Suffolk

Local Nature Recovery Strategy

DRAFT

2025

Norfolk & Suffolk Nature Recovery Partnership

Suffolk County Council

Contents

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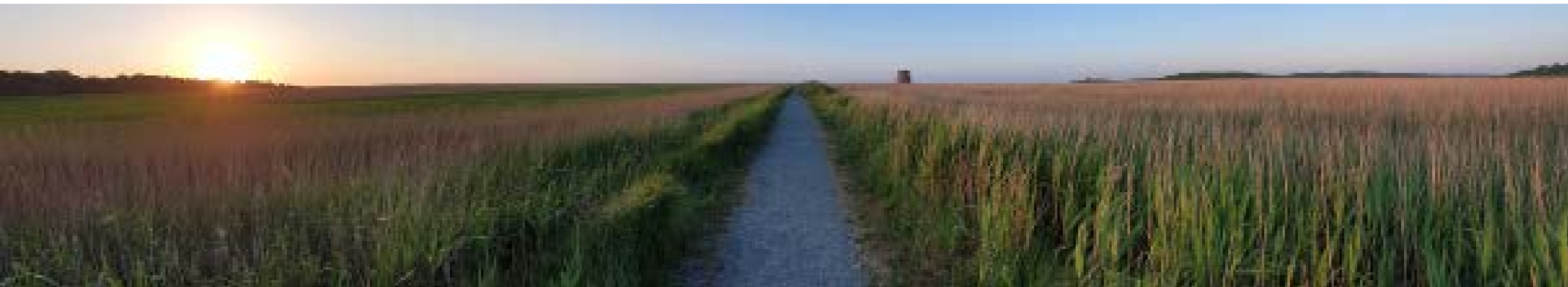
Words or phrases that may require further explanation are highlighted in **bold and underlined** throughout this document and are explained in the glossary at the end.



The sun rises over Westwood Marshes in the Walberswick National Nature Reserve
© Kit Day/SCC

Foreword

Tim De-Keyzer
Head of Natural and Historic Environment, Suffolk County Council
Co-Chair, Norfolk and Suffolk Nature Recovery Partnership

Suffolk's diverse landscape is home to many different species of plants and animals, enriching the lives of those of us who live here, as well as attracting many thousands of visitors every year, who are drawn to its beauty and the opportunities to enjoy wildlife it offers. However, despite many of our wildlife sites being legally protected for decades, the diversity and abundance of nature across the county continues to decline, as the habitats that plants, animals and fungi depend on become increasingly fragmented and isolated.

To reverse this decline, and to ensure that future generations of Suffolk residents and visitors can continue to enjoy and benefit from a thriving and healthy natural environment, we need to reconnect and expand our wildlife areas, linking them through our towns and rural areas to help species to move, to feed and maintain healthy populations. We need to make more space for nature in Suffolk, and to do that in a way that will help nature recover and thrive as quickly and successfully as possible. There is no time to waste.

Focusing our collective actions to have the biggest impact is the purpose of this Local Nature Recovery Strategy for Suffolk. It is one of 48 such strategies covering the whole of England, which for each county identify priority areas for actions to support the recovery of nature. These will help to reverse the decline of many species, both locally and nationally, through extending and linking habitats, improving the condition of locally important habitats and creating new 'stepping stones' of habitat in areas where there is little connectivity at present. The strategy also identifies opportunities to deliver the wider environmental benefits that nature provides, such as flood mitigation, alongside improvements for wildlife.

This Local Nature Recovery Strategy for Suffolk is the result of a huge amount of collaboration between many organisations and individuals, all of whom have an interest in and a role to play in helping Suffolk's nature to recover. This has been coordinated through the Norfolk & Suffolk Nature Recovery Partnership, led by Norfolk and Suffolk County Councils, who are the responsible authorities for producing the Local Nature Recovery Strategy for their respective counties. This collaboration will continue through the partnership to promote and support the delivery of the priorities and measures set out in the strategy. These focus on actions that can be taken 'on the ground' in Suffolk to help our nature recover and on areas where these actions could have the most significant benefit for nature. There are also many actions that will support nature recovery widely across the county, which everyone can help play a part in.

Nature is critical to all of our lives, and its health and diversity is vital to our ability to limit and adapt to the impacts of a changing climate on Suffolk. The engagement and contributions made to this strategy are testament to the value of collaboration and partnership, and we need to continue to harness and build on that shared commitment to deliver the ambitions set out within it; working together across our communities and with our farmers and land managers, and with businesses, and health providers, and our schools and local government to achieve the recovery of nature in Suffolk.

Suffolk is home to several fine ancient woodlands, often indicated by the presence of bluebells in spring.
© Kit Day/SCC

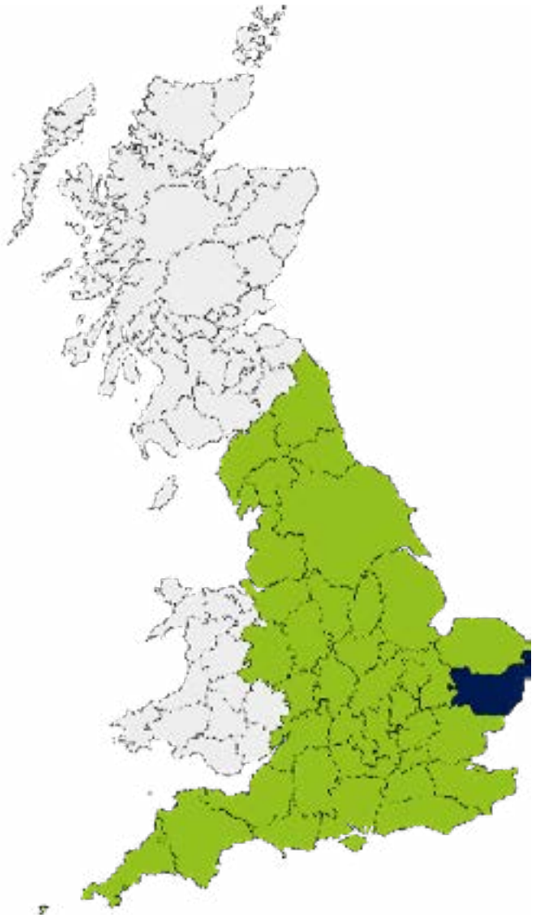
What is nature recovery?

Nature recovery creates and restores **habitats** and **biodiversity** eg 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, soil health and 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. Cross-sector collaboration that combines local knowledge and science helps revive Suffolk's nature in harmony with its rural economies and cultural heritage.

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



What is an LNRS?

(LNRSs) are a new approach to restoring and protecting nature in England.

Local Nature Recovery Strategies (LNRS) are part of a national push to give nature more room to grow. They are a requirement of the Environment Act 2021. They focus on highlighting and revitalising our natural habitats across Suffolk, including:

- mapping existing important natural areas
- planning where and how to establish or connect habitats, benefiting both nature and people.

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

These aim to expand, improve, and link natural areas, guiding the implementation of environmental priorities and funding like **Biodiversity Net Gain** (BNG). The LNRS will determine where habitat creation or enhancement will be of 'high strategic significance' a 15% uplift in the biodiversity metric will be applied if the measures and actions set out in the

Overview of Suffolk's LNRS area

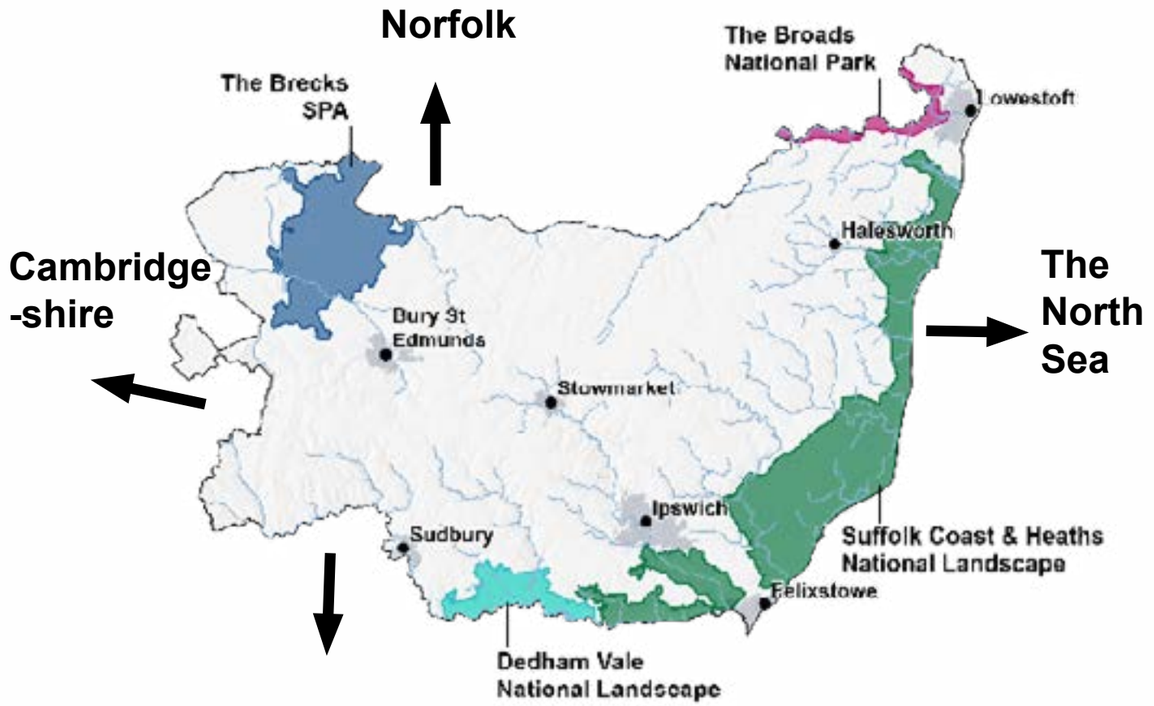


Figure 2. Map of Suffolk's LNRS area showing key landscapes: the Brecks, the Broads, Suffolk Coast and Heaths National Landscape, Dedham Vale National Landscape and major waterways

Who created Suffolk's LNRS?

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

- District and Borough Councils
- Broads National Park
- Suffolk & Essex Coast & Heaths National Landscape
- Dedham Vale National Landscape
- Stour Valley National Landscapes
- Nature conservation organisations
- Landowners and land managers
- Local people, groups and stakeholders
- Private companies and local businesses

Working with neighbouring Norfolk County Council, the Suffolk and Norfolk 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 Essex and Cambridgeshire has ensured cohesion across shared boundaries.

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 Suffolk

Planning Norfolk

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.

Suffolk 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

Funding to support the creation of Suffolk's LNRS has been provided by The Department for Environment, Food and Rural Affairs (Defra).

Suffolk Wildlife Trust Wild Tots group enjoy bug hunting
© John Ferguson/SWT

How can the LNRS support the people of Suffolk?

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

For everyone in Suffolk 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.

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:

- help to ensure planning decisions are informed by nature recovery priorities and follow best practices for enhancing biodiversity
- assist in aligning and preparing local and neighbourhood plans, **green infrastructure** delivery, contributing to Suffolk-wide collaborative action between **local authorities** and ensuring development uplifts and safeguards the county's natural assets
- support decision making for off-site potential for BNG
- provide a series of 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 and developers have a legal requirement to ‘take account’ of the content of the LNRS, to ensure nature recovery is properly reflected in the planning system. Appropriate guidance related to this requirement will be incorporated into this document where possible before finalisation.

For local businesses the LNRS:

- signals Suffolk 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.

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.

We focus 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 we run social events, guided walks, talks and an annual art exhibition.

Our core aim is the creation and restoration of wetlands including rare calcareous fen habitat of national significance for its plants. All of our work is based on the principle of ‘people working with and enjoying nature’ both to restore and offer access to tranquil countryside.

Who is involved?

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

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

Species rich vegetation at New Fen after restoration.
© LOHP

Volunteers clearing fen vegetation
©LOHP

What have we achieved?

We 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, our 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. we are contributing to the development of WaLOR to ensure our 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 by visiting www.lohp.org.uk

What the LNRS is not aiming to achieve

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 – 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 (e.g. 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.

A bumblebee on a cornflower
© Steve Aylward/SWT

Images on page 15. European eel © Jack Perks/NWT, Starry Breck-Lichen © Annie Evankow/iNaturalist, Barberry carpet moth © Alex Hyde/Back from the Brink/ Flickr, Turtle dove © Garry Huston/NWT, Suffolk lungwort © Wild Flower Web, Natterjack toad © Philip Precey

Why does nature in Suffolk need recovering?

Suffolk'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. 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. Among UK species in Suffolk that are classified as **critically endangered** are:

- European eel
- Starry Breck- Lichen
- Turtle dove

Among those on the **endangered** list in Suffolk are:

- Barberry carpet moth
- Suffolk lungwort
- Nutterjack toad

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, the UK overall has seen significant habitat impacts, with only one in seven habitats assessed as being important for wildlife reported to be in a good condition.

European eel
Anguilla anguilla

Starry Breck-Lichen
Pelophylax lessonae

Barberry carpet moth
Buellia asterella

Turtle dove
Streptopelia turtur

Suffolk lungwort
Pulmonaria obscura

Natterjack toad
Epidalea calamita

What can nature recovery do?

Maple farm

Maple farm is a 400-acre, family-run farm in Kelsale, Suffolk. Organic for over 20 years, our hens roam freely, our meadows are grazed by visiting herds of sheep and cattle, and our market garden produces year-round fruit and vegetables in soils enriched by green manures, composts and compost teas.

Research suggests that organic farming, ie without pesticides or herbicides, helps the most threatened wildlife species to survive and recover. Organic farming using regenerative farming methods enables us to produce food, capture carbon and build biodiversity all at the same time.

How did we do it?

We use regenerative organic methods to improve soil health, boost water retention, and support natural insect predators.

We purchased a stone flour mill which allows us to sell our own grain as flour, increasing our margins. We also ended up with lots of byproducts to feed our free-range hens leading to our soya-free egg production. This, in our own small way, addresses the global issue of widespread and destructive soya production for livestock feed.

Creating healthy, fertile soil
We have prioritised soil health – planting fields with deep-rooting, fertility building crops like Clover and grazing these with our hens or other livestock to improve soil structure and drainage. We rarely plough fields and if we do we practice shallow ploughing to maintain soil structure. We only use small machinery to avoid compacting the land.

Intercropping
We grow a wide range of different crops, often side by side to compliment and protect each other eg. Tomatoes and basil. This helps to keep plants disease and pest free without having to use pesticides.

Agroforestry
We have planted thousands of trees in rows within our fields. These trees help to maintain optimum soil temperatures, moisture and fertility. They store carbon, provide diverse habitats for beneficial insects to support nearby crops, and they give shade and shelter to our hens. In time, they'll provide valuable timber and nuts and apples.

Conservation and restoration
We have replanted many miles of hedgerows and hedgerow trees, vital habitat for Nightingales. We have created over ten miles of wildflower and grass field margins, restored many ponds (we have 32 natural dew ponds in total) and we retain stubbles over the winter months for wild bird habitats and plant areas specifically for winter bird feed. We have restored permanent pastures and left wild many spaces where life can thrive undisturbed.

Find out more by visiting www.maplefarmkelsale.co.uk

Case Study

What have we achieved?

The fields of flowering vetches and clovers are a haven for different species of threatened bees and other pollinating insects. We are host to many bird species, including yellowhammers, nightingales and skylarks, which have been victims of modern agricultural methods.

Our ponds welcome wildfowl, while on and beneath the water we find great crested newts, grass snakes, dragon and damsel flies.

We create good jobs in the countryside and we supply healthy food for our community. Most of what is grown is sold through the Maple Farm store. The rest goes to local restaurants and a few shops who want to support local production.

CAPTION:

What's next?

We will continue to develop the farm and share our experiences with a growing number of farmers that are interested in these techniques. We are keen to support the development of farm clusters that will be vitally important to promote farming methods that encourage the recovery of nature and that maintain and support rural jobs and communities.

We will continue to innovate to find new profitable niches such as growing wildflower seed and other high value crops. We want to prove that small family farms can be very profitable if they behave differently.

Part A: Strategy Area Description

“There is a hint of wildness in Suffolk's tamed beauty, and the tang of the North Sea is never far away.” - Patricia Moyes

Suffolk is an undulating county of low rolling hills and a central plateau, split by meandering river valleys. The county is bookended in the east by the Suffolk estuaries and a dynamic coast, and in the west by the sandy Brecks, The Fens, and the chalk hills that further west become the Chilterns. Much of the land is low-lying, nowhere more than 128 metres above sea level, and an average elevation of 35metres.

Suffolk’s habitats and species reflect its variable geology and soils as well as centuries of human occupation and modification through farming, forestry and settlement. This interaction has shaped the patchwork of habitats accross our estuaries, wetlands, open coast, heathlands, meadows, woodlands and farmed countryside that we see today.

Nature conservation action in Suffolk has a long history, having provided the country with some of its earliest nature reserves and conservation success stories. In the 1930s and 40s, the RSPB purchased North Warren reserve in Aldeburgh and began managing the now famous coastal wetlands at Minsmere, purchasing Havergate Island on the River Ore in 1948. The wealth of wildlife and habitats in Suffolk is reflected in the 38,458 hectares under one or more nature designation, some 10.1% of the total county land area.

The wide expanses of Suffolk’s shingle beaches, like this one in Aldeburgh, provide a vibrant ecosystem for diverse species, from nesting seabirds to coastal flora.
© Ian Howard/Adobe Stock

The geology underlying Suffolk's habitats

Suffolk is underlain by layers of **sedimentary rock**, primarily sandstone, chalk, clay and crag. In turn, this is covered with varying depths of glacial sands and gravels, estuary **silts** and **loam-rich soil**. 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 Broads 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 store more carbon than all other vegetation types in the world combined.

Much of Suffolk's sedimentary rocks hold water as **aquifers**, providing groundwater that issues out as springs and seepage for rare fen, bog and marsh habitats, and, ultimately, into the rivers. These aquifers are a precious natural resource, providing water for agriculture, industry and domestic use. The sandier soils of Suffolk have historically lent themselves to heaths and warrens, and more recently as commercial forestry or **arable**.

Suffolk'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 well-being, adapting effectively to environmental changes. and ensuring community well-being, adapting effectively to environmental changes.

Figure 3. Map of Suffolk's National Character Areas (NCAs) highlighting distinct regions reflecting unique geographical and ecological characteristics.

Cliffs at Covehithe reveal the geological layers below the ground's surface
© Nimur/Adobe Stock

Suffolk's coast

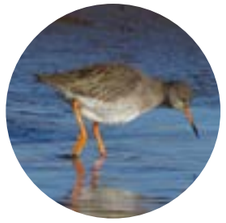
From the sandy cliffs of Pakefield in the north of the county, to Brantham on the Stour Estuary, Suffolk's coast is one of England's most naturally dynamic coasts, supporting a range of wetland, saltmarsh, dune, shingle, mudflat, and soft cliff habitats. It stretches for nearly 60 miles and hosts some of the nation's most famous coastal wetland nature reserves in Benacre, Minsmere and Orfordness.

The relationship between the coast and adjacent wetlands is a delicate balancing act. To protect established and thriving communities from coastal erosion, where occasionally tens of metres can be lost in a single storm event, sea defences are erected, but inevitably shift the natural erosion forces of the sea to other areas, risking the sediment flow round our coastline. Sediment, released from coastal erosion, nourishes the barrier dunes and shingle, which, in turn, protects wetlands teeming with birds and wildlife. Thousands of waders and wildfowl feed on the pools and lagoons, bittern, marsh harrier and bearded tit make the reedbeds their home, while the beaches are a home for breeding shorebirds like ringed plover and little tern. The shingle beaches and ridges have a unique flora and are speckled with tough pioneer plants like the yellow-horned poppy in late summer.

The five great estuaries of the Blyth, Alde-Ore, Deben, Orwell and Stour are one of Suffolk's most famous natural features. Together, they represent some of the largest concentrations of inter-tidal habitat in England, home to internationally important numbers of breeding and wintering birds, and important saltmarsh habitats that help provide flood protection from the sea, in front of the low-lying floodwalls. These areas are part of the **East Atlantic Flyway**, the migratory route linking the Arctic to Africa, and are currently under consideration for UNESCO World Heritage status.

Species found on Suffolk's coast

Little Tern
Sternula albifrons



Redshank
Tringa tetanus

Sea Pea
Lathyrus japonicus

Yellow Vetch
Vicia lutea

Little tern © Simon Stobart/Adobe Stock, Redshank © Bob Chappell, Sea Pea © tamu/Adobe Stock, Yellow Vetch ©

Did you know?
Suffolk contains 15% of England's vegetated shingle habitat, the vast majority of which is found in north-west Europe, Japan and New Zealand.

Sand dunes, like these near Lowestoft, are an iconic feature of the coastline, but many do not realise they are a key successional habitat and are home to many unique and important species.
© Jevanto Photography/Adobe Stock]

Coastal pressures

The Suffolk coast, measuring approximately 60 miles from Felixstowe in the south to Lowestoft in the north, 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, which make up 9.6% and 9% of the UK's total, respectively.

