Nidderdale National Landscape Nature Recovery Plan

Nidderdale
National
Landscape

September 2024

Contents

Executive Summary

This Nature Recovery Plan sets out how we will work together to enhance biodiversity across Nidderdale National Landscape (NNL). It was produced through consultation with the many different partners who have an interest in land management and conservation across the National Landscape, including farmers, land managers, government agencies and environmental NGOs.

Nidderdale National Landscape is already a special place for nature, home to a wide range of habitats and species. 40% of the National Landscape's area is recognised as priority habitat and 35% is designated through European (SAC/SPA), national (SSSI) or local (SINC) designations. Nevertheless, we recognise that – as is the case across Yorkshire and the rest of the UK – nature is, in general, declining and significant effort will be required to reverse this trend and help nature to recover.

The Plan follows the well-established Lawton Principles of "more, bigger, better and joined" to identify action across the four main habitat types of moorland, grassland, woodland and freshwater that are found in the National Landscape. We set out the shared vision for each habitat and the issues that need to be addressed, which leads to a narrative of how we will work together so that nature recovery can take place. Opportunity mapping, using the best currently available data, demonstrates in spatial terms where efforts should be focused to maximise enhancing existing habitat and new habitat creation.

Each of the four habitat plans has targets with milestones at 2030, 2040 and 2050 and example actions required across land management, knowledge building, partnership and finance and policy to help achieve these targets.

Moorland covers 41.7% (25,156 ha) of NNL. Targets in the Moorland Habitat Plan include:

- All peatland restored for nature and climate by 2040.
- 80% of moorland SSSI in good condition by 2040.
- 250 ha of new moorland mosaic habitat created by 2050.

Grassland covers 47.7% (28,735 ha) of NNL. Targets in the Grassland Habitat Plan include:

- 2500 ha of priority grassland habitat enhanced or restored by 2050.
- 75% of farm holdings adopting nature-friendly regenerative farming practices by 2040.
- 80% of farm holdings in agri-environment schemes by 2040.

Woodland covers 8.5% (5,131 ha) of NNL. Targets in the Woodland Habitat Plan include:

- 1875 ha of new native tree cover by 2050.
- 90% of existing woodland area in good management by 2040.
- 600 ha of plantation on ancient woodland restored by 2050.

Freshwater covers 1.2% (751 ha) of NNL. Targets in the Freshwater Habitat Plan include:

- 70% of water courses in good ecological status or potential by 2040.
- 75% of existing wetland habitat in good management by 2040.
- 750 new wetland habitat sites created or restored by 2050.

The Plan also identifies four key species where additional action over and above the habitat actions is required to safeguard and help their recovery. The species included are: adder, black grouse, curlew and waxcap fungi.

The Nature Recovery Plan can only succeed through continuing, strengthening and expanding the partnerships that exist between everyone who has an interest in land management and conservation in Nidderdale National Landscape. The many examples of positive action for nature conservation already taking place across Nidderdale National Landscape clearly shows the commitment of all partners to nature recovery. This Nature Recovery Plan will help us work together more effectively to accelerate our conservation work.

1. Nature in Nidderdale National Landscape

1.1 A Special Place for Wildlife

Nidderdale National Landscape covers 601km² in the foothills of the Pennines in North Yorkshire (Figure 1). The landscape bridges upland and lowland habitats and is full of contrasts and rich in wildlife. The scenery to the west is dominated by internationally important heather moorland. To the east, as the landscape broadens and flattens, is a softer, more pastoral landscape with areas of historic parkland. The major land uses are upland livestock farming, driven grouse shooting, forestry, recreation and the water industry. There are a wide range of habitats – moorland, grassland, woodland and trees, water and wetlands – that support a wide variety of wildlife. It is these varied habitats, the way they are managed and the species they support, that make Nidderdale National Landscape unique: a mix of habitats and species only found together in one place.

Figure 1: Nidderdale National Landscape's location.

The superficial geology of Nidderdale National Landscape is mixed, with areas of glacial till and peat with poor drainage. Generally, the landscape has acidic rocks and soils of low permeability with small pockets of more alkaline rocks and soils with higher pH. This geology is significantly different to the predominantly limestone geology of the adjacent Yorkshire Dales National Park. As a result, the National Landscape has quite different habitats – acid grasslands, acid woodland, different river ecology and significantly more ponds.

The National Landscape's moorlands are nationally and internationally important for wildlife. Diverse and species-rich mosaics of dwarf shrub vegetation interspersed with native broadleaved woodland in gills on the edges of the moors dominate the scenery, turning the moors purple in August. They support strategically important populations of birds including red grouse, merlin, and golden plover alongside other Red Listed birds such as curlew and lapwing that breed in the adjoining meadows and pastures. Their calls in spring dominate the landscape. Reptiles, including adder, slow worm and common lizard, are locally frequent, and there are still areas of flower-rich meadows on the grassland plateau alongside

fields that have been improved to produce silage crops. Species-rich grassland also occurs in areas formerly given over to lead mining where characteristic plants like spring sandwort and mountain pansy thrive. Ancient broadleaved woodlands dominated by oak, and carpeted with bluebells in spring, clothe the sides of the valleys, while alder forms extensive areas of wet woodland alongside river and streams. Otter numbers are increasing, while water voles are still present in some areas although in decline, and both brook and river lampreys are widespread.

1.1.1 Priority Habitat

Priority habitat[1] accounts for 40% (24,029 ha) of Nidderdale National Landscape. The most prominent habitats are upland heathland (which covers 22% of the National Landscape and accounts for 54% of priority habitat) and blanket bog (which covers almost 15% of the National Landscape and accounts for 35% of priority habitat). Deciduous woodland is also an important component, covering 4% of the National Landscape and making up 9% of priority habitat.

