur most frequently in the wintertime, though have the potential to occur at any time of year.

Geospatial data modelling: The process of creating and analysing spatial information to understand patterns, relationships and trends.

Green and blue spaces: Areas of vegetation and water in urban environments.

Green infrastructure: A network of natural and semi-natural spaces and corridors in urban and rural areas, designed to provide environmental and quality of life benefits.

Green investment: Funding directed towards environmental and climate-related projects.

Habitat: The natural home or environment of an animal, plant, or other organism.

Habitat creation: The process of establishing new areas suitable for wildlife to live and thrive.

Heritage assets: An item that has value because of its contribution to a nation's society, knowledge and/or culture. They can be physical or non-physical, and generally have cultural, environmental or historical significance.

Hydrological surveys: Investigations into the water-bearing levels of rocks and their capability for filtration under the ground surface within a particular area.

Intertidal mudflats: Coastal wetlands that form when mud is deposited by tides or rivers.

Invasive non-native species: Plants or animals that have been introduced to an area where they do not naturally occur and cause harm to the environment.

Land management: The process of managing the use and development of land resources.

Landscape recovery schemes: Large-scale projects to support long-term environmental changes.

Loam: A soil type composed of mostly sand, with some silt and clay

Local authorities: Administrative bodies responsible for providing local government services and facilities within a specific area, such as counties, districts, or boroughs. They oversee various functions including planning, education, housing, transport and environmental management, playing a crucial role in implementing policies and initiatives that impact their communities.

Local and neighbourhood plans: Documents that set out local planning policies and identify how land is used.

Local Nature Recovery Strategies: Plans developed by local authorities in England to map and improve nature in their areas.

Material consideration: a matter that should be taken into account in deciding a plan-ning application or on an appeal against a planning decision.

Monocropping: the practice of growing a single crop year after year on the same land.

Natural flood management: The use of natural processes to reduce the risk of flooding and coastal erosion.

Nature recovery: The process of helping nature and wildlife return to areas where they have declined.

Nature Recovery Network (NRN): A national network of wildlife-rich places to help nature thrive.

Nature-based solutions (Nbs): Actions to protect, manage, and restore ecosystems that address societal challenges.

Near threatened: A species close to qualifying for or likely to qualify for a threatened category in the near future.

Norfolk and Suffolk Nature Recovery Partnership (NSNRP): A collaboration of organisations working to improve nature in Norfolk and Suffolk.

Nutrient cycling: The movement and exchange of materials derived from inorganic (non-living) and organic (living) matter eg carbon, water or nitrogen. The cyclical path-ways comprise cells, organisms and ecosystems.

Nutrient neutrality offsets: Measures taken to ensure that new developments do not increase nutrient pollution in sensitive areas. For more information visit **http://publications.naturalengland.org.uk/publication/6248597523005440** or relevant local borough or district council websites.

Open Mosaic Habitat (OMH): A mix of bare ground, pioneer communities and more established grassland and scrub.

Paludiculture (or 'farming with high water tables'): System of agriculture for the profitable production of wetland crops by raising the water table whilst reducing greenhouse gas emissions.

Planning authorities: Local government agencies empowered to develop policies and proposals related to land use – they have responsibility for development planning and management and making decisions on planning applications.

'Post-glacial' rebound: The rise of land masses, caused by the melting of ice sheets and loss of their great weight following the last ice age.

Potential measures: The practical actions which, if taken, would contribute towards delivering the priorities.

Priorities: The outcomes which the strategy aims to achieve to benefit biodiversity.

Public bodies: A formally established organisation that is publicly funded to deliver a public or government service, though not as a ministerial department.

Priority habitats: Habitats identified as being the most threatened and requiring conservation action.

Regenerative agriculture: Farming practices that focus on improving soil health, increasing biodiversity and enhancing ecosystem services.

Saline intrusion: The movement of saltwater into freshwater aquifers.

Saltmarshes: Coastal wetlands that are flooded and drained by salt water brought in by the tides.

Sedimentary: Types of rock that are formed by the accumulation or deposition of mineral or organic particles at Earth's surface.

Silt: Granular material of a size between sand and clay and composed mostly of broken grains of quartz, a hard crystalline mineral.

Stepping stones: Anything that will help wildlife to move between isolated fragments of habitat.

Sustainable agriculture: Farming practices that meet society's food needs while preserving the environment.

Strategic significance multiplier: The tool used to calculate the increased relationship between habitat creation and enhancement in areas identified within the LNRS as suita-ble for mapping measures.

Successional or transition zones: The areas that serve as a boundary between two different regions or ecosystems, where characteristics of each intermingle as the process of species within a community change over time.

Sustainable Drainage Systems (SuDS): drainage systems that manage surface water that take into account water quantity and quality (flooding and pollution) as well as biodi-versity and amenity.

The Department for Environment, Food and Rural Affairs (Defra): The UK Government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities.

Urban expansion: The growth and spread of urban areas into surrounding rural or natural land.

Veteran trees: Trees that are old relative to others of the same species and are of particular value to wildlife due to their age, size or condition.

Vulnerable (in context of species conservation): A species facing a high risk of extinction in the wild in the medium-term future.

Water bodies: a significant accumulation of water on the surface of the planet eg oceans, lakes and ponds.

Wetlands: Areas where water covers the soil or is present at or near the surface for varying periods of time during the year.

Wood pastures: Areas of land that combine trees with grazing animals.

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