The region's water systems are also under considerable strain. Suffolk and Norfolk, 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. These shifts in geographic and climatic factors 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 dune 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
- **sustainable fisheries management** can lead to a reduction in prey species for some of our important fish-eating bird species.

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

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

Strategy Area

Port of Felixstowe cranes overlooking Trimley Marshes Nature Reserve, Suffolk Wildlife Trust.
© Suffolk Wildlife Trust

An example of Suffolk's coast: The Alde-Ore estuary

One of Suffolk's five great estuaries, the Alde-Ore, is a sweeping majestic land and seascape, with the broad curve of the Alde bending to the south by Aldeburgh and taking its long, winding journey to the sea at Shingle Street. The broad estuary landscape and the tang of salt extends as far inland as Snape, where large reedbeds give way to saltmarsh and mudflats full of wintering waders and wildfowl. The floodplains along the river support wet grasslands, while to the south the river meets the vast shingle spit of Orford Ness, with its rare shingle flora, breeding waders among the ghosts of its Cold War past.

The estuary itself is vulnerable to storm surges and tides. In 2013, seawalls were breached at Hazelwood Marshes, so severely that difficult decisions were made to allow the sea back on to the land. Nature has been quick to adapt and bounce back, with a new inter-tidal marsh gathering sediment, creating new mudflats and embryonic saltmarsh.

Strategy Area

The meandering River Alde passing by Orford Ness
© Ronnies-creatives/Wirestock Creators/Adobe Stockz

Suffolk's farmland

Strategy Area

Suffolk is predominantly shaped by farming, with around 75% of land in agricultural use. Arable cultivation dominates but with important areas of livestock farming, root and salad crops and horticulture. Intensification has resulted in significant changes in the farmed landscape, but remnants from earlier days remain, such as irregular patchwork of ancient hedgerows dotted with veteran trees, drove roads, old veteran trees and ponds.

Farmland is home to habitats important to many species, and its productivity is reliant on nature for many things, including pollination of crops, healthy soils and availability of clean water. Parts of Suffolk remain a stronghold for rare arable plants and farmland birds like turtle dove, tree sparrow and grey partridge that are in decline elsewhere. In Suffolk we have many great examples of how nature and farming can be successfully integrated with one another. Nationally, the 2021 farmland bird index, which is a good indicator of general biodiversity on farmland, shows that the numbers of all farmland bird species have more than halved since the 1970s.

Agricultural land, which covers much of the county, offers huge potential for nature recovery actions through sustainable farming practices
© Pawel/Adobe Stock

Species found on Suffolk's farmland:

Kestrel
Falco tinnunculus

Barn owl
Tyto alba

Corn bunting
Emberiza calandra

Shepherd's needle
Scandix pecten-veneris

Images above: Kestrel © Martin Grimm/Adobe Stock; Barn Owl © bridgephotography/Adobe Stock; Corn bunting © Volodymyr Kucherenko/Adobe Stock; Shepherd's needle © ChrWeiss/Adobe Stock

Farmland pressures

Suffolk and Norfolk 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). However modern farming practices and land management techniques can impact the biodiversity and soil productivity of our farmland.

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

- **intensive farming practices**, such as use of pesticides and fertilizers, 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 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

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

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

CAPTION
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An example of sustainable farming in Suffolk: Shimpling Park Farm

Strategy Area

Under-sown clover growing through a crop of spring barley on Shimpling Park Farm
© John Pawsey

Taking the decision at Shimpling Park Farm to farm organically and changing the farming system over 20 years ago has resulted in healthier soils, more nature, an enlightened workforce and a more stable farming business.

Bringing herbal leys and livestock back into the system, coupled with green manures and cover cropping, has increased the soil's organic matter as well as its health.

Not using pesticides or chemical fertilisers has meant that rotations have had to be longer with the use of an increasing number of crops sown in equal measures of winter and spring cropping, which has helped to increase biodiversity on the farm as well as prevent any one pest, weed or disease from dominating.

Increased complexity has been a challenge for the owners as well as the staff at Shimpling Park Farm, meaning that they have become accustomed to change and indeed thrive on it, making the business resilient and more sustainable in times when our farmers are being asked to produce more than just food.

Woodland, trees and scrub

Suffolk boasts some of East Anglia's most important remaining **ancient woodland**, and wood pasture with old veteran trees. This includes wet woodlands known as carrs, normally comprising alders, willows and birches, areas with scattered 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.

The heavy clay soils of north and mid-Suffolk are scattered with ancient hornbeam, oak and ash woods, many with a history of active coppicing and pollarding, often linked by a network of hedgerows. Although Suffolk has over 450 ancient woodland sites, some have been reduced in size and changed to monocultural and even aged plantations with little resilience to climate change and pests and diseases. Generally the woodlands are under intense browsing pressure from increased deer and squirrel numbers. Where active management has resumed, coppicing has brought structure and light to the woodland floor and ground flora and bird life has returned, creating safe nesting and perching opportunities for nightjar and woodlark.

Wood pasture and medieval deer parks such as Staverton Thicks supports old veteran trees and ancient pollard, which hosts rich insect fauna, owls and other birds. Many of Suffolk's oldest trees are found in some of the county's estate parklands and large historic designated landscapes associated with stately homes such as Heveningham, Ickworth and Clare Castle.

Autumn in Tunstall Forest.
© chillingsworth/Adobe Stock

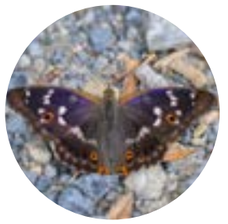
Suffolk hosts a variety of traditional orchards, from majestic standard cherry trees gracing parklands in the south to ancient cobnut coppices, and quaint farmhouse orchards adorned with a diverse mix of fruit trees. Urban trees, often hardy species like silver birch and London plane, play a crucial role in cooling, air quality and wildlife habitat.

Scrub is a transitory stage between open habitats such as grassland and closed canopy woodland. It plays a crucial role in supporting a broad range of wildlife, providing a continued source of nectar, fruits, seeds, shelter, breeding and roosting sites.

Nightingale are summer visitors to Suffolk, for example Arger Fen and Black Bourn Valley, where scrub habitats are increasingly important, as they prefer thickets of dense blackthorn and bramble, with a margin of rough grass.

Oak
Quercus robur

Barbastelle bat
Barbastella barbastellus



Purple Emperor Butterfly
Apatura iris

Black Poplar
Populus nigra subsp. Betulifolia

Invasive species

Muntjac deer
Muntiacus reevesi

Grey squirrel
Sciurus carolinensis

Images: Sessile oak © NWT, Barbastelle bat © Adi Ciurea/Adobe Stock; Purple Emporer Butterfly © Stefan/Adobe Stock; Black Poplar © Steven Falk; Muntjack deer, Grey Squirrel © Amy Lewis/NWT

Woodland, trees and scrub pressures

Woodlands in Suffolk 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. 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.

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 Suffolk's woodlands, alongside urban trees and those found outside of 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 nsnrp.org/publications or scan the QR code.

Strategy Area

Enjoying a Suffolk woodland – Striking a balance between conservation and providing access to nature.
© Cristina/Adobe Stock

An example of Suffolk's woodland, trees and scrub: Bradfield Woods

Strategy Area

Bradfield Woods is a National Nature Reserve in West Suffolk. This ancient woodland covers 70 hectares and has a rich history of continuous traditional coppice management since 1252. Coppicing involves cutting stems at ground level to promote vigorous regrowth. Remarkably, some ash coppice stools here are believed to be over 1000 years old.

The dense, bushy growth from regenerating shoots provides cover for migrant songbirds like garden warblers and blackcaps, while mammals such as stoats, yellow-necked mice, dormice and badgers can be found here. On sunny days, the sheltered woods become a habitat for 24 butterfly species, including the elusive white admiral and purple hairstreak.

The Bradfield Woods National Nature Reserve, managed by Suffolk Wildlife Trust, contains some of Britain's finest ancient woodlands, which has been under continuous, traditional coppice management since 1252.
© John Ferguson/SWT]

Freshwater habitats

Freshwater habitats include rivers and streams, freshwater reed bed 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 control.

In the north of the county, the River Waveney flows eastwards as part of the Broads catchment, from its origins in the spring-fed valley fens scattered around its headwaters. As they travel seaward, the Waveney and the other east-flowing rivers, like the Hundred Stream, open into wide floodplains, on peat, silt or clay. These support a mosaic of wet grassland, reedbeds, wet woodland, coastal flood plain and grazing marsh and occasional fen habitats. They are the drainage axis for much of Suffolk's hinterland.

Suffolk's chalk streams, such as the Little Ouse and Lark, make up some of the 39 streams feeding into the River Ouse. These flow westwards through The Brecks with adjoining wetlands and heathland habitats and eventually into the Fens. 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.

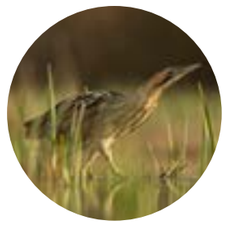
The low-lying landscape and shallow river gradients mean that saltwater often penetrates upstream, and flooding can occur when freshwater is 'locked' upstream on high tides, or barred by barrier beach sediments, although this is an entirely natural process. The frequency of these events is increasing with sea-level rise due to climate change. The main rivers themselves, especially the Stour, Gipping, Deben, Alde, Blyth, Lark, Dove and Waveney support increasingly broad floodplains towards the sea. Some of the broader river valleys, like the Lark, 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.

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. Suffolk has 22,000 farmland and village ponds; however, many of these require restoration to reinstate their ecological value.

Species associated with Suffolk's freshwater:

Water Vole
Arvicola amphibius

Frogbit
Hydrocharis morsus-ranae

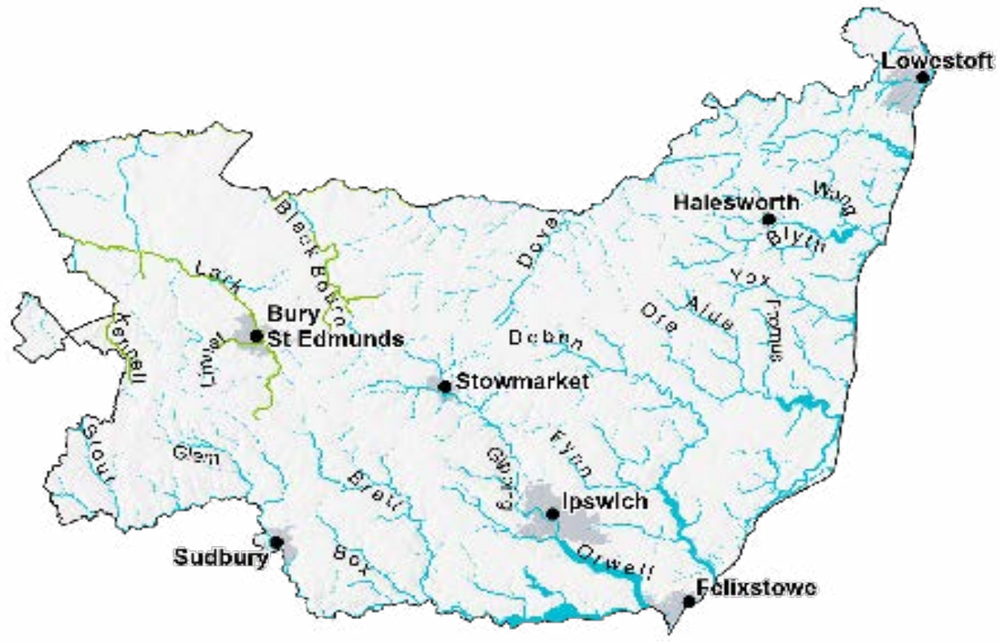


Bittern
Botaurus stellaris

Great crested newt
Triturus cristatus

Images above: Water vole © NWT; Frogbit © nahhan/Adobe Stock; Bittern © Jamie Hall/NWT; Great crested newt © Tiberiu/Adobe Stock

Figure 4. Map of Suffolk's waterbodies and rivers.



The River Waveney flows through east Suffolk, here passing by Wainford
© Edwin/Adobe Stock

Did you know?
85% of the world's precious chalk streams are found in England, and Suffolk is home to some fine examples of these, such as the Rivers Lark and Little Ouse.

Freshwater pressures

Freshwater systems in Suffolk 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 Suffolk due to diffuse pollution from agriculture, urban runoff, and point-source contaminants like untreated sewage and industrial discharges.

Flood risk is another significant pressure, with over 11% of Suffolk and Norfolk 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.

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
- **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 fenland 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 Suffolk's freshwater ecosystems. Opportunities to strengthen habitat resilience and improve water management are discussed further in **Part B: Opportunities Identified.**

Strategy Area

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

The nutrient-rich waters of the River Lark, a classic chalk river, flows through modified channels in Bury St Edmunds.
© Rob/Adobe Stock

Case Study

Awaiting case study of Suffolk's freshwater habitats

Case Study

Strategy Area

Grassland and heathland

The Suffolk coastal fringe supports an extensive network of pre-enclosure heath, warrens and commons. Together, these make up some of England's largest remaining areas of lowland heath. They are often embedded in the landscape alongside wetlands and estuaries, such as at Dunwich and Minsmere, or forestry and arable farming, such as at Tunstall.

Suffolk's meadows, once a part of every farm, are woven into our cultural fabric. These flower-rich expanses developed alongside humans due to livestock grazing and cutting for hay. The west of the county is home to areas of calcareous grassland due to the underlying chalk soils and, in the Brecks, these are often found close together in mosaics with acid grasslands due to the unusual geology of the area. It is estimated that more than 97% of the UK's species-rich grassland has been lost since 1930 and, in Suffolk, such habitat is generally confined to highly fragmented areas and marginal land, such as roadside verges.

Species found on Suffolk's grassland and heathland:

Woodlark
Lullula arborea

Nightjar
Caprimulgus europaeus

Military Orchid
Orchis militaris

Heather
Calluna vulgaris

Did you know?
Between the Brecks and the Sandlings, Suffolk supports over 25% of England's acid grassland habitat.

Images: Woodlark © Stefan Johansson/NWT; Nightjar © Grzegorz/Adobe Stock; Military orchid © ChrWeiss/Adobe Stock; Heather © fotografiecor/Adobe Stock

The dry grassland at Carlton Marshes, managed by Suffolk Wildlife Trust, is highly important for biodiversity as they provide habitat for a wide range of plant and animal species
© SWT

Grassland and heathland pressures

Grasslands and heathlands in Suffolk 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, sandy soils, these habitats are home to a vast range of plants such as heathers, gorse, wildflowers and grasses adapted to acidic their specific conditions.

Lowland heath and dry acid grasslands are now rare, making up just 0.5% of England's land area. However, Suffolk, along with Norfolk, 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 Suffolk & Essex Coast and Heaths National Landscapes, highlighting their importance locally and nationally.

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. For example, nationally, 85% of heathland and 96% of lowland hay meadows have been lost over the last 150 years and only 8% of Sandlings' heaths remain, affecting connectivity
- **climate change** 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 higher frequency of fires (due to higher temperatures).

Addressing these pressures requires focused efforts to restore and enhance Suffolk's grasslands and heathlands and strategies to achieve this 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 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.
©Nick Ford/ The Brecks: Fen Edge & Rivers Landscape Partnership

An example of Suffolk's grassland and heathland: Suffolk Sandlings

The Suffolk Sandlings is an area of light sandy soils in south-east and east Suffolk, formed from material washed out from the ice sheet during the last ice age, between 10,000 - 70,000 years ago. This unique landscape, once dominated by woodland, now hosts a rare wildlife habitat - heathland, which has a unique flora and fauna. However, the extent of this habitat has declined by 70% in the last century alone, and 86% since the mid-1700s, making its protection and enhancement crucial.

In recent decades, efforts have been made by farmers and conservation bodies around these places to restore the former heaths where they had been previously reclaimed for forestry or arable farming. This is starting to reduce the fragmentation, as former sandy and poor, marginal arable fields are restored to grass and heath.

The frost covered Upper Hollesley Common provides vital habitat for a variety of species throughout the year.
© Kit Day

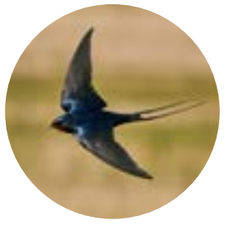
Urban and built environment

By English standards, Suffolk is still a relatively rural county. However, our built environment provides an important part of our natural heritage, not least for the habitats and species it supports. Crucially, it brings nature close to where people live in Suffolk's many towns and villages, allowing them to access and connect with the green and blue spaces.

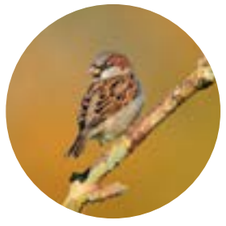
Among our more urban areas, Ipswich has the Orwell estuary on its doorstep, the Gipping River corridor, heathlands on its eastern fringes, and impressive parkland open spaces like Christchurch and Orwell Country Park, bringing nature in and around the town centre. The habitats of Carlton Marshes, Belton Forest and Fritton Lake are all close to Lowestoft, while the town itself supports green spaces and Oulton Broad, a reminder of the town's position at the seaward end of a former Broads estuary. Many of our historic market towns such Bury St Edmunds, Sudbury, Stowmarket, Halesworth and Bungay are located along rivers, crucial arteries connecting nature and people throughout the county. Finally, Newmarket and the surrounding areas, known as the headquarters of British horse racing, offer potential for habitat creation.

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, hedgehogs and starlings are prime examples of this, but it is also true of some more endangered species such as swifts, utilising the skies above our towns and villages in the early summer.

Weaving nature into high quality design for housing, road, rail and energy infrastructure projects helps create nature rich places. When combined, 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.



Swallow
Hirundo rustica



House Sparrow
Passer domesticus

Hedgehog
Erinaceus europaeus

Swift
Apus apus

Images: Swallow © dennisjacobsen/Adobe Stock; House sparrow © Kit Day; Hedgehog TBC; common swift © Kit Day

Urban parks, such as Christchurch Park in Ipswich, offer great opportunities for urban-based nature recovery action as well as providing access to green space.
© Rob/Adobe Stock

Urban and built environment pressures

In 2021, Suffolk had a population of 760,688, which is projected to increase to 828,710 by 2043. Just under 20% of this population resided in the urban area of Ipswich, with the total urban population being approximately 60% of the total population. 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:

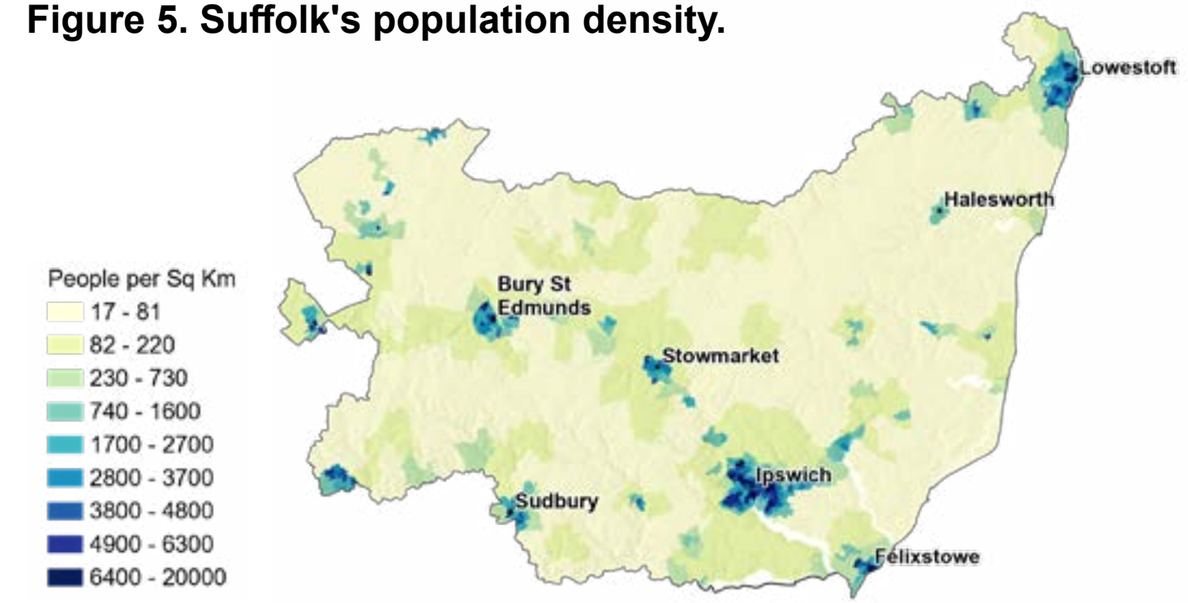
- **urban expansion** often leads to the destruction and fragmentation of natural habitats, making it difficult for species to survive and thrive
- **air, water and soil pollution** icaused by transport, construction and other infrastructure in urban areas, can harm wildlife and degrade natural habitats
- **heat islands**, due to human activities and infrastructure, mean urban areas tend to be warmer than their rural surroundings, 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.

Strategy Area

Figure 5. Suffolk's population density.