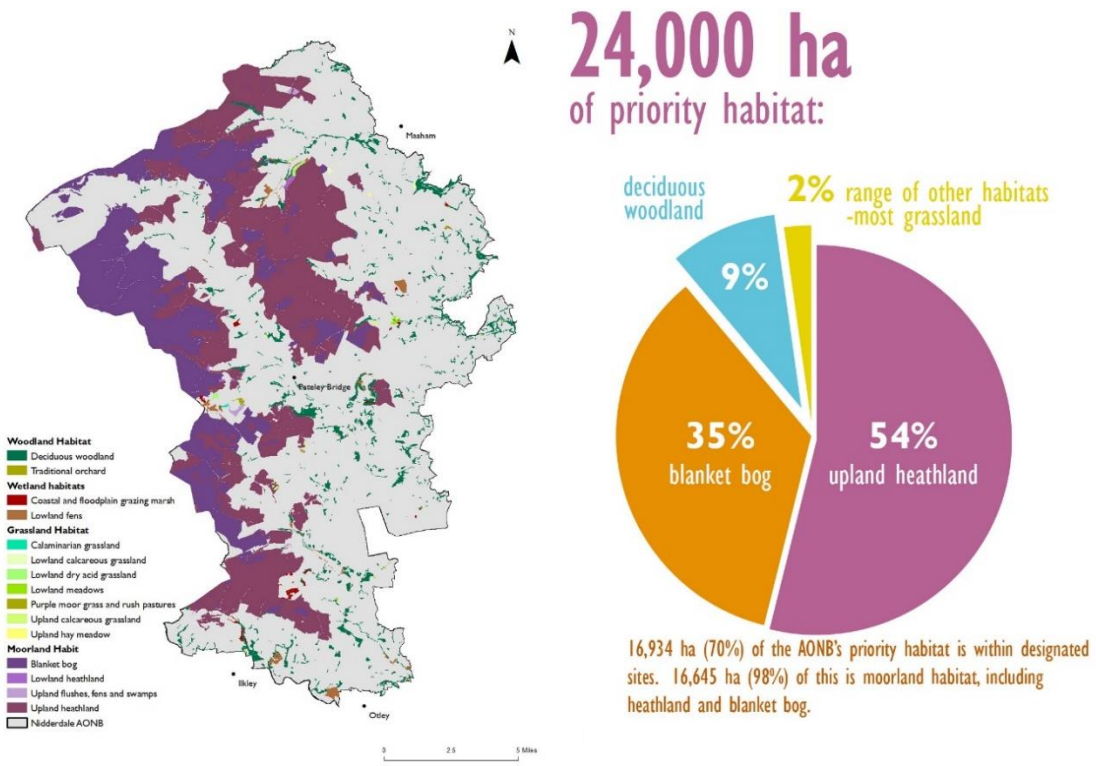


Figure 2: Priority habitat map and overview of priority habitat.

1.1.2 Designated Sites

Almost 35% of the National Landscape is covered by sites with European (SAC/SPA), national (SSSI) or local (SINC) designations. These offer valuable habitats to wildlife, with some level of protection, as well as natural spaces for people. 16,845ha of the Landscape (28%) is designated sites composed of moorland habitats (upland heaths and bogs).

[1] Priority habitats are semi-natural habitat types that were identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan.

West Nidderdale Moors Site of Special Scientific Interest (SSSI) and East Nidderdale Moors SSSI are large sites of international importance designated for their blanket bog and heather moorland communities and their moorland breeding birds including merlin, golden plover, snipe, curlew, redshank, short-eared owl, and peregrine.

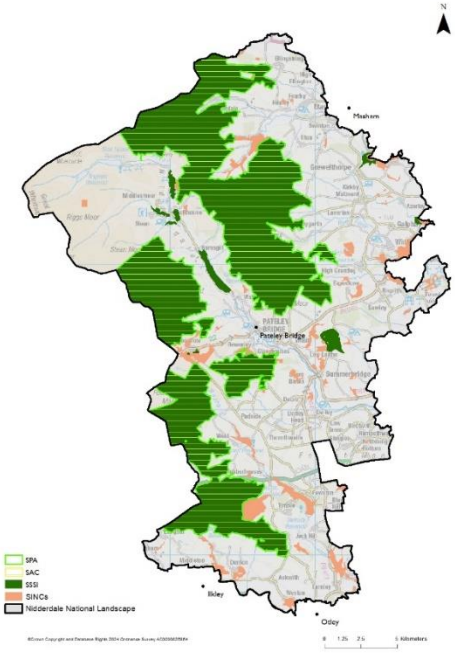


Figure 3: Designated sites in Nidderdale National Landscape.

Together they form part of the larger North Pennine Moors Special Protection Area (SPA) and the North Pennine Special Area of Conservation (SAC).

Key species for which the North Pennine Moors SPA is designated are golden plover, hen harrier, merlin (which all breed on moorland habitat) and peregrine (which tend to breed on inaccessible cliffs and rock faces).

The North Pennines SAC covers the same area as the SPA; key habitats for which the site is designated are dry heath, wet heath and blanket bog.

There are seven other SSSIs in the National Landscape, although two (Greenhow Quarry SSSI and Upper Nidderdale SSSI) are designated for their geology rather than wildlife.

The biological SSSIs are:

SSSI Name	Key habitats and species	Size (ha)
West Nidderdale Moors	Blanket bog, dry heath, upland flushes, acid grassland; moorland breeding bird populations including merlin, golden plover, snipe, curlew, redshank, teal and short-eared owl. Foraging peregrine, hen harrier and buzzard	13,418.9
East Nidderdale Moors	Blanket bog, dry heath, flushes, mires, acid grassland; merlin, peregrine, golden plover, short-eared owl, teal, red grouse, curlew, redshank and twite	10,777.0
Brimham Rocks (note also a geological SSSI)	Dry and wet heath, birch woodland and acid bog	162.7
Gouthwaite	Mudflats, marsh, open water, neutral grassland, and breeding wildfowl	147.7
Hackfall Wood	Ancient semi-natural broadleaved woodland and calcareous flushes	42.4
Cow Myers	Alder carr, reed bed and fen	15.2
Greenhow Pasture	Upland neutral grassland, calaminarian grassland	7.2

In North Yorkshire locally designated wildlife sites are called Sites of Importance for Nature Conservation (SINC) and their designation seeks to protect regionally important habitat from development. There are 83 SINCs in Nidderdale National Landscape and the key habitats covered are grassland, wetland and woodland. The total area of Nidderdale National Landscape designated as SINC is 2027 ha (3%).

1.2 The State of Nature

Nationally, there has been a continuous decline in nature for many decades, which has been meticulously tracked through the UK State of Nature reports (see https://stateofnature.org.uk/). These reports consider the whole of the UK – lowland and upland – and all land uses. The 2023 UK State of Nature report sets out the latest national data trends. Two important points made in the 2023 report are:

- The UK's nature is continuing to decline.
- We have never had a better understanding of the state of nature and what is needed to fix it.

This national trend is likely to be mirrored at a local level across the UK. However, while various datasets exist for different habitats and species in our local area, we do not have sufficient multi-year data to quantify trends at a Nidderdale National Landscape scale. Thanks to the recent work by Yorkshire Wildlife Trust and their partners to develop the *State of Yorkshire's Nature* study, there is analysis at a Yorkshire scale, and we can consider how many of these findings apply to Nidderdale National Landscape.

1.2.1 The State of Yorkshire's Nature Study Key Findings

The study identifies Yorkshire as a very important custodian for nature. Two thirds of all British biodiversity (estimated as between 40,000 and 50,000 species) is found here and Yorkshire may be a 'stronghold' for around 3,000 species, meaning that Yorkshire holds a disproportionately large population or range of these species. Over 200 of the plants, birds, moths and butterflies found in Yorkshire are classed as species of national conservation concern.

Despite this, Yorkshire has seen significant changes to its wildlife. Data shows that 17 plant species have not been recorded in Yorkshire in the period since 1970 and 130 moth species have not been seen since prior to 2000. The study extrapolates from known data to demonstrate that it is likely that nearly 2,000 species may have already disappeared from Yorkshire over the last 200 years. There have also been declines in the species still found in Yorkshire: 1 in 4 of Yorkshire's native plants have declined by at least 25% in distribution since 2000; 7% of macro moths have declined by at least 50% in the same period; and the breeding range of 35% of breeding birds declined between 1990 and 2010.

The study concludes that nature in Yorkshire is in a state of flux. While some species have increased and there have been some new arrivals, the species that are declining are nationally much rarer whereas the increasing species tend to be generalists and more common. This is leading to a large loss of diversity of animal and plant life in Yorkshire. The study notes the need for a broad range of well managed habitats, and the key role of wet and limestone habitats and the large biodiversity and environmental benefits that nature recovery in those areas will bring.

1.2.2 Local Context

Local knowledge and data for Nidderdale National Landscape supports the main findings of the State of Yorkshire's Nature study. As set out in Section 1.1, the National Landscape is a very important place for wildlife with a wide range of habitats that support many species. Although there are some positive changes, we can identify that many of our species and habitats are declining. Two examples help illustrate the changing picture for wildlife.

The Pennine uplands are considered a stronghold for Curlew, however recent studies funded through the Farming in Protected Landscapes programme at Darley Beck and Hartwith in Nidderdale National Landscape have demonstrated that the breeding success for Curlew nesting on farmland is extremely low and young birds are not replacing the aging adult population. Because Curlew have long lifespans

and return year-on-year to the same nesting areas the problem is easy to miss, but without urgent intervention these beautiful birds, whose calls are so much part of the local sense of place, face a cliff edge when the existing adults die and are not replaced by younger generations.

Species-rich hay meadows are also a characteristic feature of Nidderdale National Landscape. They support important grass and flower species, the combination of which provides a unique flora fingerprint for the area that is different to other upland landscapes. However, the number of meadows has reduced dramatically since World War II, replaced by pasture and silage, and only a fraction of the species-rich grasslands remains compared to 70 years ago. Within the remaining hay meadows, the flower and grass species diversity has declined, with many meadows supporting only common wildflower species. Rarer species survive only in our very best hay meadows. The loss of distinctive hay meadow flowers means we are losing what makes a Nidderdale meadow a unique part of the landscape.

2. Nature Recovery

2.1 Overview

To structure the nature recovery plan, we have divided our landscape into four broad categories based on their shared habitat and their location in our landscape: moorland, grassland, woodland and freshwater. Each habitat has an individual habitat plan, which contains:

- A list and description of habitats to provide clarity of what is meant by moorland, grassland, woodland and freshwater.
- A shared vision for each habitat which sets out our goals for nature recovery.
- A description of the current issues we need to address to help enable nature recovery in each habitat.
- Our 'story of nature recovery' for each habitat which provides a look into the future to show what nature recovery could achieve.
- A spatial mapping section showing where current habitat is located and opportunities for habitat enhancement and new habitat creation.
- A 'nature recovery overview' which provides targets and an action plan for each habitat.

These habitat plans will help us shape the actions, priorities and location of nature recovery work across the National Landscape. We also recognise that there are many crossovers between the four habitat categories, for example wet grassland is both a grassland and a freshwater habitat. Dividing the landscape into the four habitat categories provides a model that allows us to jointly agree issues, priorities and actions. While the reality on the ground may sometimes be more complex, the action plans allow us to understand where we can work together.

While the Nature Recovery Plan mainly focuses on the practical work needed for nature to recover in the National Landscape, the significance of the connection between people and nature is recognised. Maintaining and enhancing access to nature is extremely important for people's wellbeing and is part of the wider work of many partners involved with the Plan. Publicising this Plan and the progress of different strands of work that are being carried out to deliver it will also help people, both from the local community and visitors, to better understand, appreciate and support the area's special wildlife and the actions being taken.