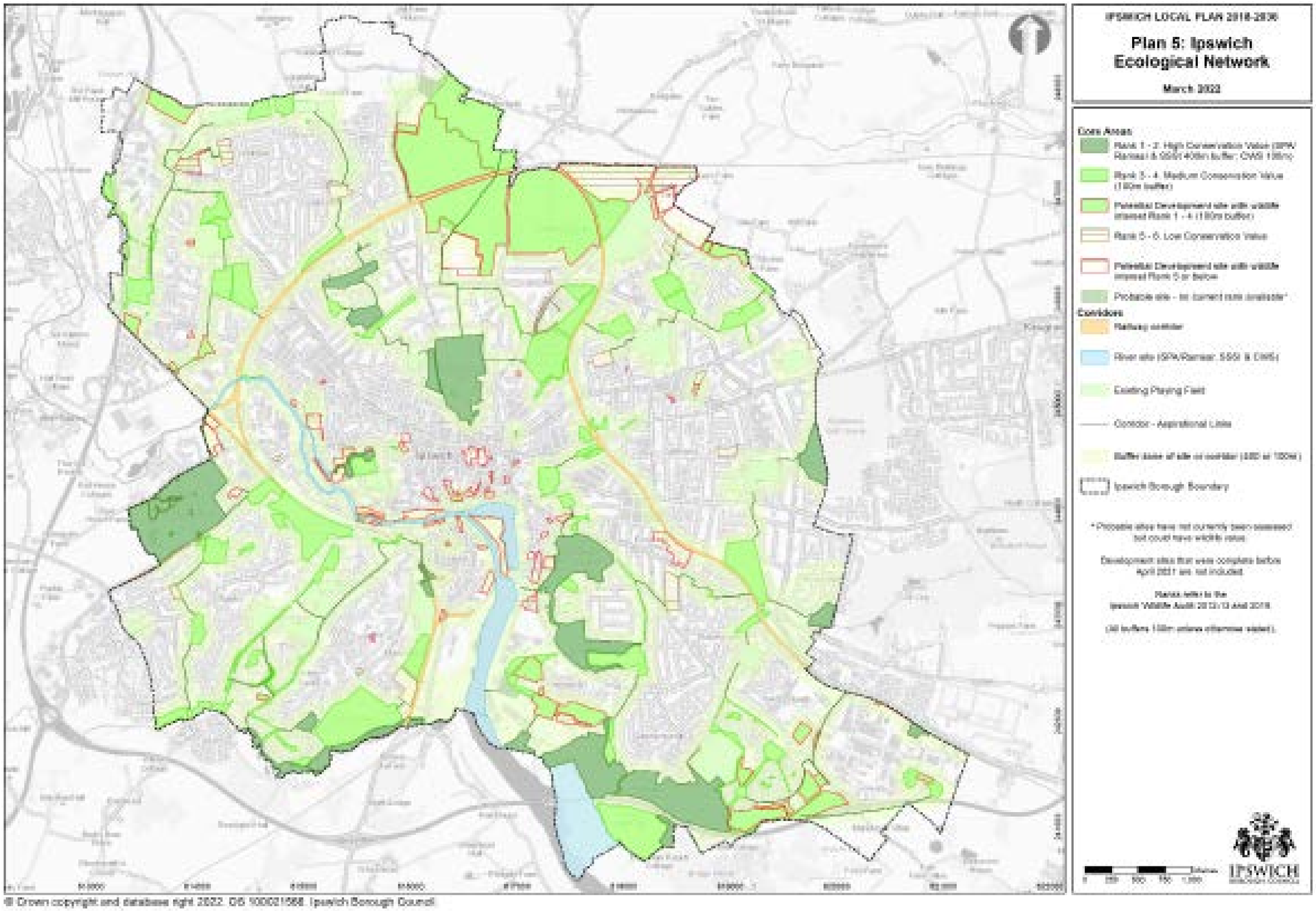
Busy roundabouts increase artifical light and noise which can interfere with the natural behaviours of wildlife
© Rob/Adobe Stock

An example of nature recovery in a developed area: Ipswich Greenways

“Knowing what natural resource we had was the logical first step in the long journey of trying to maintain and enhance the biodiversity value of the town.”

The Ipswich Ecological Network Map was created in 2014 following detailed site surveys of every significant green space in the town by Suffolk Wildlife Trust. The map shows all the ‘core sites’ (parks, nature reserves, allotments etc), along with corridors linking them together. Within the Local Plan context, the sites and corridors have a policy to protect corridor function and encourage enhancement through any developments.

The map clearly shows the vital importance of private gardens along with school grounds, business premises and smaller public green spaces – and it has highlighted the importance of working in partnership with other organisations and individuals to achieve as many wildlife benefits as possible. The Ipswich Borough Council Parks Service and Greenways Countryside Project have used the network map to focus resources and encourage public participation. Many ‘Wildlife Homes’ events, in partnership with Ipswich Wildlife Group, have allowed local people to make bird boxes, bug hotels, hedgehog houses and other ‘biodiversity features’ to take home to put in their gardens – with the idea that all the small efforts made by lots of people gradually, yet significantly, improve the diversity and value of the network.



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Distinct areas: The Broads

The Waveney Valley, to Bungay, forms the southern arm of the Broads National Park, one of Britain's most famous and biodiverse wetlands. The Waveney (and Little Ouse heading east) defines the boundary between Suffolk and Norfolk, linking with a network of tributary rivers through much of north Suffolk. The area supports a diverse patchwork of peat fens, reedbeds, wet woodlands and wet grasslands. The marshes of the lower Waveney floodplain support large wetlands, many now being managed at landscape scale and enhanced for wildlife.

Rare and threatened species such as fen raft spider, water vole and bittern are the subject of intense conservation action, and the recovery of the bittern and marsh harrier from near extinction are two recent species recovery success stories.

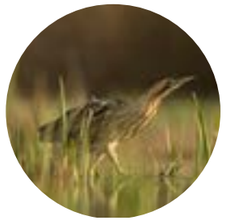
But the Broads are also an important economic resource and the area is under intense pressure, from recreational use, water quality and demand, flooding, drought, and the necessity to respond to sea level rise and climate change.

Find out more by visiting www.broads-authority.gov.uk

Swallowtail
Papilio machaon

Little whirlpool ramshorn snail
Anisus (Disculifer) vorticulus

Fen orchid
Liparis loeselii



Bittern
Botaurus stellaris

Marsh harrier
Circus aeruginosus

Common crane
Grus grus

Herrinfleet Mill on the Suffolk Broads
© Beck/Adobe Stock

Images above: Swallowtail © NWT; Lesser whirlpool ramshornsnail © Alex Hyde/Back from the Brink/Flickr Fen orchid © Tony Martin Long/Adobe Stock; Bittern © Jamie Hall/NWT; Marsh harrier © David Tipling/NWT and Common crane © Stefan Johansson/NWT

Distinct areas: The Brecks

Straddling the border between Suffolk and Norfolk, The Brecks are one of England's most biodiverse regions. The landscape is one of the driest parts of England, but supports an incredible mosaic of woodland, heathland, rivers, wetlands and farmed land. The region is home to an incredible 2,149 priority species many of which are nationally rare, scarce, or threatened and of which the Brecks supports all or a large part of what remains. This includes rare birds of forest and open country such as stone curlew, woodlark and nightjar, and many rare plants of heath and cultivated land.

The Brecks' conifer woods, planted for commercial purposes in the twentieth century, have become a distinctive part of the landscape. However, the open heath areas are now limited and are mostly found within protected areas. This situation persists despite efforts to create corridors of these habitats into forest management.

The Brecks' unique natural 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 freezing and thawing 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 twentieth century but has been re-introduced at two Brecks sites.

Pingo ponds in Thetford Forest
© Mike Page

Find out more by visiting www.brecks.org

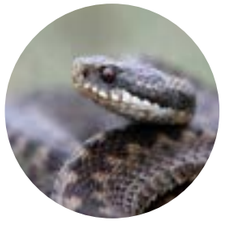
Stone curlew
Burhinus oedicnemus

Woodlark
Lullula arborea

Nightjar
Caprimulgus europaeus

Creeping marshwort
Apium repens

Spring speedwell
Veronica verna



Adder
Vipera berus

Images: Stone curlew © NWT; Woodlark © Stefan Johansson/NWT; Nightjar © Grzegorz/Adobe Stock; Creeping marshwort © Freshwater Habitats Trust; Spring speedwell © Andreas Rockstein and Adder © Erni/Adobe Stock

Case Study

Conserving the Brecks

The Brecks Fen Edge and Rivers landscape partnership

The Brecks is landscape spanning 393 sq. miles across Suffolk and Norfolk. 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 we 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.

Ariel photograph demonstrating river restoration improvement works (right) carried out by RLCP on a historically canalised section of the River Lark at Fullers Mill, Suffolk.
© Alan Clarke

How did we do it?

Farm Intervention Work

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

River Restoration Work

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

What's next?

A Suffolk and Norfolk 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 by visiting www.brecks.org/bfer

Recreational pressures in Suffolk

Tourism is vital to Suffolk's economy, significantly contributing to local income and employment. However, alongside local activity, it can also bring substantial recreational pressures, particularly in sensitive areas like the Broads, the Brecks, and coastal sites. In 2023, Suffolk received 37 million visits, generating a total tourism value of £2.13 billion, with day trips comprising the majority at 35.34 million visits and £1.17 billion in value.

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. The influx of boats exacerbates water pollution, increasing nutrient levels and promoting algal blooms that harm aquatic life.

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

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 Suffolk-Norfolk 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.

Strategy Area

Coastal regions

In 2023, Suffolk's coastal regions attracted approximately 4.62 million visits, generating £140 million in spending. However, this sustained popularity exerts significant environmental pressures. High visitor numbers can lead to increased disturbance pressures on important sites for nature, with negative impacts from disturbance, sometimes by dogs off leads, on ground nesting birds or birds feeding at the waters edge of estuaries. Where visitors stray from publicly accessible areas there can be problems of soil compaction, trampling of vegetation and further disturbance. 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.

Boats on the Suffolk Broads boost tourism and the local economy but pose challenges like pollution and habitat disturbance.
©Steve/Adobe Stock

Biological pressures

Invasive non-native species outcompete native wildlife, altering habitats and disrupting ecological balance. In Suffolk, this includes addressing invasive plants (including pests or diseases affecting plants), invertebrates, fish, mammals, the most significant of which are listed below. 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 6. 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

Eight Toothed Spruce Bark Beetle
Ips typographus

Vascular Plant

Acute oak decline
Multiple pathogenic agents

Ash dieback
Hymenoscyphus fraxineus

Vascular Plant

Sooty Bark Disease
Cryptostroma

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

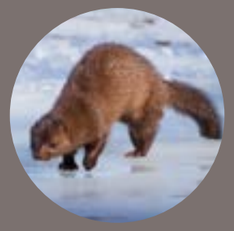
Top mouth gudgeon
Pseudorasbora parva plantarius

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

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 Suffolk 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 7**). 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.

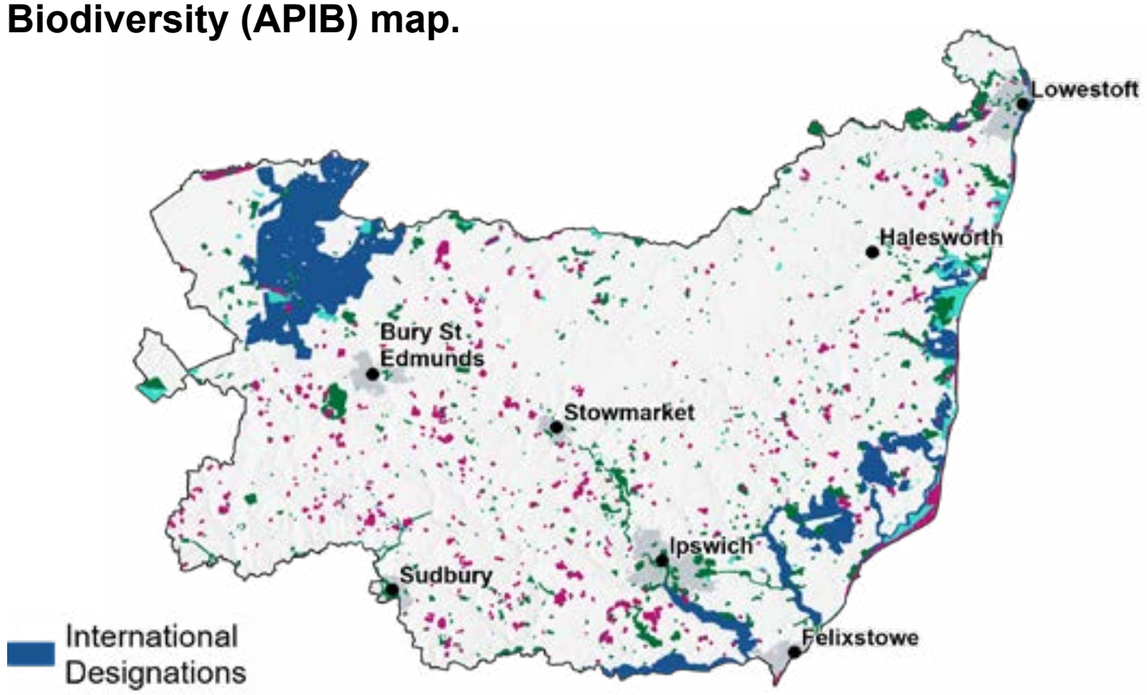
Internationally designated sites

- **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 7. Suffolk's Areas for Particular Importance for Biodiversity (APIB) map.



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

- **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. 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 (referred to as County Wildlife Sites in Norfolk)

- **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. Suffolk's network of CWS is designated through a partnership, chaired by the Suffolk Biodiversity Information Service (SBIS). All local councils in Norfolk have developed policies that offer CWS some protections.

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.

Irreplaceable Habitats in Suffolk 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’.

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Part B: Opportunities Identified

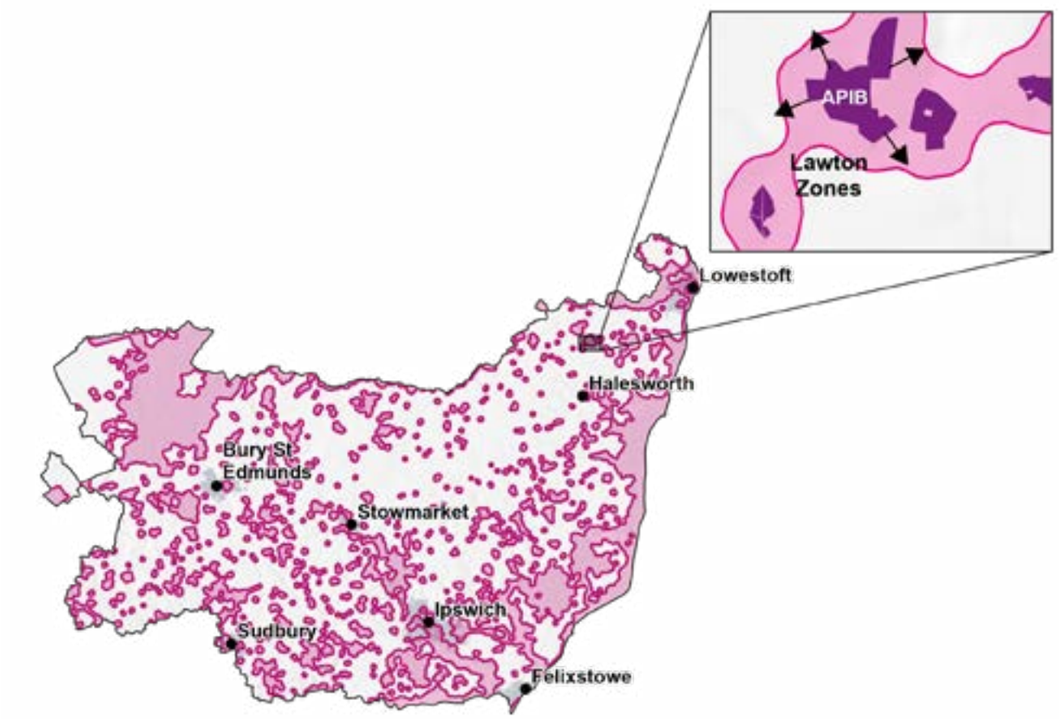
Wildflower field margin and hedgerow showing how agricultural fields can support wildlife and farming together.
© Richard Hadfield/Adobe

Nature recovery principles

The Lawton Principles, introduced in the 2010 report Making Space for Nature, 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 8. Map of biodiversity priorities in Suffolk showing existing APIB habitats (purple) surrounded by a 250 metres buffer or "Lawton Zones" (pink) to expand and connect



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

Opportunities Identified

In Suffolk'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 8**).

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, Suffolk'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 Suffolk's unique landscapes, the strategy provides a clear pathway for nature recovery and long-term environmental sustainability.

The creation of targeted, spatial measures and actions within the priority areas which have been identified and have emerged from the LNRS process 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

Opportunities Identified

- 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

The measures and actions identified for the habitat assemblages and key species in Suffolk's 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

Habitat Opportunities

Opportunities Identified

The following opportunities outline key actions across Suffolk, 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 Suffolk Coast Recreation Disturbance Avoidance and Mitigation Strategy (RAMS) and Wildlife Wise.
- Improve conservation techniques to restore and enhance existing habitats.

Woodland, Trees and Scrub opportunities creating new woodlands and improving existing areas, including wet woodlands, wood pasture and parkland and trees outside of woodlands. This incorporates both planned planning schemes 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.
- Potential links to improving the marine environment.

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.
- Incorporate mosaic features within habitats.
- Remove encroaching habitat where appropriate.

Farmland opportunities

- Connect, expand and enhance areas 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 crossings and buffer areas, drainage systems, green roofs and walls.
- Encourage nature friendly management practices and activities within public spaces, communities and new developments.
- Establish connectivity between gardens and public spaces.
- Incorporate retrofitted features into building work and transport networks.

Wider environmental benefits and co-benefits of nature recovery

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. 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) is shown in **Table 1**.

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 opportuni-ties 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, both increasing in appropriate areas and protection of sensitive habitats using planned re-direction.

Table 1. Co-benefits of nature recovery actions

Service Group	Service	Main Benefits
Provisioning services Outputs from ecosystems that meet human needs.	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.
Regulating services Ecological processes that regulate and reduce pollution and other adverse effects.	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.

Table 1. Co-benefits of nature recovery actions continued

Service Group	Service	Main Benefits
Cultural services Environmental settings that enable cultural interaction and activity	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.
Supporting services Functions provided by ecosystems that underpin other services	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.

The Health, Wellbeing and Access sector across Suffolk and Norfolk 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 Suffolk

- 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.

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.

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 and Woodland, trees and scrub

- Food production; increased yield due to pollinator increase and natural pest predators.
- 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.
- Pollution control and improving water quality from use of buffer strips.
- Increased soil infiltration due to increased organic matter.
- Reduced soil erosion from increased permanent vegetation planting, using cover crops, terracing, agroforestry or adopting conservation tillage techniques.
- 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.

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 high infrastructure sites.
- Noise reduction created by planting schemes.
- Carbon sequestration within 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.

Case Study

The largest wetland creation in a decade

Carlton Marshes

In 2018, having received over £4m from the Heritage Lottery Fund and raised £1 million from public and business donations donations, Suffolk Wildlife Trust set about transforming over 400 acres of land (178ha) to create a southern gateway to the Broads. This was the biggest wetland creation in the Broads for over a decade and saw former farmland transformed into the most accessible nature reserve in East Anglia.

Who is involved?

- Suffolk Wildlife Trust – Grant recipient and project lead.
- Heritage Fund – Principal funder.
- Broads Authority – Key partner.

What have we achieved?

The historic & cultural landscape that defines the Broads National Park as a distinctive and globally important wetland has been restored through the raising of water levels and reintroduction of grazing, to reinstate a functional wetland landscape.

The damage done by intensive arable farming in this part of the Broads National Park has been reversed through the creation and restoration of 155ha of semi-natural habitat (fen meadow, reedbed, wet grazing marsh, marginal upland habitats).

The adjoining European & international designated habitats are less isolated and more resilient in this better connected landscape.

The future of the historic heritage of Oulton Broad has been secured, through the beneficial use of dredgings within the reserve habitat management programme.

Wildfowling adjacent to the designated habitats has stopped.

Within two years Carlton Marshes was the most productive breeding wader site in Suffolk and the reserve supports one of the most diverse dragonfly/damselfly assemblages in the UK.

The visitor centre at Carlton Marshes nature reserve
© Suffolk Wildlife Trust

Ariel view of Petos Marsh
© John Lord

How did we do it?

- On Peto's Marsh we have created 41.6 ha of reedbed habitat and 20 ha of wet grazing marsh from former arable land.
- On the eastern side of Share Marsh, 12.4 ha of wet grazing marsh habitat has been created along with 8.1 ha of fen habitat.
- On the western side of Share Marsh, 27.4 ha of wet grazing marsh habitat has been created and 14.5 ha of fen and reedbed habitat.
- Over 5,300m of dyke habitat has been created and restored.
- 6.8 ha of dry grassland and scrub habitat has been created on former arable land.
- The full ecotone of Broadland habitats, from dry valley side to wetland, identified in the Broads Audit as of principle importance for biodiversity, has been restored.
- Water quality across the whole hydrological unit has been improved through the change in land use from intensive arable farming.