2.1.1 Opportunity Mapping

We have created opportunity maps for heathland, grassland, woodland and freshwater habitat to help evaluate where in the National Landscape new habitat would have the most benefit at a landscape scale. These opportunity maps do not represent ambitions for new habitat creation but show areas where new habitat creation could provide above average benefits in the landscape should the landowner or land manager wish to pursue habitat creation or enhancement on that part of their landholding.

2.1.2 Principles of Nature Recovery

The 2010 Lawton Report, *Making Space for Nature*, set out recommendations to achieve a healthy natural environment which are widely accepted as key principles for nature recovery. This involves making spaces for nature that are "more, bigger, better and joined". The Lawton Report sets out five approaches:

i. Improve the quality of current sites by better habitat management.
ii. Increase the size of current wildlife sites.
iii. Enhance connections between, or join up, sites, either through physical corridors, or through 'stepping stones'.
iv. Create new sites.

v. Reduce the pressures on wildlife by improving the wider environment, including through buffering wildlife sites.

We have applied this framework to the Nidderdale National Landscape Nature Recovery Plan. When looking at opportunities for nature recovery the following principles have been used:

- Work at a landscape scale.
- Consider the environmental limits for habitat creation (not just current day boundaries).
- Existing 'core' habitats are a reservoir of biodiversity to build from.
- New habitat should not replace existing priority habitat (with limited exceptions).
- Food security is important, so avoid high-grade agricultural land for habitat change.
- Geological and heritage features need to be protected.
- Consider opportunities to buffer and connect existing habitat.

2.1.3 Nature conservation is already happening

There are many examples of where positive action for nature conservation is already taking place across Nidderdale National Landscape. These include:

- Farmers, land managers, gamekeepers and landowners restoring species-rich grassland; managing their land (often with support from agri-environment schemes) to benefit wading birds; changing their farming techniques to more regenerative techniques that reduce inputs and improve soil health; and participating in catchment sensitive farming; planting new woodlands and hedgerows; creating new ponds; managing ancient woodlands; and enabling and supporting peatland restoration.
- Conservation organisations delivering practical works such as peatland restoration; supporting farmers, land managers, gamekeepers and landowners with advice and funding for habitat creation and enhancement; and helping to shape nature conservation policies such as the Local Nature Recovery Strategy and catchment-scale planning.

This work clearly shows the commitment of all partners to nature recovery. There is a strong recognition that working with nature will also help to increase the resilience and diversity of farming and land management businesses. This Nature Recovery Plan will help us work together more effectively to accelerate our conservation work.

2.1.4 Links to the Environment Act and Local Nature Recovery Strategies

The Environment Act received royal assent in 2021 and operates as the UK's legal basis for environmental protection and enhancement following Brexit. The Act makes provision for the UK Government to set legally binding targets to restore natural habitats and increase biodiversity, as well as mandating Biodiversity Net Gain and the production of Local Nature Recovery Strategies. The Act: "establishes spatial mapping and planning tools to identify existing and potential habitat for wildlife and agrees local priorities for enhancing biodiversity in every area of England – Local Nature Recovery Strategies (LNRS)". The proposal is to expand, improve and connect areas of biodiversity throughout England, to build a resilient biodiverse landscape.

Local Nature Recovery Strategies (LNRS) are implemented by a "Responsible Authority", typically at county or combined authority level. Nidderdale National Landscape lies within the North Yorkshire and York LNRS and the Responsible Authority in this case is North Yorkshire Council. This Nature Recovery Plan has been produced to link to the LNRS and provide detailed information on the proposals for Nature Recovery within the boundaries of the National Landscape.

2.1.5 Setting targets

The four habitat action plans set targets for different aspects of habitat enhancement and creation. While these can only be indicative of the outcomes for nature that we all want to see, they will help us track our progress.

The actions and targets in this plan are for the whole landscape and all those involved in its conservation. They are not for any one organisation and will only be achieved if everyone involved helps in their delivery. They have been set to show what is needed to deliver nature recovery across the landscape and may in some cases exceed our current collective delivery capacity.

While the targets are locally determined, they are also influenced by the Defra *Protected Landscape Targets & Outcomes Framework*, in which Government has set out its expectations for the English Protected Landscapes (i.e., the 10 National Parks and 34 National Landscapes). Government has defined these targets as being:

- For the place, with all land managers and stakeholders supporting delivery.
- Focused on those goals in the Government's Environment Improvement Plan relevant to Protected Landscapes.
- National targets, with each individual Protected Landscape setting their own contribution supported by Natural England, to be embedded in management plans.

The Defra national targets that are relevant to nature recovery are:

Target 1:	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)
Target 2:	Bring 80% of Sites of Scientific Interest (SSSIs) within Protected Landscapes into favourable condition by 2042
Target 3:	60% of SSSIs within Protected Landscapes assessed as having 'actions on track' to achieve favourable condition by 31 January 2028
Target 4:	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
Target 5:	Ensuring at least 65% to 80% of land managers adopt nature friendly farming on at least 10% to 15% of their land by 2030
Target 6:	Reduce net greenhouse gas emissions in Protected Landscapes to net zero by at least 2050 relative to 1990 levels
Target 7:	Restore approximately 130,000 hectares of peat in Protected Landscapes by 2050
Target 8:	Increase tree canopy and woodland cover (combined) by 3% of total land area in Protected Landscapes by 2050 (from 2022 baseline)

The Nidderdale National Landscape partnership has an important role to play and this Nature Recovery Plan sets out how we can contribute to these national Protected Landscape targets. A separate monitoring framework will be developed to enable us to monitor change and see this progress towards the agreed targets.

2.2 Moorland Habitat Plan

2.2.1 Habitat Description

Habitats included are: blanket bog, dry and wet heath, grass heath, calaminarian grassland, upland flushes, gill woodland and scrub.

In the context of this plan, moorland habitat refers to the mix of habitats above the moorland line (above the limit of enclosed agricultural land). It includes blanket bog, dry and wet heath and upland acid grassland (known locally as grass heath). These main habitats are interspersed with wetter flushes and punctuated by gill woodland and scrub and there are scattered areas of calaminarian grassland. Moorland habitats provide valuable ecosystem services such as regulating water quality, mitigating flood risk and sequestering carbon.