Find out more by visiting www. suffolkwildlifetrust.org/

What can we expect to see?

Within 10 years, the 15km of restored Broadland dykes will support a Special Area of Conservation (SAC) quality assemblage of species within 10 years.

Broadland specialist plant species recorded within 10 years including water soldier, bladderwort & flowering rush.

The Restored fen meadow (29ha) will support a SAC quality assemblage of species within 25 years.

Within 5-10 years the restored wet grazing marsh (54ha) and new reedbed (50ha) will be of similar quality to existing designated habitats.

SSSI units in unfavourable recovering condition (Sprat's Water) will be moved to favourable recovering within 5 years.

Breeding populations of birds which are characteristic of the Broads SSSI will increase in size and range.

Populations of rare and threatened species, identified in the conservation plan, will be larger, more widespread & more resilient to future change.

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

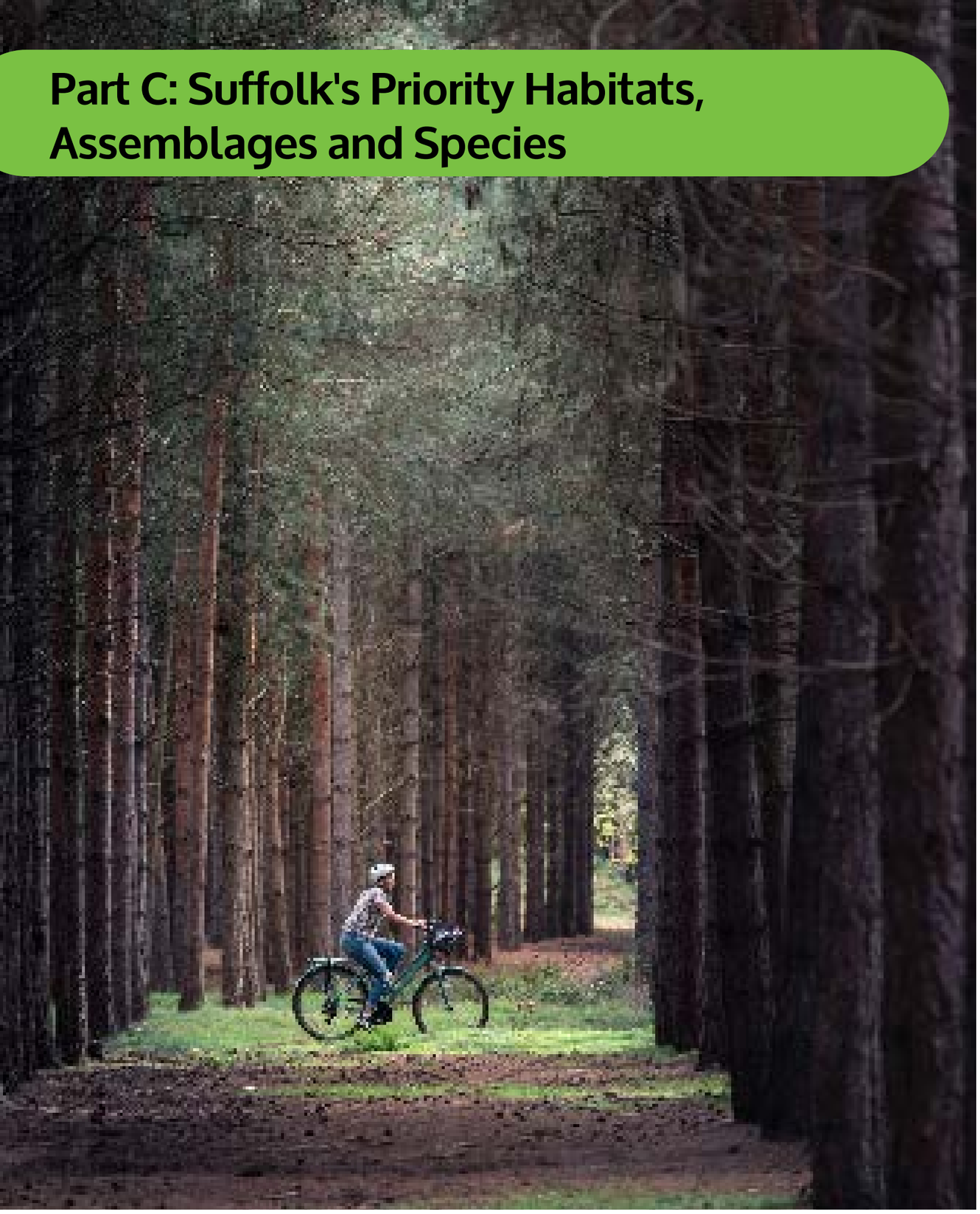


Image: A cyclist enjoys a ride through Rendlesham Forest, highlighting the region's varied habitats and scenic trails
© Gill Moon/National Landscapes

Overview

The LNRS for Suffolk 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 Suffolk, 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 up 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 the 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.

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 robust procedures described, and many species and habitats are expected to be supported by these actions across Suffolk 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 could include a range of advice eg hydrological surveys or reviews of the historic environment.

This review should also consider any consents that may be required, for example from the local planning authority, 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.

People learn about nature recovery at the Suffolk Show
© Jack Cripps/SWT

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 **Appendices 1 and 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.

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 of:

- 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 areas 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 statedalong with a linked code (for supporting information refer to **Part D, Locations for Action**).

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 in 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 rooves, 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 or have no designation existing.

In addition, **Table 2** identifies Wider Priorities designed to apply widely across locations, stakeholders and land parcels, as they 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.

Table 2. Example of priorities and potential measures for habitat areas

Scrub Linked assemblage(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]

Table 3. Potential Measure Evidence Codes

Code	Evidence
HPA01	Anglian River Basin District, Lowestoft Risk Area
HPA02	Anglian Water biodiversity strategy
HPA03	Appropriate biodiversity plans
HPA04	Breckland Biodiversity Audit
HPA05-08	Broads biodiversity focus, strategies and nature recovery plans especially BNRS – Broads Nature Recovery Strategy
HPA09	CABA Chalk Stream Strategy
HPA10	Catchment management plans
HPA11	Catchment partnerships
HPA12	East Marine Plan
HPA13	Estates specific work
HPA14	Farm cluster priority actions plans (location)
HPA15	Internal Drainage Boards plans and priority actions (location)
HPA16	River basin management plans
HPA17	River Catchment Partnerships priority actions
HPA18	RSPB Priority Work Area
HPA19	Suffolk Shoreline Management Plans
HPA20	Suffolk Biodiversity Audit Priority
HPA21	Suffolk local and neighbourhood plans (location)
HPA22	Suffolk local flood risk management SuDS plans (Sustainable Drainage Systems) plans
HPA23	Suffolk Coast RAMS
HPA24	Suffolk Green Strategy
HPA25	Suffolk Wildlife Trust flagship priority
HPA26	Suffolk Wildlife Trust priority habitat
HPA27	Tailored advice and funded interventions (specifics)
HPA28	Tier 1 habitat priority in National Landscape Nature Recovery Plans (location)
HPA29	Tier 2 habitat priority in National Landscape Nature Recovery Plans (location)
HPA30	Tier 3 habitat priority in National Landscape Nature Recovery Plans (location)
HPA31	Tree and Woodland strategies

Mixed Deciduous Woodland

Table 4. Mixed Deciduous Woodland priorities and potential measures

Includes ancient woodland Linked assemblage(s): Native Woodland		
Priority	**Potential Measure(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. [HPA29, Suffolk and Essex Coast & Heaths]	Mapped [PM01]
Enlarge and expand existing deciduous woodland	• Enhance woodland areas within the IDB drainage district through tree planting ensuring potential conflicts with other habitats and species are avoided. • Enlarge areas of ancient semi-natural woodland, including Plantations on Ancient Woodland Sites (PAWS) and secondary woodlands. [HPA15, Broads, Waveney]	Mapped [PM02]
Connect 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. [HPA29, Suffolk and Essex Coast & Heaths]	Mapped [PM03]

Mixed Deciduous Woodland continued

Table 4. Mixed Deciduous Woodland priorities and potential measures continued

Includes ancient woodland Linked assemblage(s): Native Woodland		
Priority	**Potential Measure(s)**	**Map Status**
Restore and enhance existing deciduous woodland	• Reinstate, adapt or introduce appropriate management regimes, such as coppicing. Ensure management plans present 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. • 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 in line with revised management plans. • Restore and enhance ancient semi-natural woodland and restore planted ancient woodland to UKFS standards for biodiversity, climate and other environmental and economic bene-fits by the gradual and systematic removal of conifers, whilst maintaining economic out-puts where possible. • 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. [HPA24, HPA29, Suffolk and Essex Coast & Heaths]	Mapped [PM04]
These measures could offer solutions to address pressures in:		
Woodland, Trees and Scrub; Farmland; Freshwater, Invasive Species and Diseases		

Wet Woodland

Table 5. Wet Woodland priorities and potential measures

Linked assemblage(s): Native Woodland, Rivers and Riverside Habitats		
Priority	**Potential measure(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. [HPA28, Suffolk and Essex Coast & Heaths]	Mapped [PM05]
Enlarge and expand existing wet woodland		Mapped [PM06]
Connect wet woodland areas		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 Establish 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 areas through targeted planting schemes or natural colonisation. • Enhance wet woodlands through active involvement in projects. • 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. [HPA15, (Broads, Waveney), HPA03]	Mapped [PM09]
These measures could offer solutions to address pressures in:		
Woodland, Trees and Scrub; Farmland; Freshwater, Invasive Species and Diseases		

Wood Pasture and Parkland

Table 6. Wood Pasture and Parkland priorities and potential measures

Linked assemblage(s): Trees Outside of Woodlands		
Priority	**Potential measure(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. [HPA30, Dedham Vale]	Mapped [PM09]
Enlarge and expand existing wood pasture		Mapped [PM10]
Connect wood pasture areas		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 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. [HPA30, Dedham Vale]	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. [HPA30, Dedham Vale, HPA13 (Benacre, Sotterley)]	Mapped [PM13]
These measures could offer solutions to address pressures in:		
Woodland, Trees and Scrub; Farmland; Freshwater, Invasive Species and Diseases		

Scrub

Table 7. Scrub priorities and potential measures

Linked assemblage(s): Scrub and Mosaic		
Priority	**Potential measure(s)**	**Map Status**
Create new scrub areas where feasible and desirable	• Include open spaces and transitional habitats, such as scrub, in woodland management plans. [HPA28, Suffolk and Essex Coasts and Heaths, HPA18, HPA26]	Mapped [PM14]
Enlarge and expand existing scrub	• Use scrub areas as connectivity corridors where appropriate. [HPA28, Suffolk and Essex Coasts and Heaths]	Mapped [PM15]
Restore and enhance 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) to improve habitat suitability for dormice. Ensure maintenance and management techniques are employed to retain scrub where appropriate and maintain safety aspects of location. [HPA28, Suffolk and Essex Coasts and Heaths]	Mapped [PM17]
These measures could offer solutions to address pressures in:		
Woodland, Trees and Scrub; Farmland; Grassland and Heathlands; Invasive Species and Diseases		

Table 8. Habitats in Farmed Landscapes priorities and potential measures

Linked assemblage(s): Farmed Landscapes, Trees Outside of Woodlands		
Priority	**Potential Measure**	**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 • 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, HPA14 (Bramfield, Blythburgh, Felixstowe, Sandlings, Stour Valley, Shotley), HPA29, Suffolk and Essex Coasts and Heaths, Dedham Vale]	Mapped where possible when linked to other measures [PM18]
Connect arable field margin areas	• Follow principles identified above to connect existing field margins. [HPA14 (Bramfield, Blythburgh, Felixstowe, Sandlings, Stour Valley, Shotley)]	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. [HPA14 (Bramfield, Blythburgh, Felixstowe, Sandlings, Shotley, Stour Valley), HPA15 (Broads), HPA29, Suffolk and Essex Coasts and Heaths, Dedham Vale]	Mapped where possible when linked to other measures [PM20]
Create new hedgerows using appropriate native species	• Implement regenerative farming practices. • Improve hedgerows and incorporate field-edge trees, encouraging gapping up and planting to enhance connectivity. [HPA14 (Bramfield, Blythburgh, Stour Valley)]	Mapped where possible when linked to other measures [PM21]
Restore and enhance existing hedgerows	• Lay or coppice hedgerows past peak maturity to encourage dense base regrowth and extend their lifecycle. • 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.	Mapped where possible when linked to other measures [PM22]
Establish more hedgerow trees	• Establish species-rich hedgerows. • 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]
These measures could offer solutions to address pressures in:		
Woodland, Trees and Scrub; Farmland; Freshwater; Grassland and Heathlands; Invasive Species and Diseases; Coastal		

Traditional Orchards

Table 9. Traditional Orchards priorities and potential measures

Linked assemblage(s): Trees Outside of Woodlands		
Priority	**Potential measure(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. [HPA14 (Felixstowe, Sandlings, Shotley, Stour Valley)]	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. [HPA14 (Felixstowe, Sandlings, Shotley, Stour Valley), HPA15 (Broads)]	Mapped [PM26]
These measures could offer solutions to address pressures in:		
Woodland, Trees and Scrub; Farmland; Freshwater; Invasive Species and Diseases; Urban and Built		

Habitats in urban, built and garden environments

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

Linked assemblage(s): Urban, Built and Garden Environments		
Priority	**Potential measure(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 [HPA21] 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
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, ensuring the right species is planted in the correct 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 [HPA21]	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

Habitats in urban, built and garden environments continued

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

Linked assemblage(s): Urban, Built and Garden Environments		
Priority	**Potential measure(s)**	**Map Status**
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. • Improve the management of road and rail corridors.	Unmapped
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. • 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 such as green roofs, green walls and high quality varied habitats within public open spaces • Retrofit existing areas with appropriate features	Unmapped
	• Develop high-quality habitats in school grounds to improve biodiversity (linking to Climate Action Plans). • Create habitats through parish-based recovery 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	Unmapped
These measures could offer solutions to address pressures in:		
Woodland, Trees and Scrub; Freshwater; Invasive Species and Diseases; Urban and Built		

Heathland and Acid Grassland

Table 11. Heathland and Acid Grassland priorities and potential measures

Linked assemblage(s): Acid Grassland and Heathland		
Priority	**Potential Measure(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 into appropriate habitat types. [HPA15 (Broads), HPA07]	Mapped [PM27]
Enlarge and expand existing heathland	• Buffer existing heathland sites 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.	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.	Mapped [PM31]
Restore and enhance existing acid grassland	• Promote management and controlled grazing regimes. • Incorporate mosaic features into habitats. • Remove encroaching vegetation where appropriate. Use appropriate management techniques to bring areas into favourable condition	Mapped [PM32]
These measures could offer solutions to address pressures in:		
Grassland and Heathlands; Woodland, Trees and Scrub; Farmland; Freshwater; Invasive Species and Diseases		

Neutral and calcareous grassland

Table 12. Neutral and Calcareous Grassland priorities and potential measures. Includes meadows, arable field margins, road verges, parks, churchyards and cemeteries

Includes meadows, arable field margins, road verges, parks, churchyards and cemetaries Linked assemblage(s): Lowland Meadows and Pastures, Chalk Grassland, Brecks Grass Heath		
Priority	**Potential Measure(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. [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. [HPA14, HPA20]	Mapped [PM37]
Enlarge and expand existing calcareous grassland		Mapped [PM38]
Connect calcareous grassland areas		Mapped [PM39]
Restore and enhance existing calcareous grassland	• Re-establish lowland calcareous grassland from arable or other land. [HPA14, HPA15 (East Suffolk), HPA20]	Mapped [PM40]
Create new lowland meadows and pastures where feasible and desirable	• Incorporate management techniques in appropriate areas to allow natural processes to occur. [HPA14, HPA20]	Mapped [PM41]
Enlarge and expand existing lowland meadows and pastures	• Encourage the use of green hay processes and collection of local seed. [HPA14, HPA20]	Mapped [PM42]
Connect lowland meadow and pasture areas	• Incorporate management techniques in appropriate areas to allow natural processes to occur [HPA14, HPA20] [HPA14, HPA22]	Mapped [PM43]
Restore and enhance existing lowland meadows and pastures		Mapped [PM44]
These measures could offer solutions to address pressures in:		
Grassland and Heathlands; Farmland; Woodland, Trees and Scrub; Invasive Species and Diseases.		

Wet Grassland

Table 13. Wet Grassland priorities and potential measures

Includes grazing marshes and rush pasture Linked assemblage(s): Lowland Meadows and Pastures		
Priority	**Potential Measure(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. [HPA02, HPA05-08, HPA14 (Felixstowe, Sandlings, Shotley, Stour Valley), HPA19, HPA21, HPA26, HPA28, Suffolk and Essex Coasts and Heaths, Dedham Vale)]	Mapped [PM45]
Enlarge and expand existing wet grassland and grazing marshes where feasible and desirable		Mapped [PM46]
Connect wet grassland and grazing marshes areas where feasible		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. [HPA02, HPA14 (Felixstowe, Sandlings, Shotley, Stour Valley), HPA15, HPA19, HPA21, HPA26, HPA28, Suffolk and Essex Coasts and Heaths, Dedham Vale)]	Mapped [PM48]
These measures could offer solutions to address pressures in:		
Grassland and Heathlands; Farmlands; Woodland, Trees and Scrub; Freshwater; Invasive Species and Diseases.		

Open Mosaic Habitat on Previously Developed Land

Table 14. Open Mosaic Habitat on Previously Developed Land priorities and potential measures

Includes brownfield and landfill		
Priority	**Potential Measure(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. [HPA20, HPA21]	Mapped where possible [PM70]
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. [HPA04, HPA20, HPA21]	Unmapped
Improve and enhance existing open mosaic habitat		Unmapped
These measures could offer solutions to address pressures in:		
Grassland and Heathlands; Farmland; Woodland, Trees and Scrub; Urban and Built; Invasive Species and Diseases;		

Rivers and Streams

Table 15. Rivers and Streams priorities and potential measures

Linked assemblage(s): Rivers and Riverside Habitats		
Priority	**Potential Measure(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. [HPA05-08, HPA10, HPA14 (Waveney, Water and Woodlands, Bramfield, Blythburgh), HPA15, HPA17, HPA20 (Breckland, East Suffolk, West Suffolk), HPA29 (Suffolk and Essex Coasts and Heaths, Dedham Vale)	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, HPA15, HPA16, HPA17, HPA29 (Suffolk and Essex Coasts and Heaths, Dedham Vale)]	Mapped [PM50]
Strengthen mosaic of wetland habitats along river channels	• Construction of shallow vegetated water bodies. [HPA15, HPA16, HPA17, HPA20, HPA27 (River Waveney Trust) HPA29 (Suffolk and Essex Coasts and Heaths, Dedham Vale)]	Mapped [PM51]
Improve river, riparian and floodplain habitat	• Reinstate the natural processes of water bodies to impact on morphology and water flow and increase biodiversity. [HPA14, HPA15, HPA16, HPA17, HPA20, HPA27 (River Waveney Trust) HPA29 (Suffolk and Essex Coasts and Heaths, Dedham Vale)]	Mapped [PM52]
Restore and enhance chalk stream habitats	• Restoration of river meanders. • Reconnection of the stream and the flood plain. [HPA09, HPA15, HPA17, HPA21 (Breckland)]	Mapped [PM53]
These measures could offer solutions to address pressures in:		
Freshwater; Farmland; Woodland, Trees and Scrub; Urban and Built; Invasive Species and Diseases;		

Still Water Habitats

Table 16. Still Water Habitats priorities and potential measures

Linked assemblage(s): Still Waters		
Priority	**Potential Measure(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 (Bramfield, Blythburgh, Stour Valley, HPA15, HPA21, HPA26 HPA28 and HPA29, (Suffolk and Essex Coasts and Heaths, Dedham Vale)	Mapped where possible [PM69]
Restore appropriate pond habitats	• Restore ghost or lost ponds and pingos and improve ponds in poor condition. • Retain ponds in the built environment. • Support pond restoration and creation through projects like the Norfolk Ponds Project. [HPA14 (Bramfield, Blythburgh, Stour Valley, HPA15, HPA26 HPA28 and HPA29, (Suffolk and Essex Coasts and Heaths, Dedham Vale)	Mapped [PM54]
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 the majority of 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 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. [HPA04, HPA14 (Bramfield, Blythburgh, Stour Valley, HPA15, HPA21, HPA26 HPA28 and HPA29, (Suffolk and Essex Coasts and Heaths, Dedham Vale), HPA31]	Mapped [PM55]
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. [HPA08, HPA11, HPA14, (Waveney, Water & Woodlands), HPA15]	Mapped [PM56]
These measures could offer solutions to address pressures in:		
Freshwater; Farmland; Woodland, Trees and Scrub; Urban and Built; Invasive Species and Diseases		