Blanket bog is an exclusively rainfed peatland habitat, with variable peat depth and which can cloak whole landscapes including slopes. Typical species include heather, cross-leaved heath, deer grass, cotton grasses and Sphagnum mosses. Dry and wet heath surround the blanket bog and are characterised by dwarf-shrub species, with a greater dominance of heather on drier areas. Grass heath occurs at lower elevation, closing the gap between shrub dominated heath habitat and the enclosed (inbye) grassland. Grass heath is likely to have been more heather dominated in the past but has been modified through drainage and grazing. Where grass heath occurs on peat soils it is generally dominated by matt grass and heath rush, while on thinner, better drained soils this habitat is characterised by fescue and bent grasses and more wildflower species.

Upland flushes can be found within all moorland habitats and mark the point where groundwater reaches the surface as springs and gently flows across the soil to create wetter habitat. The water source can be acidic or can be more alkaline, and there are marked difference in plant species found in calcareous flushes compared to the surrounding acid habitats. Finally, the steep-sided gills cutting into the moors may contain heath, grass heath, bracken, scrub or broadleaf oak woodland. The scrub and

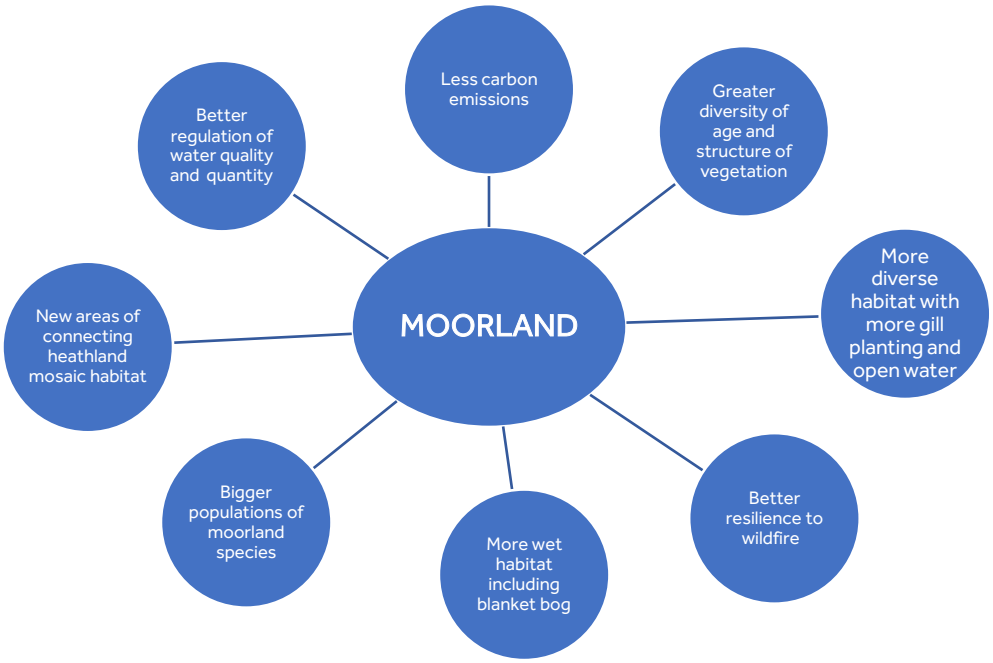
woodland found in gills are important as they provide winter shelter for moorland species. More open, south facing, slopes provide hibernation sites for reptile species.

Calaminarian grassland is a habitat of metal-rich soils that are a product of the National Landscape's industrial past – they occur on old slag heaps, where the soils are thin, nutrient poor, and concentrated with heavy metals, such as lead, copper, mercury and zinc. The heavy metals in the soil can only be tolerated by a small number of specialist plants, including rare species such as spring sandwort (also known as leadwort). In Nidderdale, calaminarian sites are predominantly found above the moorland line.

2.2.2 A shared vision

Our shared moorland vision that will guide nature recovery work in moorland habitats is that:

- Moorland habitats will generally be wetter, through wide-scale restoration of moorland hydrology. Restored higher water tables will lock in carbon, reduce wildfire risk and help to regulate water supplies during dry weather. There will be increased diversity and abundance of moorland species with, for example, increases in sphagnum mosses and sedges that thrive in wetter conditions.
- Strategically located areas of restored habitat will have been created to buffer and connect existing high-quality heathland and blanket bog habitat. This new habitat will be made up of small new areas of heathland, heathland mosaic (heathland patches, complemented by grassland and trees) or islands of stepping-stone habitat that links across longer distances. Similarly, within heathland habitats, restored areas of blanket bog habitat will connect areas of existing high-quality blanket bog habitat.



2.2.3 The issues we need to address to enable moorland nature recovery

- Organisations with an interest in moorland habitats can struggle to agree on specific issues such as how to assess habitat condition or predator control, as well as having difficulty more broadly in communicating effectively with each other - they lack an established 'meeting point' that can bring together all parties.

- Historical land management policies (e.g. gripping) continue to have a significant impact on moorlands and water quality across the wider landscape today.
- Moorland discussions can stall when trying to find a consensus on the best form of management, rather than placing the emphasis on working towards the outcomes of nature recovery.
- A lack of long-term biodiversity and climate research means that there are evidence gaps in the data needed to help with decision-making.
- Ensuring that we can safeguard rare and threatened species and prevent their persecution.
- The risk of wildfires is increasing due to climate change; where these occur, they will have significant impacts on species, habitats and people in the absence of targeted interventions such as the re-wetting of deep peat.
- Lack of information and awareness among the general public about the importance of moorlands in nature recovery and how they can help.