Fen Habitats

Table 17. Fen Habitats priorities and potential measures

Linked assemblage(s): Lowland Fen		
Priority	**Potential Measure(s)**	**Map Status**
Create new fen habitats and multi use wetlands	• Create new fen to replace those at risk from climate change impacts, using local seed sources wherever possible. [HPA15, HPA17]	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, HPA14 (Felixstowe, Sandlings), HPA30 (Suffolk and Essex Coasts and Heaths, Dedham Vale)]	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. [HPA02, HPA15, HPA26, HPA30 (Suffolk and Essex Coasts and Heaths, Dedham Vale)]	Mapped [PM59]
These measures could offer solutions to address pressures in:		
Freshwater; Farmland; Woodland, Trees and Scrub; Invasive Species and Diseases		

Reedbeds

Table 18. Reedbeds priorities and potential measures

Linked assemblage(s): Reedbeds and Freshwater Wetlands		
Prioritiy	**Potential Measure(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. [HPA02, HPA06, HPA15, HPA18, HPA28 (Suffolk and Essex Coasts and Heaths)]	Mapped [PM60]
Enlarge, expand and connect existing reedbed habitat	• Incorporate SuDS, including reedbeds and natural 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, maintaining and extending reedbed fringe habitats along Board drains where feasible. [HPA02, HPA06, HPA14 (Felixstowe, Sandlings), HPA15, HPA18]	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. [HPA02, HPA06, HPA15, HPA18]	Mapped [PM62]
These measures could offer solutions to address pressures in:		
Freshwater; Coastal; Farmland; Woodland, Trees and Scrub; Invasive Species and Diseases;		

Coastal Saltmarsh and Intertidal Mudflats

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

Linked assemblage(s): Saltmarshes and Lagoons		
Priority	**Potential Measure(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 (e.g., removing or breaching artificial structures). • Convert grazing marsh areas to saltmarsh where appropriate. • Actively convert grazing marsh areas at high risk of sea defence failure to saltmarsh. [HPA12, HPA14 (Felixstowe, Sandlings, Shotley), HPA15, HPA18, HPA28 (Suffolk and Essex Coasts and Heaths)]	Mapped [PM63]
Enlarge and expand existing saltmarsh		Mapped [PM64]
Restore and enhance existing saltmarsh	• Allow saltmarsh to develop naturally and migrate inland where feasible, restoring the coastal floodplain through managed realignment (e.g., removing or breaching artificial structures). • Improve saltmarsh management in areas outside SAC, SSSI, and Ramsar designations. • Mitigate impacts from recreational disturbance, linking to strategic solutions where appropriate. HPA12, HPA14 (Felixstowe, Sandlings, Shotley), HPA15 (East Suffolk), HPA18, HPA23, HPA28 (Suffolk and Essex Coasts and Heaths)]	Mapped [PM65]
Create new intertidal mudflats where feasible and desirable	• Implement shoreline management strategies, including managed realignment. HPA12, HPA14 (Shotley), HPA15 (East Suffolk), HPA18, HPA23, HPA28 (Suffolk and Essex Coasts and Heaths)]	Mapped [PM66]
Enlarge and expand existing intertidal mudflats		Mapped [PM67]
Restore and enhance existing intertidal mudflats		Mapped [PM68]
These measures could offer solutions to address pressures in:		
Freshwater; Coastal; Farmland; Invasive Species and Diseases;		

Coastal Sand Dunes

Table 20. Coastal Sand Dunes priorities and potential measures

Linked assemblage(s): Coastal Shingle and Dunes		
Priority	**Potential Measure(s)**	**Map Status**
Facilitate the formation of new coastal sand dunes	• Allow natural coastal processes to enable dunes to develop, move, and function naturally. • Implement shoreline management, including managed realignment. [HPA15 (Broads, East Suffolk)] HPA19]	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 ecotones with inland habitats.	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). • 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. [HPA19, HPA23]	Unmapped
These measures could offer solutions to address pressures in:		
Coastal; Freshwater; Invasive Species and Diseases		

Coastal Vegetated Shingle

Table 21. Coastal Vegetated Shingle priorities and potential measures

Linked assemblage(s): Coastal Shingle and Dunes		
Priority	**Potential Measure(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 (East Suffolk), HPA19, HPA28 (Suffolk and Essex Coasts and Heaths)]	Unmapped
Enlarge and expand existing coastal vegetated shingle	• Allow natural coastal processes to enable vegetated shingle to develop, move, and function naturally. • Implement shoreline management, including managed realignment. [HPA15 (East Suffolk), HPA19, HPA28 (Suffolk and Essex Coasts and Heaths)]	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 (e.g., SAC, SSSI, Ramsar). • Mitigate recreational disturbance impacts through strategic solutions. • Implement shoreline management, including managed realignment. [HPA15 (East Suffolk), HPA19, HPA23, HPA28 (Suffolk and Essex Coasts and Heaths)]	Unmapped
These measures could offer solutions to address pressures in:		
Coastal; Freshwater; Invasive Species and Diseases;		

Maritime Cliffs and Slopes

Table 22. Maritime Cliffs and Slopes priorities and potential measures

Priority	Potential Measure(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 (East Suffolk, HPA19]	Unmapped
Enlarge and expand existing maritime cliffs and slopes		Unmapped
Restore and enhance existing maritime cliffs and slopes		Unmapped
These measures could offer solutions to address pressures in:		
Coastal; Invasive Species and Diseases		

Saline Lagoons

Table 23. Saline Lagoons priorities and potential measures

Linked assemblage(s): Saltmarshes and Lagoons		
Priority	**Potential Measure(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 (East Suffolk, HPA19, HPA28, (Suffolk and Essex Coasts and Heaths)]	Unmapped
Connect saline lagoon areas		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. • Implement shoreline management, including managed realignment. [HPA15 (East Suffolk, HPA19, HPA28, (Suffolk and Essex Coasts and Heaths)]	Unmapped
These measures could offer solutions to address pressures in:		
Coastal; Invasive Species and Diseases		

Table 24. Wider Priorities

Nature Recovery Priority: General priorities to enhance a wide range of habitats and processes across the region (not spatially targeted to particular locations)	
Priority	**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.
Reduce air pollution pressures on nature from all sources	• Promote reduced emissions of damaging air pollutants from all sources.
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.
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 water use pressures on nature from all sources	• Promote reduced water use from all sources. • Restore sustainable water abstraction across catchments.
Reduce recreational pressures on nature from all sources	• Promote responsible recreational practices (with links to strategic solutions mitigating impacts on sensitive sites like Suffolk Coast RAMS). • 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.
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.
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	

A pair of Kingfishers on a branch
© The Wildlife Trusts

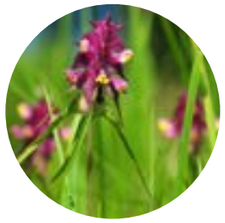
Prioritising species

The foundation of this work began with a thorough review of 1284 species of concern across Suffolk, 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 261 species, which were further refined to 23 key species for focused action, while the remaining were grouped into habitat-based assemblages. All species are listed in **Tables 67-69** and full details are available in **Appendix 3.** The key species are shown below in **Figure 9**.

Figure 9. Key species

Basil-thyme case-bearer
Coleophora tricolor

Bark-sulpher firedot
Caloplaca flavorubescens



Crested cow-wheat
Melampyrum cristatum

Dwarf eelgrass
Zostera noltei

Eurasian curlew
Numenius aquata

European eel
Anguilla anguilla

Fen raft spider
Dolomedes plantarius

Hazel dormouse
Najas marina

Intermediate stonewort
Chara intermedia

Kittiwake
Rissa tridactyla

Lapwing
Vanellus vanellus

Little whirlpool ramshorn snail
Anisus vorticulus

Narrow-mouthed whorl snail
Vertigo angustior

Natterjack toad
Epidalea calamita

Orange-fruited elm lichen
Caloplaca luteoalba

Rosser's sac-spider
Clubiona rosserae

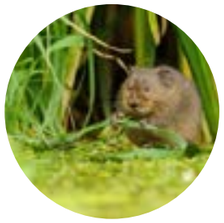
Scarce vapourer
Orgyia recens

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

Images on page 111: Basil-thyme case-bearer © Rob Dyke; Bark sulpher firedot © Tomás Curtis; Crested cow-wheat © Neil Pike/Natural England; Dwarf eelgrass © UK Wild Flowers; Eurasian curlew © Sandra Standbridge/Adobe Stock; European eel © Jack Perks/NWT; Fen raft spider © Ron McIntyre; Hazel doormouse © katpaws/ Adobe Stock; Kittwake © Erni/ Adobe Stock; Intermediate stonewort © D. Auderset Joye; Lapwing © fotogenix/Adobe Stock; Little whirlpool ramshorn snail © Alex Hyde/Back from the Brink/Flickr. Images above: Narrow-mouthed whorl snail © Roy Anderson/Buglife; Natterjack toad © Philip Precey; Orange-fruited elm lichen © Ray Woods/ The British Lichen Society; Rosser's sac-spider © Peter Harvey, Scarce vapourer © Neil Sherman; Serotine bat © Sergey Ryzhkov/Adobe Stock; Starlet sea anemone © Robert Aguilar; Starry Breck lichen © Annie Evankow/iNaturalist; Suffolk lungwort © Wild Flower Web; Water vole © NWT; White-clawed crayfish © Linda Pitkin/2020VISION

Habitat-based assemblages

Beyond individual species, the Suffolk 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 25-39)**. 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. 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.

Coastal Shingle and Dunes

Saltmarshes and Lowland Meadows and Pastures

Reedbeds and Freshwater Wetlands

Farmland Landscapes

Native Woodland

Trees Outside of Woodland

Scrub and Mosaic

Still Waters

Rivers and Riverside Habitats

Lowland Fen

Chalk Grassland

Breckland Grass Heath

Acid Grassland and Heathland

Urban, Built and Garden Environments

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.

Table 25. Coastal Shingle and Dunes assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
Little tern *Sternula albifrons* 	Implement intensive protective management for major colonies and provide suitable habitat areas.
Shortlisted species (showing recovery potential)	
Arctic tern	As above.
Gnaphosa lugubris spider	Habitat improvement and protection, alongside appropriate ecological research and monitoring to better understand detailed species requirements.
Grey hair grass	Conduct rotavation and grazing of dunes to mobilise sand and manage recreational pressures.
Rhysodromus fallax spider	Where possible, reduce recreational pressures by incorporating accessible areas within appropriate habitats
Prickly saltwort	
Baryphyma maritimum spider	
Clubiona frisia 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.
String of sausages lichen	Where possible, reduce recreational pressures by incorporating accessible areas within appropriate habitats. on dunes to protect sensitive areas
Yellow vetch	Manage scrub edges within habitats to maintain ecological balance.
Additional species or groups benefiting from conservation actions	
Other lichens and fungi	
These measures could offer solutions to address pressures in:	
Coastal; Freshwater; Invasive Species and Diseases;	

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.

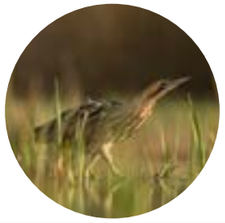
Table 26. Saltmarshes and lagoons assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
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.
Shortlisted species (showing recovery potential)	
Oystercatcher	Enhance 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.
Small cord-grass	
Sea heath	
Divided sedge	
Borrers saltmarsh-grass	
Pedunculate sea-purslane	Establish new populations as backups to the existing site in Essex; restore upper saltmarsh habitats in suitable Suffolk coastal and estuarine sites, restore the saltmarsh/dune interface where appropriate and translocate specimens as needed.
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	
Praestigia duffeyi spider	Maintaining and restoring saltmarsh, including management of appropriate water levels and levels of grazing
Additional species or groups benefiting from conservation actions	
Bryophytes; Dark-bellied brent goose	
These measures could offer solutions to address pressures in:	
Coastal; Freshwater; Invasive Species and Diseases;	

Reedbeds and Freshwater Wetlands

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

Table 27. Reedbeds and freshwater wetlands assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
Bittern *Botaurus stellaris* 	• Create large contiguous reedbed expanses (over 1 hectare) with restoration and protection of flooded channels. • Lower any reedbeds 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 willow.
Shortlisted species (showing recovery potential)	
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.
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.
Desmoulin's whorl snail	Use ditch management and vegetation control, alongside maintenance of hydrological conditions.
Hen harrier	Create and manage winter habitats by preventing disturbance, monitoring illegal persecution and disease; link to agri-environment schemes.
Erioptera bivittata fly	Improve and protect habitats with ecological research and monitoring to enhance understanding of specific species requirements
Erioptera meijerei fly	
Fenn's wainscot	Regularly cut reedbeds as part of habitat management.
Grass-poly	Use 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 in appropriate areas to support species needs.
Water Dock Case Bearer	Employ ditch management techniques and vegetation control to create specific habitat of food plant
Additional species or groups benefiting from conservation actions	
Other bat species; Aquatic macrophytes; Aquatic beetles	
These measures could offer solutions to address pressures in:	
Coastal; Farmland; Freshwater; Invasive Species and Diseases;	

Farmed Landscapes

Suffolk'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.

Table 28. Farmed landscapes assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
Turtle dove *Streptopelia turtur* 	• Maintain diverse, high-quality habitats, including grassland, cropland (weedy margins, fallows, and stubbles), woodland, wet grassland, wetland, scrub, heathland, hedgerows, and coastal areas as needed. • Maintain a mix of high-quality woodland, woodland edges, and dense hedgerows near bare ground with access to weed seeds. • Provide scrub trees for nesting, freshwater sources (ponds and streams), and small seeds for food. Create suitable habitats by setting aside uncropped margins, planting buffer strips around arable fields, and sowing wild bird seed mixes or scattered seed sources. • Restore or create semi-natural grasslands • Manage hedges to offer nesting sites while allowing scrub areas to regenerate. • 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.
Shortlisted species (showing recovery potential)	
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.
Grey partridge	
Yellow wagtail	
Cuckoo	
Skylark	
Tree sparrow	
Linnet	
Greenfinch	
Bullfinch	
Corn bunting	
Yellowhammer	
Barberry carpet	Plant barberry within hedgerows to enhance habitat diversity.
Brown hairstreak	Prominence of blackthorn and infrequent cutting regime.
Ground pine	• Ensure appropriate management of arable field margins, habitat improvement, and protection. • Conduct ecological research and monitoring to better understand the specific requirements of species.
Slender tare	
Wild pansy	
Broad fruit corn-salad	
Small flowered catchfly	
Red Tipped Cudweed	
Additional species or groups benefiting from conservation actions	
Hedgerow butterflies; Hedgerow trees eg Hazel, Hawthorn; Pink-footed goose	
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;	

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.

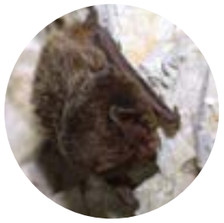
Table 29. Lowland Meadows and Pastures assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
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. • 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. • Reestablish specimen plants on appropriate lost sites.
Shortlisted species (showing recovery potential)	
Dingy skipper	As above, incorporating appropriate management and trials for species re-establishment as needed. Appropriate hay management and/or grazing
Spiny restharrow	
Twayblade	
Deptford pink	
Sulphur clover	
Frog orchid	
Chamomile	
Additional species or groups benefiting from conservation actions	
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.
Barn owl; Bryophytes	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Freshwater; Grassland and Heathlands; Invasive Species and Diseases;	

Native Woodland

Suffolk'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.

Table 30. Native Woodland assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
Barbastelle bat *Barbastella barbastellus* 	• Use woodland management practices to enhance appropriate 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.
Shortlisted species (showing recovery potential)	
Eagle's claw lichen *Wadeana minuta* lichen	• Maintain host tree species (eg Acer, Fraxinus, Ulmus, Quercus) in wood pasture, parkland, and along roadsides. • Thin trees selectively to reduce overstocking 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.
Drab wood soldierfly Lesser spotted woodpecker Willow tit Oak polypore Marsh tit Redpoll Hawfinch Dark crimson underwing Greater butterfly-orchid Spotted flycatcher	• 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. • Control deer populations to preserve understorey vegetation. • Restore woodland connectivity to support ecosystem health and species movement. • Use rotational cutting of the understorey to encourage regrowth and structural diversity.

Native Woodland continued

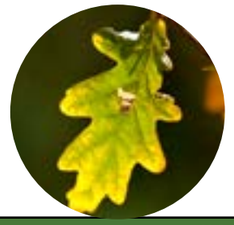
Table 30. Native Woodland assemblage key species and potential measures continued

Species	Potential Measures
Shortlisted species (showing recovery potential)	
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.
White admiral	
Wild service tree	Identify and include key species within planting strategies to support biodiversity and habitat goals.
Small leaved lime	
Additional species or groups benefiting from conservation actions	
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.
Other bat species; Bryophytes; Other native tree species eg Alder, Oak; Sapproxilic beetles	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Freshwater; Urban and Built; Invasive Species and Diseases;	

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.

Table 31. Trees Outside of Woodland assemblage key species and potential

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
Pedunculate oak *Quercus robur* 	Use for planting programmes in appropriate soils and within appropriate locations (use Ecological Site Classification (ESC) profiles)
Shortlisted species (showing recovery potential)	
Field maple	Use for planting programmes using species appropriate to soil type, climate and location (use Ecological Site Classification (ESC) profiles)
Sweet chestnut	
Rowan	
Yew	
Hornbeam	
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.
White letter hairstreak	
Golden hoverfly	Maintain veteran specimens to support associated species.
Beech	
Additional species or groups benefiting from conservation actions	
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 or plant trees near existing sites to boost species populations. • Control deer populations to sustainable levels,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.
Other veteran trees; Bryophytes	
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;	

Scrub and Mosaic

Mixed vegetation in scrub, open mosaics, and transitional areas creates dynamic habitats for diverse species, linking woodlands and open landscapes to enhance biodiversity and ecological resilience.

Table 32. Scrub and Mosaic assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
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.
Shortlisted species (showing recovery potential)	
Red-backed shrike Adder	• 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.
Additional species or groups benefiting from conservation actions	
Other lichens and fungi; Bryophytes	
These measures could offer solutions to address pressures in:	
armland; Woodland, Trees and Scrub; Freshwater; Urban and Built; Invasive Species and Diseases;	

Still Waters

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

Table 33. Still Waters assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
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.
Shortlisted species (showing recovery potential)	
Common toad	Create nearby high-quality terrestrial habitat
Ribbon leaved water plantain Opposite-leaved pondweed	Conduct habitat disturbance (deweeding and desilting) and restore site hydrology.
Zircon reed beetle	Ensure marginal sedges are present as needed.
Stoneworts	Keep water clean and maintain mineral substrates.
Bewick's swan Whooper swan	Implement land management practices to ensure nearby safe feeding areas on farmland are available.
Frogbit Water-violet	Maintain or improve marsh ditches and pools to create slow-moving, calcareous conditions.
Additional species or groups benefiting from conservation actions	
Water beetles; Aquatic macrophytes	
These measures could offer solutions to address pressures in:	
Farmland; Freshwater; Urban and Built; Invasive Species and Diseases;	

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.

Table 34. Rivers and Riverside Habitats assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
Kingfisher *Alcedo atthis* 	Improve water quality and create wetland habitat and riparian tree planting.
Shortlisted species (showing recovery potential)	
Spined loach	Employ suitable substrate and vegetation management regime.
Brook lamprey	
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	Follow IUCN guidelines for reintroductions into fenced enclosures, accompanied by long-term monitoring and a management plan. 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.
Devil's bit scabious	Maintenance of riverside habitats to prevent shading and promote growth.
Additional species or groups benefiting from conservation actions	
Grazing molluscs; Aquatic macrophytes; Otters; Water shrews	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Freshwater; Urban and Built; Invasive Species and Diseases;	

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.

Table 35. Lowland Fen assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
Fen orchid *Liparis loeselii* 	Restore and create calcareous fens and wet meadows to promote connectivity, incorporating management techniques like disturbance and grazing. Reduce numbers and the pressure of deer in fens using sustainable techniques
Shortlisted species (showing recovery potential)	
Marsh fragrant-orchid	As above.
Early marsh orchid (cream flowered form)	
Greater water parsnip	Translocation of appropriate specimens to prepared areas of habitat incorporating implications of threats of disease
Milk parsley	
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	
Pashford pot beetle	Lowland Fen general habitat creation and restoration.
Neon valentulus	Maintain sedge beds by leaving litter in place and managing water levels to support spider habitats.
Hygrolycosa rubrofasciata	For fen and fen carr, maintain water table levels and apply "re-wetting" techniques to enhance spider habitats.
Gongylidiellum murcidum	
Swollen spire snail	Implement appropriate cutting regimes to encourage Reed sweetgrass (Glyceria maxima) dominance over Phragmites.
Fen mason-wasp	Create and enhance general habitats, ensuring areas of bare ground are included.
Large marsh grasshopper	Restore and connect fragmented habitats to support species movement.
Additional species or groups benefiting from conservation actions	
Fungi; Orchids	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Freshwater; Grassland and Heathlands; Invasive Species and Diseases;	

Chalk Grassland

Suffolk'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.

Table 36. Chalk Grassland assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
Chalkhill blue *Lysandra coridon* 	Improve and create chalk grassland to support populations of Horseshoe vetch.
Shortlisted species (showing recovery potential)	
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 Spotted cat's-ear	• Enhance and protect habitats with ecological research and monitoring to better understand species requirements. • Use improved grazing techniques with traditional breeds, controlled hay-cutting, and scrub clearance.
Military orchid	Improve management of road verges, escarpment, old chalk pits, limestone quarries, scrub edge and dune slacks on suitable soils.
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.
Yellow vetching	Improve management of road verges, waysides, waste ground, railway embankments, docks, sheltered undercliffs on suitable soils.
Additional species or groups benefiting from conservation actions	
Rock rose, horseshoe vetch; Grassland bee species; Grassland butterfly species; Crickets/ grasshoppers; Other bat species	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Grassland and Heathlands; Invasive Species and Diseases;	

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.

Table 37. Brecks Grass Heath assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
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.
Shortlisted species (showing recovery potential)	
Woodlark	In Brecks and forest clearings, restore and maintain a network of open spaces within forestry plantations and connect lowland heaths.
Fingered speedwell Grey carpet Interrupted brome	Maintain appropriate arable margins using low-input methods and introduce species where necessary.
Spring speedwell Prostrate perennial knawel Bur medick Seaside pansy	Use livestock and rabbit grazing to create habitats and disturb soil with low-input arable methods to establish appropriate arable margins.
Sand catchfly Sandwich click beetle	Employ favourable grazing regimes and use low-input methods to disturb soil, creating suitable arable margins.
Lycoperdina succincta beetle *Verrucaria xyloxena* lichen Sheet-weaver spider (Agyneta fuscipalpa)	Recreate connected habitats by applying grazing techniques and removing invasive species.
Field wormwood/The Brecks mugwort Proliferous pink Wormwood moonshiner	In Brecks and open mosaics, maintain open grassland on sandy soil, control grazing regimes, remove invasive species, and increase the population of field wormwood.
Additional species or groups benefiting from conservation actions	
Spring sedge; Other lichens and fungi	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Freshwater; Grassland and Heathlands; Invasive Species and Diseases;	

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 Suffolk's landscapes.

Table 38. Acid Grassland and Heathland assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
Nightjar *Caprimulgus Europaeus* 	Implement effective rotational forestry management, including the management, protection, restoration, and re-creation of key habitats such as heathland and rotational forestry.
Shortlisted species (showing recovery potential)	
Heath dog-violet	Employ effective habitat control and restoration to create hydrological profile required.
Dolichopus migrans fly	Open up habitats through management practices like grazing.
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	
Bell heather	Apply appropriate management techniques, such as grazing, cutting, and habitat restoration, to increase the overall area of habitat.
Additional species or groups benefiting from conservation actions	
Heathland bee species; Heathland butterfly species	
These measures could offer solutions to address pressures in:	
Farmland; Freshwater; Grassland and Heathlands; Invasive Species and Diseases;	

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.

Table 39. Urban, Built and Garden Environment assemblage key species and potential measures

Species	Potential Measures
Iconic flagship species (indicating habitat health)	
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. • Encourage wildlife gardening for food, roosting, and nesting spaces. • Install nest boxes, use building eaves, and preserve nesting sites, including on new build homes and via retro-fitting initiatives. • 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.
Shortlisted species (showing recovery potential)	
Starling	As above.
House martin	
House sparrow	
Swift	
Swallow	
Greenfinch	
Barberry Carpet	
Additional species or groups benefiting from conservation actions	
Bee and pollinator species; Urban trees; Other bat species	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Freshwater; Urban and Built; Invasive Species and Diseases;	

Case Study

Bolstering rare species

Suffolk native Black Poplar project

Because of land and timber use changes over the past two centuries, Black Poplars now very rarely naturally regenerate and the species is dependent on human intervention for its survival. There are presently only approximately 150 known clones in the UK, placing it at serious risk from pests and diseases.

The Suffolk Native Black Poplar ('NBP') Project aims to:

- assist in the development and diversification of the existing Dedham Vale NL and Nowton Park NBP clone banks
- propagate new male and female saplings from cuttings from clone trees
- distribute those saplings county-wide for wetland/riparian planting projects
- update the existing Suffolk Biodiversity Information Service (SBIS) database by (re-)surveying known mature trees and recording newly-discovered and newly-planted trees.

Who is involved?

The lead organisation for the project is the Suffolk Tree Warden Network ('STWN'), which coordinates the clone bank development work, the nursery work for the production of saplings, the distribution of saplings to planting projects, the recording of all new saplings on the SBIS database, and the (re-) surveying of known mature trees.

Key project partners are Dedham Vale NL, West Suffolk Council at Nowton Park, and SBIS, for implementation of project elements. Apart from past partial SCC funding, the project has yet to secure any key funders.

What have they achieved?

The project has, in the 3 years since initiation, grown and distributed over 800 saplings to planting projects across Suffolk.

Project volunteers have also (re-) surveyed more than 30 trees and implemented selected DNA testing via Forest Research to improve the SBIS database.

A black poplar nursery facility has been established at Nowton Park nursery, where volunteers assist in propagation and maintenance. Upgrading and diversification of the clone banks is in hand, both of which involve significant volunteer engagement.

The Suffolk project has been instrumental in setting up the East Anglian Black Poplar Project; in leading in the establishment of a national Black Poplar project; and in supporting via the provision of genetic material samples the European Black Poplar genome project which will improve understanding of the genetic history and variability of current European (including British) Black Poplar populations.

The Black Poplar at Butley, Suffolk
© David Appleton

How did we do it?

Central to the widespread species reintroduction in wetland/riparian habitats has been our engagement strategy.

We have reached out to private landowners (many through STWN's own marketing presence at public events and through volunteer Tree Warden community engagement), farm clusters, SWT reserves, the National Trust, the EA, the Little Ouse Headwater Project, the River Waveney Trust and other environmental groups.

What's next?

The long-term project aims are to:

- diversify the existing Suffolk clone banks with new clones introduced from across the UK
- establish a permanent dedicated nursery
- identify new clones from continued surveying and DNA testing
- support breeding of new clones by partner organisations (such as Kew).

These aims will require funding to cover costs, and the ongoing support of STWN, Dedham Vale NL, West Suffolk Council at Nowton Park, and SBIS.

Find out more by visiting www.suffolktreewardens.org.uk/community-tree-nursery

Case Study

Protecting breeding waders

Trimley Marshes breeding wader project

Wader birds including avocets, redshanks and lapwings nest on the ground and are very vulnerable to non-flying predators such as foxes and badgers.

This project involved the installation of 1.2km of permanent in-dyke fencing at Trimley Marshes to protect the eggs, chicks and breeding waders. The new fencing provided a solution to a problem posed by a temporary 9-line electric fence which only provided very limited protection to the wildlife rich lagoons.

Who is involved?

Suffolk Wildlife Trust own and manage the Trimley Marshes Nature Reserve. The Suffolk & Essex Coast & Heaths National Landscape (SECHNL) secured £29,256 from the Farming In Protected Landscapes (FiPL) fund to pay for the work.

What have we achieved?

1.2km of permanent in-dyke fencing was successfully installed. A suite of habitat creation and restoration work was also successfully carried out:

- 1km of new foot drain habitat was created and restored.
- 2km of dyke habitat was restored.
- 2 outlets were restored.
- 2 breeding wader islands were created.
- 1 breeding wader island was reprofiled.

This will significantly help to provide breeding and feeding opportunities for key target wader species such as redshank, lapwing and avocet. It will also help wintering waterfowl such as wigeon and teal.

The restored habitat will also help tackle climate change through carbon sequestration and storage.

Wetland creation at Trimley Marshes © Alex Moore da Luz

Case Study

Wetland creation, Trimley Marshes © Alex Moore da Luz

How did we do it?

The new 1.2km fence is made of high-tensile netting installed on a Versalok post system with metal strainers, turners, and intermediate posts. The straining posts are box-type, with intermediate posts measuring 2.7m and strainers and turners at 3.3m.

The fence was built at the base of the slope, partially in the water, with slight angle turns to keep it in shallow areas of the dyke for easier installation.

A vibrating head on a 5-tonne tracked excavator drove the posts, and the netting was positioned at a height to ensure a stock-proof barrier.

What's next?

Regular bird surveys will be conducted by reserve staff and volunteers to monitor any changes in breeding and wintering bird numbers.

The site is also being used as a demonstration site to show other landowners and nature reserve managers the benefits of anti-predator fencing and habitat creation work.

Find out more by visiting www. coastandheaths-nl.org.uk/managing/farming-in-protected-landscapes/projects-approved/trimley-marshes-breeding-wader-project

Key species

The LNRS prioritisation process identified 23 key species representing Suffolk'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 Suffolk's natural heritage.

Each of these species is profiled in this section **(Table 40-62)**, detailing their primary conservation measures, suitable habitats, and the broader biodiversity benefits of their protection.

A family visiting SWT Carlton Marshes nature reserve near Lowestoft

© John Ferguson/SWT

Basil-thyme case-bearer

Coleophora tricolor

Table 40. Basil-thyme case-bearer measures

Suitable Habitats	
	Basil-thyme 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.
Primary Measure	
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).
Other Relevant Measures	
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.
Other Linked Assemblage Benefits	
Brecks Grass Heath; Acid Grassland and Heathland	
These measures could offer solutions to address pressures in:	
Farmland; Grassland and Heathlands	

Bark-sulpher firedot

Caloplaca flavorubescens

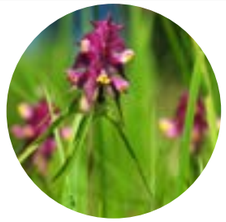
Table 41. Bark-sulpher firedot measures

Suitable Habitats	
	On Fraxinus wayside and parkland trees, particularly in limestone areas, and Populus tremula scarce on wood (Smith et al., 2009).
Primary Measure	
Habitat Restoration/ enhancemen	• Manage existing mature trees to providethe next generation of veterans - e.g. Sycamore, Norway Maple, Sallows, Hazel, Aspen and Field Maple (as appropriate to the location). Alternatively, plant suitable host tree species and encourage the planting / replacement of pasture and wayside trees to ensure continuity of suitable habitat Planting regimes should follow ESC profiles.
Other Relevant Measures	
Species-specific action	• Mitigate ash-dieback impact. Ensure veteran ash trees are not felled even if infected (evidence suggests that old ash trees die more slowly) and provide ongoing sympathetic management for any infected hosts
Land management advice and techniques	• Ensure existing/potential host trees are kept free of scrub and ivy.
Pollution reduction & mitigation	• Ensure wayside trees are kept free of fertilisers, manure and slurry through the implementation of agri-environment schemes.
Other Linked Assemblage Benefits	
Trees Outside of Woodland; Native Woodland; Farmed Landscapes	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Invasive Species and Diseases	

Crested cow-wheat

Melampyrum cristatum

Table 42. Crested cow-wheat measures

Suitable Habitats	
	Margins, rides, and glades within ancient oak woodland, as well as associated field hedgebanks and roadsides.
Primary Measure	
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 arable margins near populations.
Other Relevant Measures	
Habitat Creation, Expansion, and Connectivity	• Expand woodlands to reconnect fragmented sites and increase suitable habitat.
Other Linked Assemblage Benefits	
Native Woodland; Trees Outside of Woodland; Farmed Landscapes	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub	

Dwarf eelgrass

Zostera noltei

Table 43. Dwarf eelgrass measures

Suitable Habitats	
	Typically found in shallow marine environments on intertidal mudflats. These habitats are characterised by brackish or fully saline waters, often in sheltered coastal locations.
Primary Measure	
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.
Other Relevant Measures	
Sustainable Farming Practices	• Manage grazing, mowing, fertiliser, pesticide, and slurry use. • Implement buffer zones and improve planning 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
Other Linked Assemblage Benefits	
Saltmarshes and Lagoons	
These measures could offer solutions to address pressures in:	
Coastal	

Eurasian curlew

Numenius aquata

Table 44. Eurasian curlew measures

Suitable Habitats	
	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.
Primary Measure	
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.
Other Relevant Measures	
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.
Other Linked Assemblage Benefits	
Reedbeds and Freshwater Wetlands; Lowland Meadows and Pasture; Farmed Landscapes	
These measures could offer solutions to address pressures in:	
Coastal; Farmland; Freshwater; Grassland and Heathlands; Invasive Species and Diseases;	

European eel

Anguilla *anguilla*

Table 45. European eel measures

Suitable Habitats	
	The species 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.
Primary Measure	
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.
Other Relevant Measures	
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 (e.g., re-meandering) are beneficial. In lakes, focus on reinstating marginal woody debris and bankside vegetation.
Other Linked Assemblage Benefits	
Rivers and Riverside Habitats; Saltmarshes and Lagoons	
These measures could offer solutions to address pressures in:	
Freshwater; Invasive Species and Diseases;	

Fen raft spider

Dolomedes plantarius

Table 46. Fen raft spider measures

Suitable Habitats	
	Relies 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.)
Primary Measure	
Population Establishment	• Continue establishing new populations and implement translocation to suitable sites.
Other Relevant Measures	
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.
Other Linked Assemblage Benefits	
Still Waters; Reedbeds and Freshwater Wetlands; Lowland Fen	
These measures could offer solutions to address pressures in:	
Farmland; Freshwater;	

Hazel dormouse

Muscardinus avellanarius

Table 47. Hazel dormouse measures

Suitable Habitats	
	New growth woodland is the preferred habitat. Preference for coppice woodland, or woodland managed through ride widening or thinning. Can also be found in scrub and hedgerows. Deciduous woodland with well-developed shrub layer, overgrown hedgerows, scrub and plantations where the shrub layer is suitable.
Primary Measure	
Habitat Restoration and Enhancement: Connect Habitats	• Over the past two decades, numerous projects have sought to restore dormouse habitat and to connect fragments of habitats that are isolated. Targeted habitat management includes: - Bring woodlands into appropriate management e.g. coppicing. - Manage the canopy to reduce understory shading. - Control deer populations to sustainable levels to reduce browsing pressure. - Facilitate the development of a connected, shrub species rich and structurally complex, woodland understory. - Increase permeability in the urban and wider environment eg green bridges, suitable underpasses. - Bring hedgerows into lifecycle management including periodic rejuvenation. - Establish more hedgerow trees. - Establish species rich hedgerows. - Promote hedgerow management that routinely benefits wildlife such as incremental trimming and longer trimming rotations. - Lay or coppice hedgerows which have passed their peak maturity to encourage dense base regrowth and ensures another lifecycle. - Promote the importance of field margins to maximise their benefits for terrestrial mammals. - Promote reduced, targeted and responsible use of pesticides and herbicides. - Coppicing roadside diverse scrub verges on long rotations (10-15 years) increases suitability of habitat for dormice - New road developments should aim to establish a diverse roadside wooded habitat, particularly if the road is adjacent to suitable dormouse habitat or dormouse records exist within the area.
Other Relevant Measures	
Species-specific action: Support for reintroduction.	• Follow a planned programme for reintroduction to improve genetic diversity; dormice are released at two or more sites in close proximity, so that populations can bolster each other.
Species-specific action: Managing woodlands for dormice.	•Selective felling, coppicing and ride management to increase the extent, diversity and connectivity of understory in woodlands. Maintain and improve woodland rides and woodland edges by opening the canopy, to limit over-shading • Managing Sustainable management of deer populations, which can inhibit understory development due to browsing.
Other Linked Assemblage Benefits	
Native Woodland; Trees Outside of Woodlands; Farmed Landscapes	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub	

Intermediate stonewort

Chara intermedia

Table 48. Intermediate stonewort measures

Suitable Habitats	
	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.
Primary Measure	
Translocation	• Translocate stoneworts to appropriate sites to support population establishment.
Other Relevant Measures	
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.
Other Linked Assemblage Benefits	
Still Waters	
These measures could offer solutions to address pressures in:	
Freshwater;	

Kittiwake

Rissa tridactyla

Table 49. Kittiwake measures

Suitable Habitats	
	Nests on maritime cliffs and buildings close to the coast
Primary Measure	
Species Specific Action	• Ensure the protection of important habitat/sites for both nesting and foraging. Need to work with local communities to facilitate urban breeding success. Build purpose built structures in coastal locations on which birds can nest (aka 'kittiwake hotels')*.
Other Relevant Measures	
Air pollution reduction & mitigation and offshore wind turbines or tidal energy projects - energy infrastructure	• Habitat enhancement where appropriate, (using SeaMaST tool as an example), to link mitigation for offshore wind farm and wave/tidal energy developments in terms of impacts on food availability or collisions.
Fisheries Management	• Where possible within the scope of the LNRS, protect important populations of sandeels, clupeids (sprat and herring) from over exploitation.*
Other Linked Assemblage Benefits	
Farmed Landscapes; Reedbeds and Freshwater Wetlands; Lowland Meadows and Pasture	
These measures could offer solutions to address pressures in:	
Coastal	

*This can be supported by similar measures offshore, which would be considered outside of the scope of the current LNRS.

Lapwing

Vanellus vanellus

Table 50. Lapwing measures

Suitable Habitats	
	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.
Primary Measure	
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 wetland features and habitats. - Maintaining short swards on wet pastures through grazing and cutting regimes outside of the breeding season. • Additional 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.
Other Relevant Measures	
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.
Other Linked Assemblage Benefits	
Farmed Landscapes; Reedbeds and Freshwater Wetlands; Lowland Meadows and Pasture	
These measures could offer solutions to address pressures in:	
Coastal; Farmland; Woodland, Trees and Scrub; Freshwater; Grassland and Heathlands	

Little whirlpool ramshorn snail

Anisus vorticulus

Table 51. Little whirlpool ramshorn snail measures

Suitable Habitats	
	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.
Primary Measure	
Habitat Creation and Management	• Create new habitats, including ditch systems, and remove fish species such as carp that increase turbidity.
Other Relevant Measures	
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 ecosystem, 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.
Other Linked Assemblage Benefits	
Still Waters; Reedbeds and Freshwater Wetlands; Lowland Fen	
These measures could offer solutions to address pressures in:	
Coastal; Farmland; Freshwater	

Narrow-mouthed whorl snail

Orgyia recens

Table 52. Narrow-mouthed whorl snail measures

Suitable Habitats	
	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.
Primary Measure	
Habitat Improvement	• Prevent afforestation to maintain open habitat conditions suitable for the species.
Other Relevant Measures	
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.
Other Linked Assemblage Benefits	
Still Waters; Rivers and Riverside Habitats; Lowland Fen; Reedbeds and Freshwater Wetlands	
These measures could offer solutions to address pressures in:	
Freshwater; Farmland	

Natterjack toad

Epidalea calamita

Table 53. Natterjack toad measures

Suitable Habitats	
	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.
Primary Measure	
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 (e.g., 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.
Other Relevant Measures	
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.
Other Linked Assemblage Benefits	
Still Waters; Coastal Shingle and Dunes; Saltmarshes and Lagoons; Acid Grassland and Heathland	
These measures could offer solutions to address pressures in:	
Coastal; Farmland; Woodland, Trees and Scrub; Freshwater; Urban and Built; Invasive Species and Diseases;	

Orange-fruited elm lichen

Caloplaca luteoalba

Table 54. Orange-fruited elm lichen measures

Suitable Habitats	
	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.
Primary Measure	
Land Management Techniques	• Manage veteran and ancient trees to benefit this species. • Identify younger suitable trees (eg field maple, sycamore) 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.
Other Relevant Measures	
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).
Other Linked Assemblage Benefits	
Native Woodland; Trees Outside of Woodlands	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Urban and Built; Invasive Species and Diseases;	

Rosser's Sac-spider

Clubiona rosserae

Table 55. Rosser's Sac-spider measures

Suitable Habitats	
	Fens; Confined to fens where it is found among cut sedge and reeds and in sedge tussocks.
Primary Measure	
Land Management Practices	• Maintain a high ground water table using soil and water emanagement, minimising inappropriate drainage.
Other Relevant Measures	
Land Management Practices	• Prevent carr woodland encroaching on open sedge beds by a regime of annual mowing and grazing.
Other Linked Assemblage Benefits	
Farmed Landscapes; Acid Grassland and Heathland; Native Woodland; Lowland Fen	
These measures could offer solutions to address pressures in:	
Farmland; Freshwater	

Scarce vapourer

Orgyia recens

Table 56. Sacrce vapourer measures

Suitable Habitats	
	Typically occurs in lowland sandy heaths, wet woodlands, fens, bogs, and hedgerows. Reliant on barberry plants.
Primary Measure	
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.
Other Relevant Measures	
ranslocation/ 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.
Other Linked Assemblage Benefits	
Farmed Landscapes; Acid Grassland and Heathland; Native Woodland; Lowland Fen	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Grassland and Heathlands	

Serotine bat

Eptesicus serotinus

Table 57. Serotine bat measures

Suitable Habitats	
	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.
Primary Measure	
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 establish enhance and/or create new 'dark commuting corridors' of appropriate habitat between roosting and foraging areas. In contrast, artificial illumination should be provided if nec-essary in foraging areas, to maximise feeding opportunities.
Other Relevant Measures	
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 (e.g. 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
Other Linked Assemblage Benefits	
Native Woodland; Trees Outside of Woodlands; Urban, Built and Garden Environments; Farmed Landscapes; Lowland Measures and Pastures	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Grassland and Heathlands, Urban and Built;	

Starlet sea anemone

Nematostella vectensis

Table 58. Starlet sea anemone measures

Suitable Habitats	
	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.
Primary Measure	
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
Other Relevant Measures	
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.
Other Linked Assemblage Benefits	
Saltmarshes and Lagoons; Coastal Shingle and Dunes	
These measures could offer solutions to address pressures in:	
Coastal	

Starry Breck Lichen

Buellia asterella

Table 59. Starry Breck Lichen measures

Suitable Habitats	
	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 and Breckland. In recent decades, it has been known in Great Britain from open stony (flinty) and sandy grasslands in the Brecks.
Primary Measure	
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.
Other Relevant Measures	
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.
Other Linked Assemblage Benefits	
Brecks Grass Heath; Chalk Grassland	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Grassland and Heathlands	

Suffolk lungwort

Pulmonaria obscura

Table 60. Suffolk lungwort measures

Suitable Habitats	
	An understory 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.
Primary Measure	
Species-Specific Action	• Continue coppice management to maintain suitable habitat conditions. • Employ developed plant propagation techniques and eestablish re-introduced populations at appropriate locations
Other Relevant Measures	
Landscape Habitat Creation, Expansion, and Connectivity	• Improve woodland connectivity to link fragmented habitats. • Buffer existing sites to enhance their ecological resilience.
Other Linked Assemblage Benefits	
Native Woodland; Trees Outside of Woodland	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub;	

Water vole

Arvicola amphibius

Table 61. Water vole measures

Suitable Habitats	
	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.
Primary Measure	
Management of Problematic Invasive Species: Mink Control	• Monitor mink distribution and reduce numbers 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.
Other Relevant Measures	
Habitat Restoration and Enhancement: Restore watercourses and marginal vegetation to their natural state.	• Sympathetic management of river banks and ditches: - 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
Other Linked Assemblage Benefits	
Still Waters; Rivers and Riverside Habitats; Lowland Fen; Reedbeds and Freshwater Wetlands	
These measures could offer solutions to address pressures in:	
Farmland; Woodland, Trees and Scrub; Freshwater	

White-clawed crayfish

Austropotamobius pallipes

Table 62. White-clawed crayfish measures

Suitable Habitats	
	Found in lakes, ponds, rivers, chalk rivers, and potentiallybrownfield 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.
Primary Measure	
Habitat Creation and Creating In-Water Refuges	• Place cobbles, boulders, bricks, breeze blocks, or hessian sacks along riverbanks and margins to provide shelter.
Other Relevant Measures	
Habitat Creation	• Plant trees such as alder and willow along riverbanks to create shaded areas and exposed root systems suitable for crayfish colonisation. Place cobbles, boulders, bricks, breeze blocks, or hessian sacks along riverbanks and margins to provide shelter.
Catchment Management	• Maintain high water levels by implementing buffer strips, restricting cattle access, and other sustainable practices.
Captive Breeding Programme	• Support population recovery through captive breeding initiatives.
Removal of Invasive Species	• Actively manage and remove invasive species to reduce competition and threats.
Other Linked Assemblage Benefits	
Rivers and Riverside Habitats; Still Waters	
These measures could offer solutions to address pressures in:	
Freshwater; Woodland, Trees and Scrub; Invasive Species and Diseases	

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 is 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 we 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 Waveney, a 6 km stretch of the mid-Yare, and 2km of the Thurne.