The complexity of moorland issues was recognised by participants at the nature recovery workshop. Typical comments included:

> *"There is not one habitat above the moorland line. There is not one management tool for the whole habitat."*
>
> *"Agree on what nature recovery looks like for moorland but need to recognise it is site specific."*

2.2.4 Our story of moorland nature recovery

Combining the shared vision and issues, we have developed a narrative of how we can work together so that nature recovery can take place across our moorlands. This is how the situation could look by the year 2050:

Discussions between moorland landowners, gamekeepers, farmers and conservationists, and increased research into current and new management techniques, helped deliver a broad agreement on what 'good condition' or 'high quality' means for our moorland habitats. We used this consensus to guide baseline surveys and mapping of our moorlands. We identified where our highest quality moorland habitats and deep peat areas were located, and we mapped where habitats were most degraded.

This baseline knowledge allowed us to understand the scale of the challenge and to pinpoint our resources to improve habitat condition where it was most needed and strategically plan new habitat. Work on improving moorland habitat condition initially concentrated on buffering and connecting areas of highest-quality moorland habitat so that priority locations for restoring heathland, blanket bog and grass heath habitat were identified next to habitat known to be in good condition. This immediately increased the resilience of high-quality habitat and also helped newly restored habitat to reach good condition quickly as species in existing good habitat could easily move into and benefit from restored habitat close by. This prioritisation process evolved as restoration work was completed and allowed us to gradually restore habitat condition across wide areas of moorland. These high quality moorland habitats link with similar areas to the north and west extending into the Yorkshire Dales National Park.

Strategic new moorland habitat was also created, beyond the moorland line, either as small areas of connecting heathland habitat, as moorland mosaic (heathland patches interspersed with grassland, freshwater and trees) or as stepping-stone habitat that provided islands that allow moorland species to move across longer distances.

The hydrology of moorland habitats was restored and water tables returned to natural levels to benefit moorland species and reduce wildfire risk. The carbon stores in all moorland habitats are now secure and carbon is now accumulating within all moorland soils. Restored moorland habitats are holding and regulating the water supply to our rivers to help mitigate climate change: dampening run off and reducing flooding when rainfall is high, leading to a significant reduction in sediment loss; and supplementing low flows when rainfall is low. We began the slow process of rewetting areas of deep peat and we have witnessed a gradual reversion in deep peat areas from drier shrub dominated heathland vegetation to sphagnum mosses and sedges which thrive in wetter conditions, moving habitat closer to that of blanket bog.

Overall, our moorland is more diverse: more gill woodland, more freshwater ponds and scrapes, more variation in the wetness of heathland and bog habitat, and an increase in grassland species richness. This diversity across the landscape is complimented by a deliberate increase in smaller scale diversity within habitats, with increased diversity in the age and structure of all moorland vegetation. This benefits species that need microscale diversity such as adder, slow worm and common lizard and provides more niches for the widest range of moorland species.

The move towards less intensively managed and more diverse moorland habitats has been adequately financed through payments for ecosystem services and nature recovery, paid through agri-environment schemes and through private investment. Positive changes to moorland condition take time, but the decline in our moorland species has been successfully halted. We have begun to increase the species richness of moorland vegetation and to increase the diversity of wildlife supported by moorland habitat. Appropriate predator control measures will remain one of the mechanisms available to support moorland nature recovery. The populations of vulnerable moorland species have stabilised and are increasing.

2.2.5 Where to focus our efforts now

Moorland nature recovery will focus on two distinct actions:

- enhancing the condition of all types of existing moorland habitat; and
- seeking to create small areas of strategically important new heathland, grassland, woodland and freshwater habitat.

The moorland opportunity maps show areas where habitat enhancement or creation could provide benefits in the landscape should the land manager of that site wish to pursue this approach on that part of their landholding. It is important to recognise these areas as opportunities.

Habitat enhancement

All available data on moorland habitat types and condition has been compiled to help plan habitat restoration (see Figure 4). This has resulted in one 'best estimate map' of moorland habitat which combines the knowledge gained from past local projects and national data. The map shows that there is over 25,000 ha of moorland habitat, apportioned as 5,914 ha of blanket bog (23%), 13,678 ha of heathland (54%) and 5,279 ha of grass heath/heath and grassland mosaic (21%) with at least 285 ha of flush habitat (1%).

Our knowledge of moorland condition, however, is poor. Having critically evaluated all the currently available data on habitat condition, it has been found to be too old, too fragmented, and not at a fine enough scale, to give us a robust baseline for habitat condition. Therefore one of our critical needs for moorland nature recovery is a robust and rapid survey methodology that will allow us to map the condition of our moorland habitat to tell us where our highest and lowest quality habitat is located. This will allow us to effectively and efficiently plan and monitor habitat restoration. In the meantime, efforts will be concentrated on peatland restoration that restores hydrology and revegetates areas of bare ground. Where blanket bog is being restored, we will prioritise unforested habitat but we will also look for opportunities for enlarging areas of blanket bog by removal of trees on peat guided by the national *Decision Support Framework for Peatland Protection*.

Habitat creation: strategic new habitat

One of our key goals for moorland is to ensure more diversity of habitat above the moorland line and so all four main habitats are shown on the opportunity map at Figure 5 to give an indication of where each new broad habitat could be created for maximum benefit. The map shows above average opportunity for habitat creation[2] located above and just below the moorland line. Heathland opportunity was derived by scoring factors that such as peat depth, proximity to existing habitat and potential connections to existing habitat. The methodology for the other broad habitats is described separately in the other habitat sections.

Above average opportunity for heathland creation covers 2,634 ha and this is widely distributed around the edge of existing heathland habitat. Much of the opportunity is concentrated above the moorland line, but some opportunity extends beyond the moorland line where there is the potential to create new connections between blocks of heathland habitat. Above the moorland line there is also above average opportunity for woodland across 235 ha, grassland across 515 ha and freshwater across 2864 ha.

[2]Opportunity is scored across the national landscape from low to high. We have chosen to illustrate this opportunity by showing above average scores. However, the threshold for evaluating opportunity can be set lower or higher to show more dispersed opportunity or more prioritised opportunity.

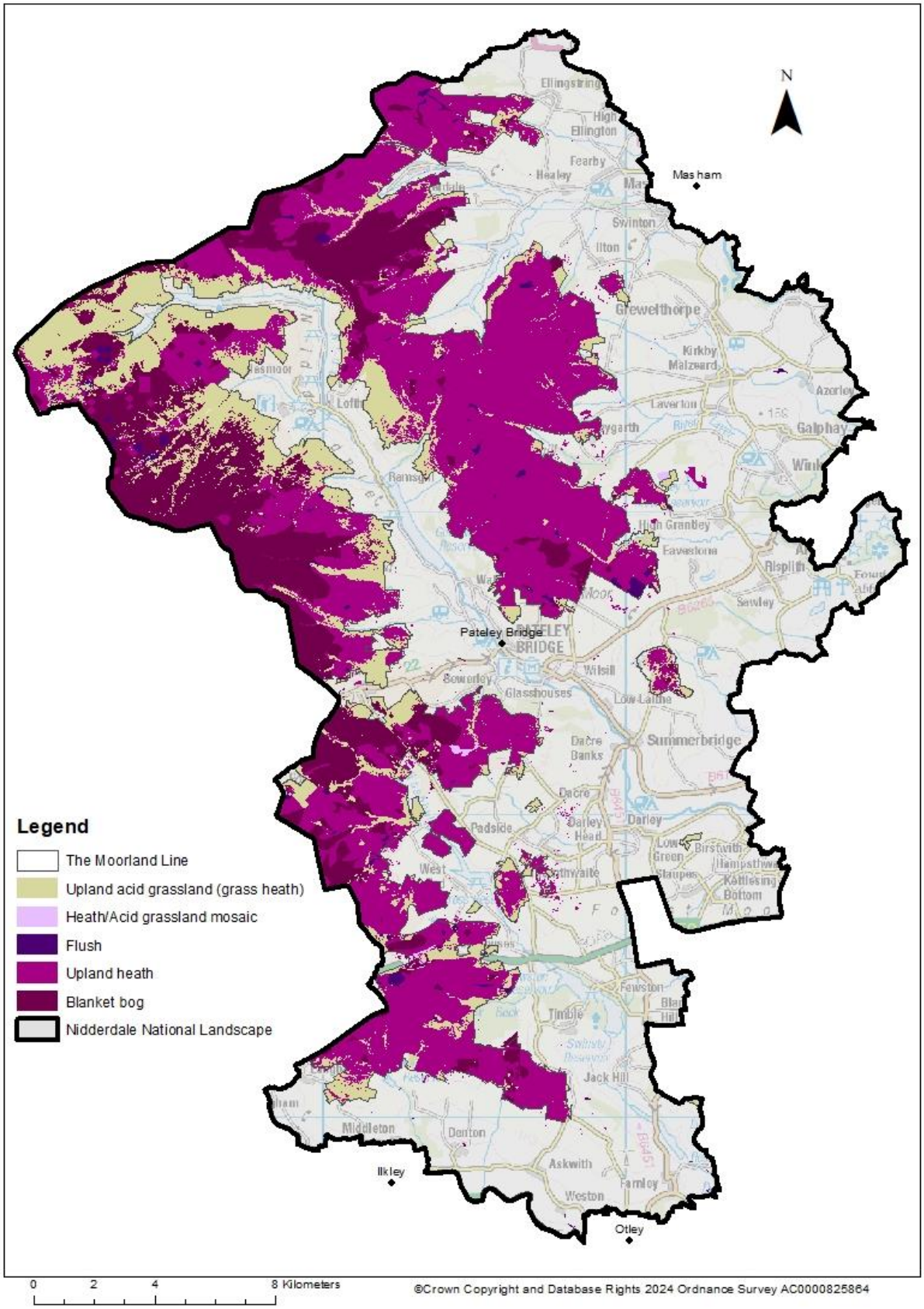


Figure 4: A best estimate map of moorland habitat across Nidderdale National Landscape.