Adult female Fen Raft Spider
©

Volunteers training to monitor new Fen Raft Spider Populations
©

How did we 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 investigation the possibility of developing eDNA methods for monitoring this species, potentially making it much easier to detect future range changes.

Find out more by visiting https://www.dolomedes.org.

Locations of Key Species across Suffolk

To support identification of potential measures within the spatial strategy, data on the recorded locations of the key species, provided by SBIS (Suffolk 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 10)** and species richness **(Figure 11)** 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 10. A map to indicate where the key species indicated in the LNRS can be found across Suffolk in terms of numbers of records

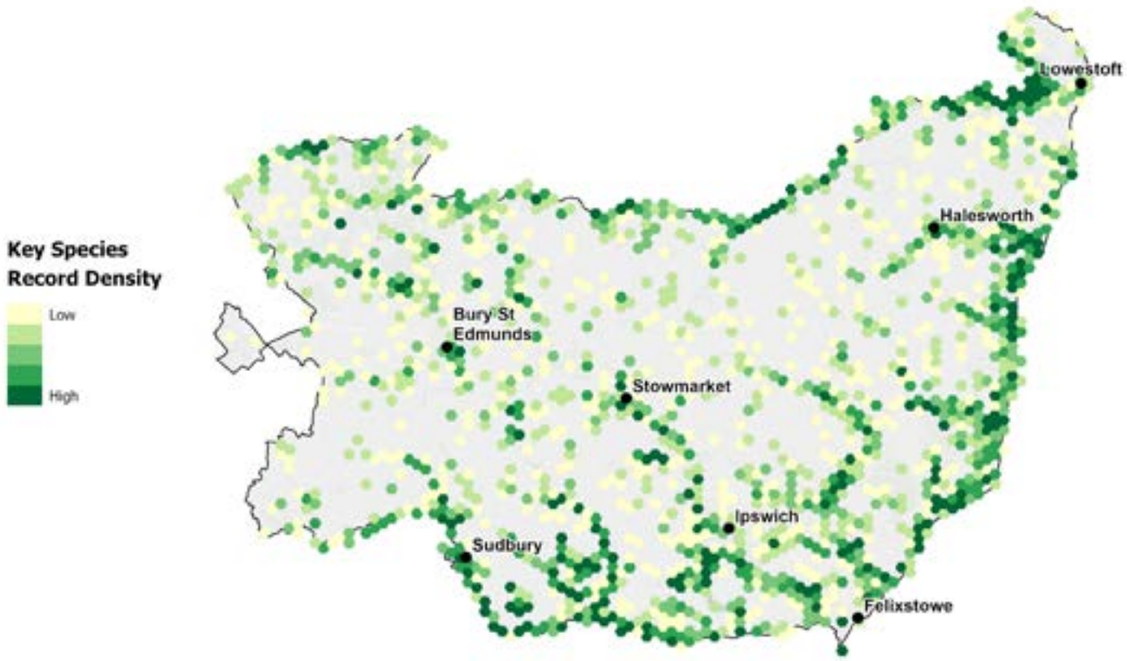
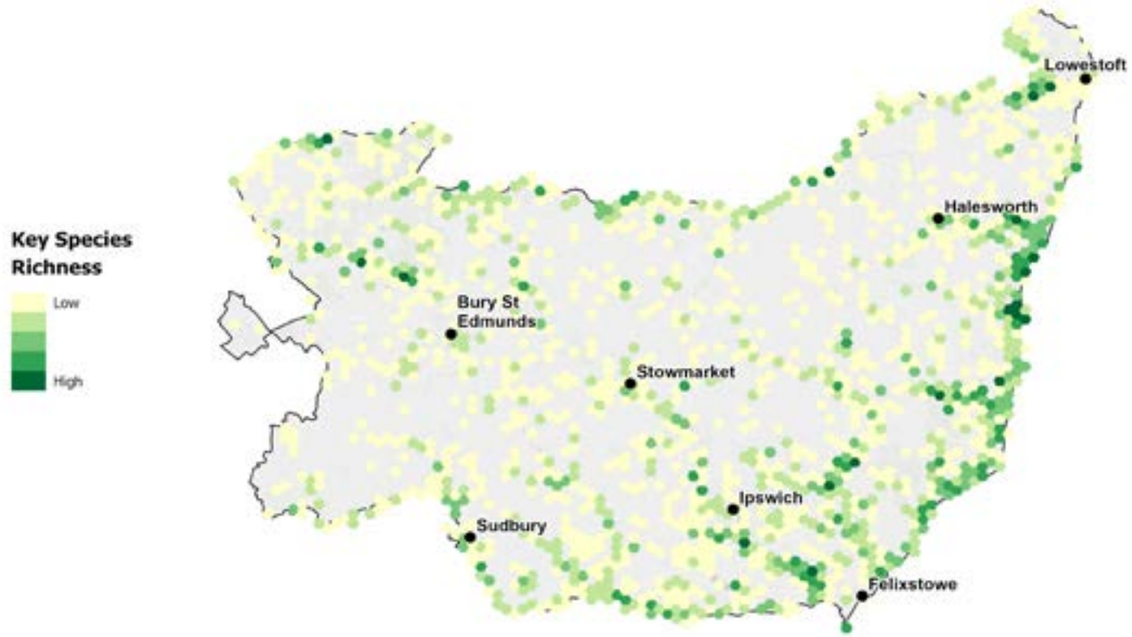


Figure 11. A map to indicate how many of the key species indicated in the LNRS can be found in locations across Suffolk – the species richness.



Part D: Locations for Action

Image: Ancient oak trees in Staverton Woods
© Gill Moon/National Landscapes

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; Suffolk's Priority Habitats, Assemblages and Measures**. The purpose of mapping the measures is to create a shared vision of locations where habitat action could be focused by 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. A summary map of those areas identified that could become of particular importance for biodiversity (ACB) is given in **Figure 12.**

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.

Not all of the measures are mapped onto the **Local Habitat Map**. All of the potential measures below 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 approximately 70% of the measures.

As part of the engagement process, we requested input from stakeholders for sugges-tions 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 prioritisa-tion of potential measures. **Table 63** below 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 63. Proportion of stakeholder mapping inputs which overlap with APIB and ACB areas.

Overlap %	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%

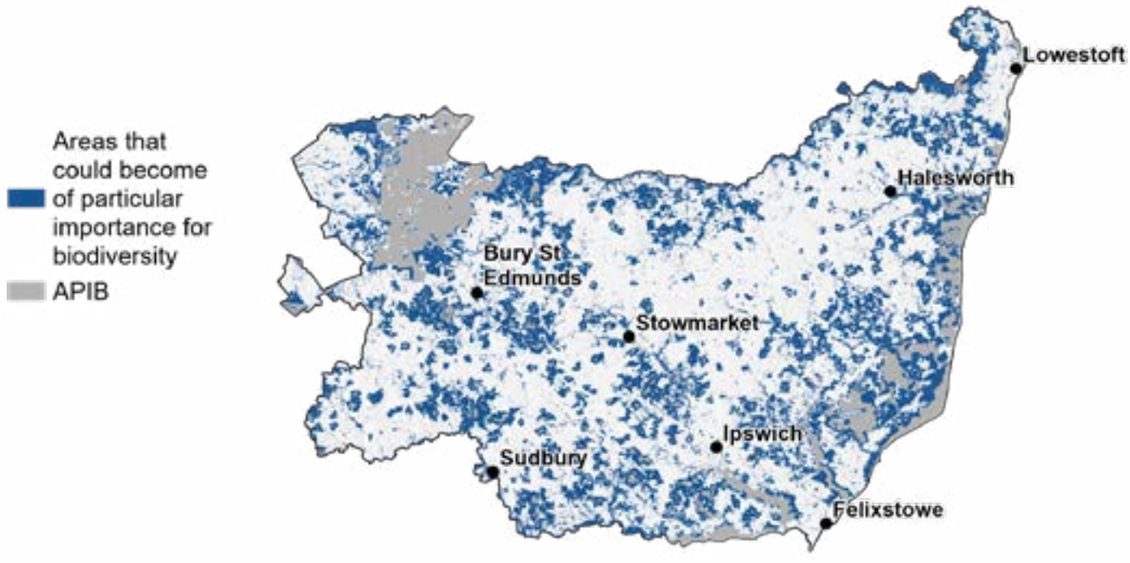
Table 64. Species distribution in relation to identified APIB and ACB areas.

Species	% of records within 50m of APIB area	% of records within 50m of ACB area	% of records within 50m of APIB or ACB
Basil-thyme Case-bearer	77	39	98
Crested Buckler-fern	93	13	99
Crested Cow-wheat	100	100	100
Curlew	44	67	78
Dwarf Eelgrass	100	0	100
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
One-grooved Diving Beetle	83	51	100
Orange-Fruited Elm-Lichen	0	50	50
Pool Frog	100	0	100
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**

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.

Figure 12. Suffolk's Areas that Could Become of Particular Importance for Biodiversity



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 Suffolk, 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 a 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 Suffolk 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 provide opportunities of support where appropriate.

Locations for Action

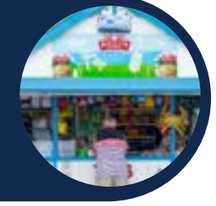
For eNGOs and ecologists

- 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 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.

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.

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 Suffolk.

Nature as a respite

Healing woods

In 2021, recognising how access to nature and greenspace had helped people's mental health and wellbeing during the Covid-19 lockdowns, Suffolk County Council launched its 'Healing Woods' intiative.

Haeling Woods aimed to:

- Improve the health and wellbeing of people through access to woodland and natural greenspace
- Create spaces that encourage nature and help people to experience it, as a positive legacy from the impact of the pandemic
- Increase access to woodland and natural greenspace where it is most needed.

An initial public survey showed there was appetite for the project - over 90% of the 500 responses were in support.

The Council invited expressions of interest from communities across Suffolk and chose four to work with to test the approach and generate learning to help with potential scaling up of the project.

Who is involved?

The four Healing Wood projects are at Hopton, Eye, Little Finborough, and Howard Community Academy, Bury St Edmunds.

Each project has been community led, and involved a range of local groups, businesses, the landowners and volunteers from the community.

The county council provided seed-corn funding to each project, which have also been able to access funds and support from a variety of other local sources. The Woodland Trust and Suffolk Tree Warden Network have also provided invaluable support.

Tree planting at Howard Community Academy
© Abberycroft Leisure

Children, staff, community members, volunteers and councillors help to plant trees at Howard Community Academy, Bury St Edmunds
© Suffolk County Council

What have we achieved?

Each Healing Wood project has employed a range of approaches to delivering its aims. They have all been community-led, which will be essential to their long-term management and success. SCC will be using the lessons learned to help similar projects across the county.

Hopton - Hopton Community Woodland Group has transformed a former rubbish tip into a small oasis for wildlife and people. 0.4ha of woodland and 130m of hedging has been planted by local volunteers and school children, with access improvements including 2 benches.

Eye - the Eye Town Moors Woodland Society and Eye Outdoors Group have enhanced an existing area of woodland and created a new Way of Healing to connect existing public footpaths in the village and provide a selection of circular walks. 5.6 ha of woodland has been enhanced for community access, including removal of diseased ash trees, replanting new trees, and adding picnic tables, benches and notice boards.

Oaks Meadow, Little Finborough – a 4-acre former arable field has been developed into a nature-based community hub with sensory gardens, and an orchard, allotment, wildlife pond, playground and toilet facilities.

The Oaks Meadow Trust has brought together local volunteers, community groups, Suffolk Rural College students, and groups that aim to boost confidence and enhance the well-being of vulnerable young girls through social action. 0.4ha of woodland and 225m of hedgerow have been planted.

Howard Community Academy – Over a 3-year period, around 3,000 trees have beenwere planted on a 1.84-hectare unused school playing field to create a community woodland in the heart of a Bury St Edmunds housing estate.

Howard Primary School staff and pupils, working with Abbeycroft Leisure, The Woodland Trust, Bury Town Council and other local sponsors and supporters have come together to realise an area for nature and quiet enjoyment that will provide an educational and community resource for many decades to come.

Appendices

Grey Heron perched on a post in The Broads. This is one of the species on the Suffolk Long List.
© Ian Kennedy/Adobe Stock

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. Suffolk and Norfolk'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 Suffolk 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.

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 Suffolk and Norfolk 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. **Table 65** gives an overview of the types and number of documents analysed.

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 66** gives an example of how one action was categorised into a priority and then assigned to an overarching nature recovery principle.

Any additional information included in a policy, measure or recommendation, such as any specific locations, wider environmental benefits (e.g. improving air quality) or non-environmental co-benefits (e.g. improving health and wellbeing) were also recorded.

Table 65. Type and number of documents analysed for nature recovery measures.

Planning Documents	**160**	
	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
Climate Strategies	**2**	
	2	County Climate Plans/Strategies
Ecological Audits, Plans and Strategies	**95**	
	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
Management Plans and Strategies	**27**	
	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)
Guidance and Enagement Documents	**8**	
	8	Pieces of national stakeholder LNRS guidance
		Engagement opportunity outputs: Individual meetings, discussions etc.

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.

Table 66. 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

Methodology: Species and habitat priority generation

This 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
- 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.

Within Suffolk and Norfolk, there are several Protected Landscapes (the Broads National Park and the National Landscape areas of Norfolk Coast, Suffolk and Essex Coast and 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).

Creation of Biodiversity and Habitat Priorities

Figure 12 indicates the stages, processes and inputs required to generate the habitat-based priorities for Suffolk and Norfolk.

Species Priorities

Figure 13 indicates the stages, processes and inputs required to generate the species-based long list and short list, and related priority measures for Suffolk and Norfolk.

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 Suffolk and Norfolk's rare and threatened species is challenging. The LNRS has been supported by the Suffolk and Norfolk Biodiversity Information Services (SBIS and NBIS) 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.

Figure 13. Processes and inputs for Habitat-Based Priorities

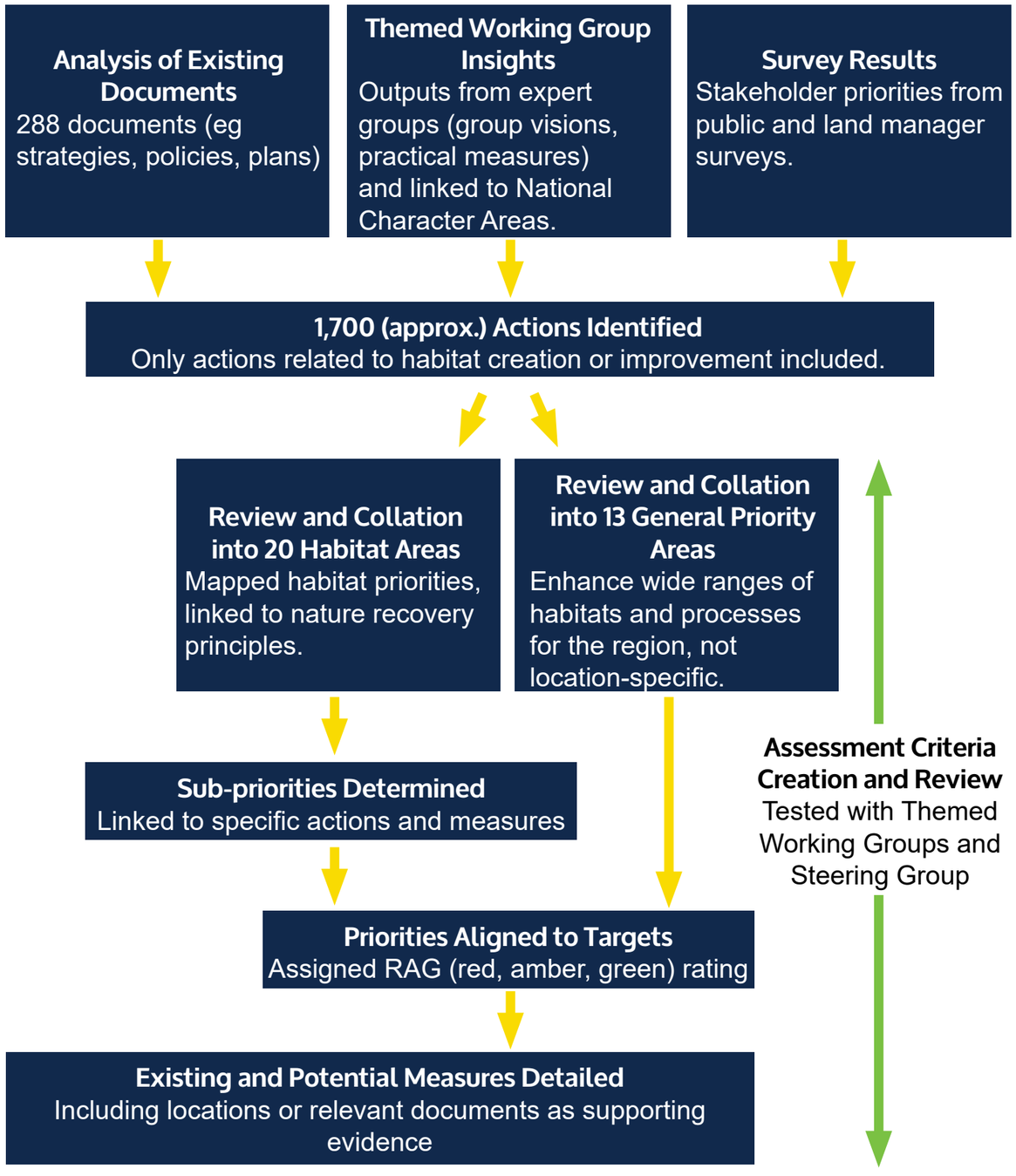


Figure 14. Species longlist and prioritisation process

Local Record Centres (NBIS and SBIS), with advice from county recorders, provided data based on these criteria:

- 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 re-establishing or rediscovered
- Species identified by Natural England for conservation translocation or requiring scaled-up translocation efforts for success

National Landscape and Broads Authority Strategy Focus Species

Natural England National Character Area Priority Species List

Stakeholder Inputs
Including public and land manager surveys, public engagement events and Themed Working Group outputs

Flagship, Strategy, and Focus Species Identified by Environmental NGOs
Including Norfolk Wildlife Trust, Suffolk Wildlife Trust, RSPB, Bat Conservation Trust, and Amphibian and Reptile Conservation Trust

Document Analysis
Reviewed ~300 documents (see **Appendix 1**)

1,600+ Species Identified
Across Norfolk and Suffolk with justifications based on IUCN, conservation status, local significance

Species Assessment
Individually assessed using criteria-based system. Species progressed to next phase if supported by evidence from experts and Natural England Species Evidence Base.

IUCN status of Near Threatened or higher, with High or Medium Conservation Priority

Appropriate Species Action Categories (Natural England)
Species in categories (B) Targeted habitat management; (C) Environmental improvements and (D) Bespoke, complex conservation were considered suitable for LNRS support.

Assessment Criteria Creation and Review
Tested with Themed Working Groups and Steering Group

List of 260+ Species Assessed and Ranked
Each species was quantitatively scored based on:

- **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 (eg 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 scored species were ranked and assigned a priority level of 'Urgent,' 'High,' 'Medium,' or 'Low' based on their total score

Designation of Priority Species and Assemblages
All species scored as 'Urgent' or 'High' were reviewed and designated as either:

- **Key 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 with a flagship species to serve as a public engagement symbol and a success indicator for conservation efforts.

Detailed Measures and Supporting Evidence
Appropriate existing and potential measures for Key Priority Species and Assemblages are outlined, with locations and relevant documents provided as supporting evidence.

Longlist of Species and Support
Full species longlist for each county available online. All listed species will benefit from LNRS measures through the creation and enhancement of high-quality habitats in suitable locations. Medium- and low-priority species not included in the final shortlist are identified, highlighting those expected to receive significant support within the counties.

Expert Review and Final Approval
Species and assemblage details reviewed by experts and stakeholders through discussions and workshops. Final lists approved by the Steering Group.

Full Suffolk species shortlist

Table 67. Key Species

Common Name(s)	Scientific Name	Taxon Group
Basil-thyme Case-bearer	*Coleophora tricolor*	Invertebrates
Bark-sulphur firedot	*Caloplaca flavorubescens*	Lichen and Fungi
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
Hazel Dormouse	*Muscardinus avellanarius*	Mammals
Intermediate Stonewort	*Chara papillosa*	Non-Vascular Plants
Kittiwake	*Rissa tridactyla*	Birds
Lapwing	*Vanellus vanellus*	Birds
Little Whirlpool Rams-horn Snail	*Anisus (Disculifer) vorticulus*	Invertebrates
Narrow-mouthed Whorl Snail	*Vertigo angustior*	Invertebrates
Natterjack	*Epidalea calamita*	Reptiles and Amphibians
Orange-Fruited Elm-lichen	*Caloplaca luteoalba*	Lichen and Fungi
Rosser's sac-spider	*Clubiona roserae*	Invertebrates
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

Full Suffolk species shortlist

Appendix 2.

Table 68. Assemblage Species

Common Name(s)	Scientific Name	Taxon Group
A beetle	*Lycoperdina succincta*	Invertebrates
A firedot lichen	*Caloplaca virescens*	Lichen and Fungi
A fly	*Erioptera bivittata*	Invertebrates
A jumping spider	*Neon valentulus*	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
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
Brown Hairstreak	*Thecla betulae*	Invertebrates
Bullfinch	*Pyrrhula pyrrhula*	Birds
Bur Medick	*Medicago polymorpha*	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
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

Full Suffolk species shortlist

Table 68. Assemblage Species continued

Common Name(s)	Scientific Name	Taxon Group
Devil's-bit Scabious	*Succisa pratensis*	Vascular Plants
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 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/The Brecks 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
Golden Hoverfly	*Callicera spinolae*	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 Butterfly-orchid	*Platanthera chlorantha*	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
Heath Dog-violet	*Viola canina*	Vascular Plants
Hedgehog	*Erinaceus europaeus*	Mammals
Hen Harrier	*Circus cyaneus*	Birds
Hornbeam	*Carpinus betulus*	Vascular Plants
House Martin	*Delichon urbicum*	Birds
House Sparrow	*Passer domesticus*	Birds
Interrupted Brome	*Bromus interruptus*	Vascular Plants

Full Suffolk species shortlist

Table 68. Assemblage Species continued

Common Name(s)	Scientific Name	Taxon Group
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 Tit	*Poecile palustris subsp. palustris/dresseri*	Birds
Military Orchid	*Orchis militaris*	Vascular Plants
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
Pashford Pot Beetle	*Cryptocephalus exiguus*	Invertebrates
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
Prostrate Perennial Knawel	*Scleranthus perennis subsp. prostratus*	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

Full Suffolk species shortlist

Table 68. Assemblage Species continued

Common Name(s)	Scientific Name	Taxon Group
Scarce Pug	*Eupithecia extensaria subsp. oc-cidua*	Invertebrates
Sea Barley	*Hordeum marinum*	Vascular Plants
Sea-heath	*Frankenia laevis*	Vascular Plants
Seaside Pansy	*Viola tricolor subsp. curtisii*	Vascular Plants
Sheet weaver spider	*Agyneta fuscipalpa*	Invertebrates
Shepherd's-needle	*Scandix pecten-veneris*	Vascular Plants
Silver Studded Blue	*Plebejus argus*	Invertebrates
Skylark	*Alauda arvensis*	Birds
Slender Tare	*Vicia parviflora*	Vascular Plants
Small Cord-grass	*Spartina maritima*	Vascular Plants
Small Leaved LIme	*Tilia cordata*	Vascular Plants
Small-flowered Catchfly	*Silene gallica*	Vascular Plants
Spider	*Centromerus semiater*	Invertebrates
Spider	*Gongylidiellum murcidum*	Invertebrates
Spined Loach	*Cobitis taenia*	Fish
Spiny Restharrow	*Ononis spinosa*	Vascular Plants
Spotted Cat's-ear	*Hypochaeris maculata*	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
Thorned Yellow Splay	*Erioptera meijerei*	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 Admiral	*Limenitis camilla*	Invertebrates
White Letter Hairstreak	*Satyrium w-album*	Invertebrates
Whooper swan	*Cygnus cygnus*	Birds
Wild Pansy	*Viola tricolor*	Vascular Plants

Full Suffolk species shortlist

Table 68. Assemblage Species continued

Common Name(s)	Scientific Name	Taxon Group
Wild Service Tree	*Sorbus torminalis*	Vascular Plants
Willow Tit	*Poecile montanus*	Birds
Wolf Spider	*Hygrolycosa rubrofasciata*	Invertebrates
Woodlark	*Lullula arborea*	Birds
Wormwood moonshiner	*Amara fusca*	Invertebrates
Yellow Vetchling	*Lathyrus aphaca*	Vascular Plants
Yellow Wagtail	*Motacilla flava*	Birds
Yellowhammer	*Emberiza citrinella*	Birds
Yellow-vetch	*Vicia lutea*	Vascular Plants
Yew	*Taxus baccata*	Vascular Plants
Zircon Reed Beetle	*Donacia aquatica*	Invertebrates

Full Suffolk species shortlist

Table 69. Scored Species Expected to Benefit from proposed LNRS Measures

Common Name(s)	Scientific Name	Taxon Group
A beetle	*Pseudotriphyllus suturalis*	Invertebrates
A lichen	*Bellicidia incompta*	Lichen and Fungi
A lichen	*Calicium notarisii*	Lichen and Fungi
A lichen	*Cladonia rei*	Lichen and Fungi
A lichen	*Cliostomum corrugatum*	Lichen and Fungi
A lichen	*Gyalecta flotovii*	Lichen and Fungi
A lichen	*Lecanora sublivescens*	Lichen and Fungi
A lichen	*Porina rosei*	Lichen and Fungi
A lichen	*Psora decipiens*	Lichen and Fungi
A lichen	*Ramonia chrysophaea*	Lichen and Fungi
A lichen	*Roccella phycopsis*	Lichen and Fungi
A lichen	*Thalloidima physaroides*	Lichen and Fungi
A long toed water beetle	*Dryops anglicanus*	Invertebrates
Bewick's Swan (Tundra Swan)	*Cygnus columbianus bewickii*	Birds
Common Cudweed	*Filago vulgaris*	Vascular Plants
Coot	*Fulica atra*	Birds
Corn Spurrey	*Spergula arvensis*	Vascular Plants
Cross-leaved Heath	Erica tetralix	Vascular Plants
Divided Sedge	Carex divisa	Vascular Plants
Dwarf Stonewort	*Nitella tenuissima*	Non-Vascular Plants
Eurasian Red Squirrel	*Sciurus vulgaris*	Mammal
Field Mouse-ear	*Cerastium arvense*	Vascular Plants
Fine-leaved Sandwort	*Minuartia hybrida*	Vascular Plants
Flat-sedge	*Blysmus compressus*	Vascular Plants
Fritillary	*Fritillaria meleagris*	Vascular Plants
Frogbit Smut	*Tracya hydrocharidis*	Lichen and Fungi
Goldeneye	*Bucephala clangula*	Birds
Grape-hyacinth	*Muscari neglectum*	Vascular Plants
Gypsy Moth	*Lymantria dispar*	Invertebrates
Harebell	*Campanula rotundifolia*	Vascular Plants
Heath Milkwort	*Polygala serpyllifolia*	Vascular Plants
Heath Speedwell	*Veronica officinalis*	Vascular Plants
Hoary Plantain	*Plantago media*	Vascular Plants
Jumping spider	*Marpissa radiata*	Invertebrates
Large Copper	*Lycaena dispar*	Invertebrates
Least Lettuce	*Lactuca saligna*	Vascular Plants
Maiden Pink	*Dianthus deltoides*	Vascular Plants
Moorhen	*Gallinula chloropus*	Birds
Mousetail	*Myosurus minimus*	Vascular Plants

Full Suffolk species shortlist

Appendix 2.

Table 69. Scored Species Expected to Benefit from proposed LNRS Measures continued

Common Name(s)	Scientific Name	Taxon Group
Musk orchid	*Herminium monorchis*	Vascular Plants
Osprey	*Pandion haliaetus*	Birds
Oxlip	*Primula elatior*	Vascular Plants
Pillwort	*Pilularia globulifera*	Non-Vascular Plants
Ragged-Robin	*Silene flos-cuculi*	Vascular Plants
Rare Spring-sedge	*Carex ericetorum*	Vascular Plants
Red-breasted Merganser	*Mergus serrator*	Birds
Sainfoin	*Onobrychis viciifolia*	Onobrychis viciifolia
Sanicle	*Sanicula europaea*	Vascular Plants
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
Shepherd's Cress	*Teesdalia nudicaulis*	Vascular Plants
Shingle spider	*Neon pictus*	Invertebrates
Small Blue	*Cupido minimus*	Invertebrates
Small Cudweed	*Filago minima*	Vascular Plants
Small Heath	*Coenonympha pamphilus*	Invertebrates
Smooth Cat's-ear	*Hypochaeris glabra*	Vascular Plants
Spider	*Pelecopsis radicicola*	Invertebrates
Spider	*Phaeocedus braccatus*	Invertebrates
Spider	*Trichoncus hackmani*	Invertebrates
Tiny Earthstar	*Geastrum minimum*	Lichen and Fungi
Tormentil	*Potentilla erecta*	Vascular Plants
Whinchat	*Saxicola rubetra*	Birds
Witches' Whiskers Lichen	*Usnea florida*	Lichen and Fungi
Wolf Spider	*Arctosa fulvolineata*	Invertebrates
Wryneck	*Jynx torquilla*	Birds

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'.

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 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 70**.

Part 2. Identify areas and land parcels that could become of particular importance for biodiversity (ACBs)

A number of separate components indicating areas of strategic significance were combined to produce an overall map of ACBs. Multiple different datasets were considered and assessed to determine their suitability for mapping areas of strategic significance across the two strategy areas. Each component is detailed below:

- **Lawton Zones:** A 250m 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).
- **Churchyards:** A 250m buffer around churchyards, which can provide small stepping-stones of semi natural or natural habitat across the strategy areas.
- **Deep peaty soils:** The extent of deep peat represents important fenland areas in Suffolk and Norfolk, as well as areas with associated carbon storage and water regulation benefits.
- **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.
- **Rivers:** A 50m buffer around major rivers, which offer vital habitat and connectivity through the landscape.
- **Barbastelle bats:** A 3.5 km buffer around known roost sites.

Table 70. 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			

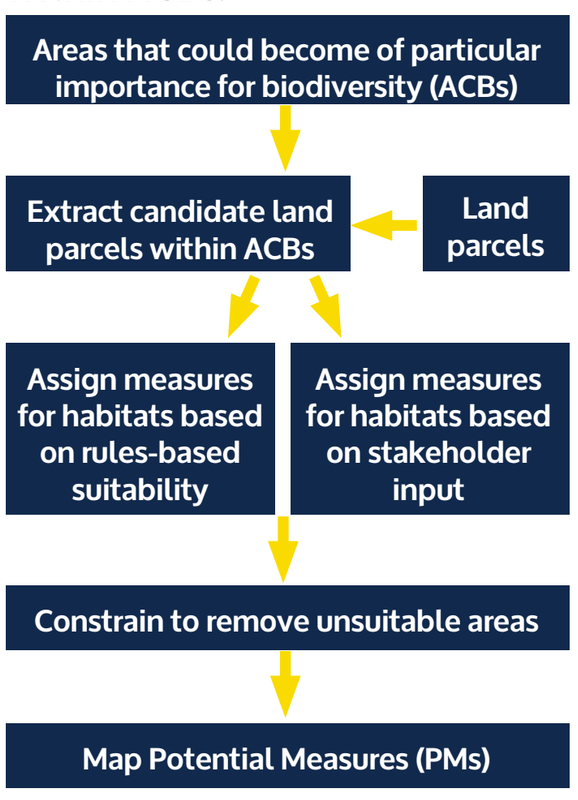
1 Marine Conservation Zones fall outside of the LNRS strategy boundary but are still included.

Land parcels within or mostly within these areas were extracted to form the final ACB map and formed the baseline of candidate sites for potential measures to 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.

Part 3. Mapping Potential Measures (PMs)

A dual approach of stakeholder input and 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'. A summary is presented in **Figure 14**.

Figure 15. Overview of process for mapping potential measures within ACBs.



Geospatial Rules-based Mapping of Measures

This 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).
- **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.

Constraints on suitable areas were also incorporated, such as proximity to existing airfields, scheduled monuments, and sites allocated for development through local plans.

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.

Part IV: Species Mapping and Prioritisation

The key species identified within the statement of biodiversity priorities were mapped using records from the Suffolk Biodiversity Information Service (SBIS). 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 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.

Mapping in action at a Themed Working Group workshop in March 2024
© Eva Wilkes / NCC

Methodology: Engagement and consultation

DEFRA's 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. This broad involvement ensured inclusivity and represented varied perspectives. A public consultation was also held before the LNRS was published, with engagement conducted through multiple formats:

Events (7)

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

Presentations (17)

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

Social media and websites

- Engagement through social media platforms
- News updates on websites
- Information distribution via email

Surveys (2)

- Public opinion surveys
- Surveys for target groups

Webinars (12)

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

Workshops (15)

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

Figure 16. Numbers of people engaged through Suffolk-led and NSNRP efforts during the LNRS delivery timeline.

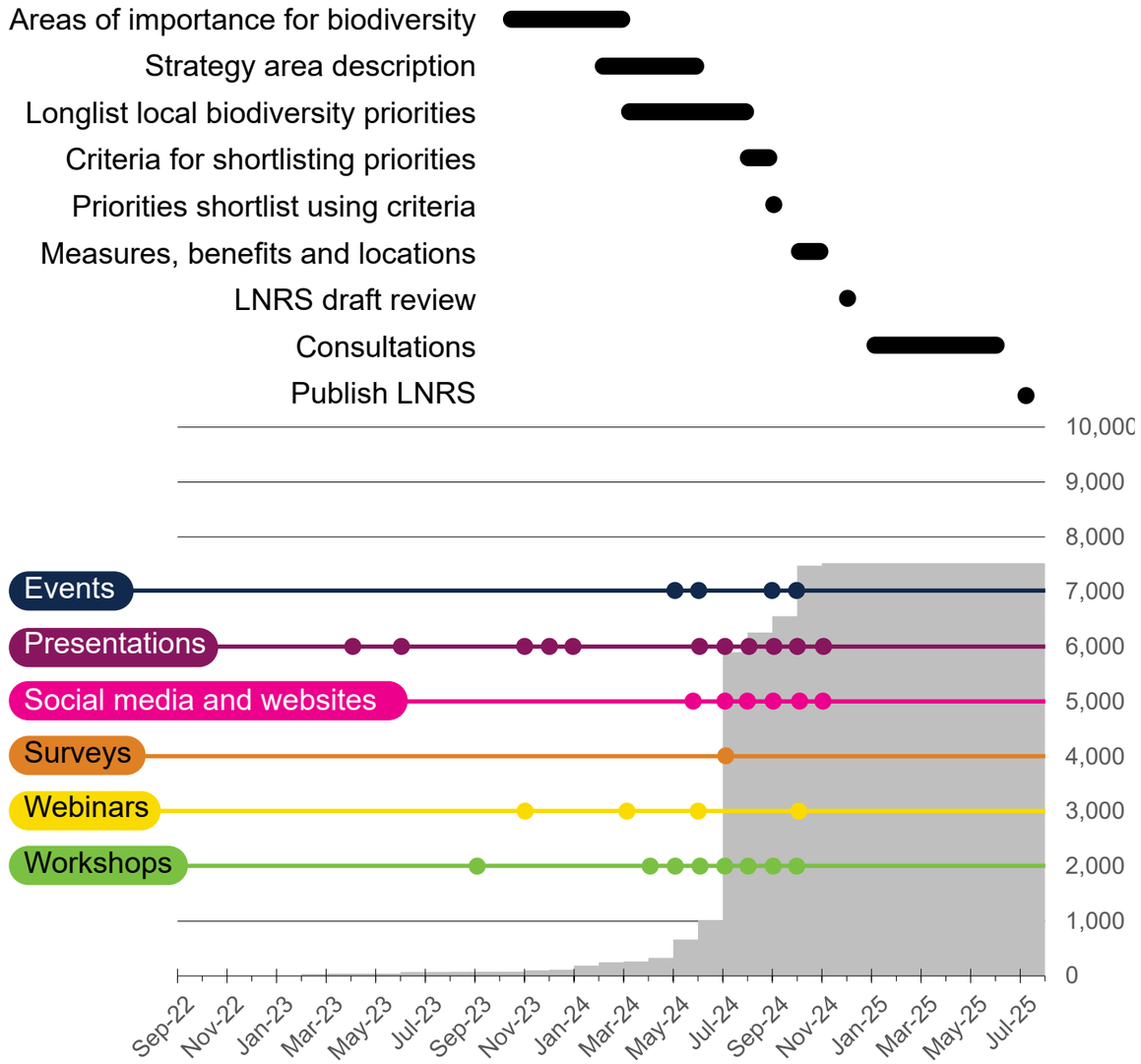


Figure 16. Engagement numbers for Suffolk-led and NSNRP activities during the LNRS timeline. Key strategy milestones are shown above, while engagement activities - events (blue), presentations (purple), social media and websites (pink), surveys (orange), webinars (yellow), and workshops (green) - are displayed below with timelines indicating their occurrence. The grey area represents cumulative engagement, showing the growing reach to over 7,500 people through these activities and stakeholder interactions over the timeline.

Images opposite, top to bottom: Royal Norfolk Show 2024, Presentation to Norfolk Planning themed working group © M. Swinfen/NCC; LNRS Public Survey advert on the NCC Facebook page; Public opinion voting boxes at the Royal Norfolk Show 2024 © M. Swinfen/NCC; Woman watching webinar on her laptop © Neil/Adobe Stock and Land Management themed working group © M.Swinfen/NCC.

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 nature 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 till mid-2025 is the development of a strategy for each county.

Image: Suffolk Planning Themed Working Group meeting in October 2024.
© M. Swinfen/NCC

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.

Appendix 6.

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.

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.

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.

Glossary

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 Impact Assessments: a process to protect the environment by ensuring that a local planning authority takes into account the environmental impacts of granting planning permission.

Environmental Land Management Scheme (ELMS): An agricultural policy for England that pays farmers for environmental benefits.

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.

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.

Inappropriate development: Construction or land use that is unsuitable for its location or conflicts with planning policies.

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.

Glossary

Landscape recovery schemes: Large-scale projects to support long-term environmental changes.

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.

National Character Areas (NCAs): England has 159 National Character Areas, each representing an area of distinct and recognisable character at the national scale. Their boundaries follow natural lines in the landscape, not county or district boundaries.

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 neutrality offsets: Measures taken to ensure that new developments do not increase nutrient pollution in sensitive areas.

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.

‘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: Possible actions that could be taken to achieve a specific goal.

Priorities: the outcomes which the strategy aims to achieve to benefit biodiversity

Glossary

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.

Sustainable agriculture: Farming practices that meet society's food needs while preserving the environment.

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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