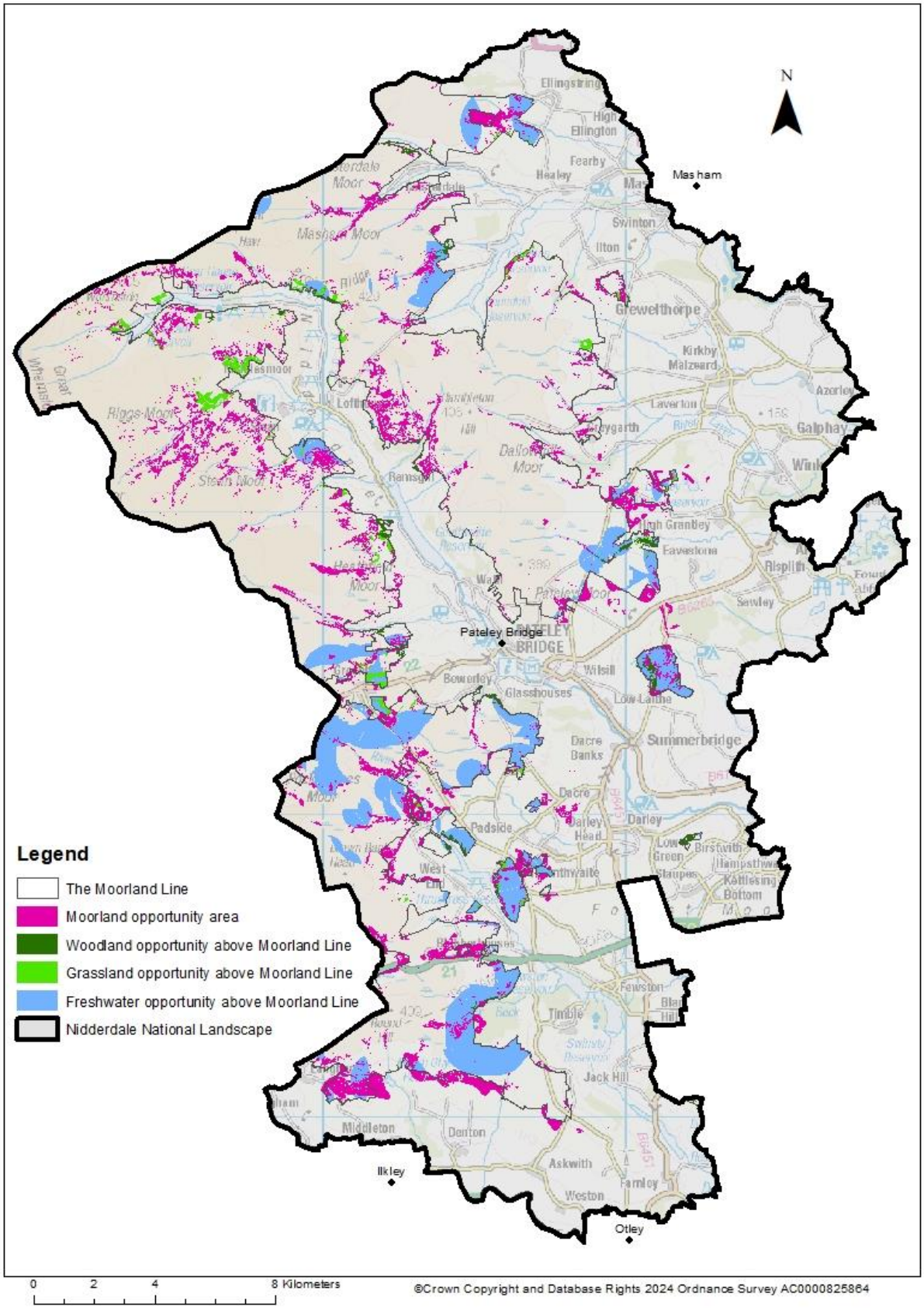


Figure 5: Above average opportunity for heathland, grassland, woodland and freshwater above the moorland line.

Moorland Nature Recovery Overview

In NNL, moorland covers: 41.7% (25,156 ha)

Definition: All habitats above the moorland line: blanket bog, dry and wet heath, upland flushes and grass heath, plus associated areas of gill woodland and scrub

Vision:

- Less carbon emissions
- Better resilience to wildfire
- More new connected moorland mosaic habitat
- Greater diversity of age and types of vegetation
- More wet habitat including blanket bog
- Better water quality and quantity regulation
- More diverse habitat with more gill planting and open water
- Bigger populations of moorland species

Targets:

By 2030	By 2040	By 2050
• 80% (16,130 ha) of peatland restored for nature and climate • 80% of moorland SSSI on track to achieve good condition • 50 ha of new moorland mosaic habitat created • 70% of moorland in agri-environment schemes	• 100% (20,162 ha) of peatland restored for nature and climate • 80% of moorland SSSI in good condition • A further 100 ha of new moorland mosaic habitat created • 80% of moorland in agri-environment schemes	• All peatland maintained for nature and climate • All moorland SSSI in good condition • A further 100 ha of new moorland mosaic habitat created

Action Plan:

Land Management Actions	Knowledge Building Actions	Partnership Actions	Finance & Policy Actions
• Continue programme of peatland restoration to restore hydrology and revegetate bare peat • Deliver a programme of targeted new moorland mosaic habitat creation • Enhance existing moorland habitats to increase diversity of vegetation	• Complete condition survey of moorlands to help target habitat enhancements • Estimate annual moorland greenhouse gas emissions • Baseline moorland SSSI condition	• Create and sustain a NNL Moorland Forum to build trust and develop consensus on moorland management • Ensure estate wildfire plans are in place and maintain the Wildfire Group • Educate public to reduce fire risk; and to reduce disturbance to wading birds from dogs	• Advocate for appropriate funding to continue to deliver peatland restoration • Seek non-governmental funding to expand and accelerate moorland habitat delivery • Use findings from NNL Moorland Forum to influence national policy

2.3 Grassland Habitat Plan

2.3.1 Habitat Description

Habitats included are: hay meadows, purple moor grass and rush pasture, lowland acid grassland, calcareous grassland, rough grassland, floodplain meadows and marshy grassland, productive pasture and silage fields and waxcap grassland.


Grassland habitat © Leanne Fox/NNL

Grassland habitats make up half of Nidderdale National Landscape's land cover. The individual grassland habitats are primarily a product of management and range from rough tussocky grassland that is seldom grazed, and never cut, through to intensive silage fields where grass is cut repeatedly over short intervals and improved pasture which is intensively grazed by livestock. In between are hay meadows which are lightly grazed from late summer though to early spring and then 'shut up' for late spring and summer to allow the grass to grow long and the wildflowers to flower and seed. Hay meadows are cut only once in summer. Purple moor grass and rush pasture are also less intensively farmed, with lower levels and frequency of grazing. Dry stone walls form the field boundaries in many parts of the National Landscape and are themselves important wildlife features, providing nesting habitat for bird species, refugia or hibernaculum for reptiles and amphibians, as well as being a lichen rich habitat.

The intensively farmed silage fields and pasture are dominated by agricultural grasses and cultivars, especially rye grass. Less intensively farmed fields are a mix of native grasses (generally characteristic of mesotrophic (or neutral) grassland) such as: crested dog's tail, sweet vernal grass, red fescue and common bent. There are small areas of lowland acid grassland dotted throughout the landscape and calcareous grassland is found in small parcels mainly on carboniferous limestone in the northwest, and on magnesian limestone in the northeast of the National Landscape. This includes small areas of upland meadow habitat in Upper Nidderdale.

Also of note are 'ancient' grasslands, characterised by the presence of a number of colourful 'waxcap' fungi. Waxcaps are very sensitive to disturbance and to changes in soil fertility, so they are easily lost

after ploughing or use of artificial fertiliser. Fields with a mix of waxcap species are likely to have been relatively undisturbed for hundreds of years and remain unploughed and unfertilised. Fields that support waxcaps are often, though not exclusively, wildflower rich.

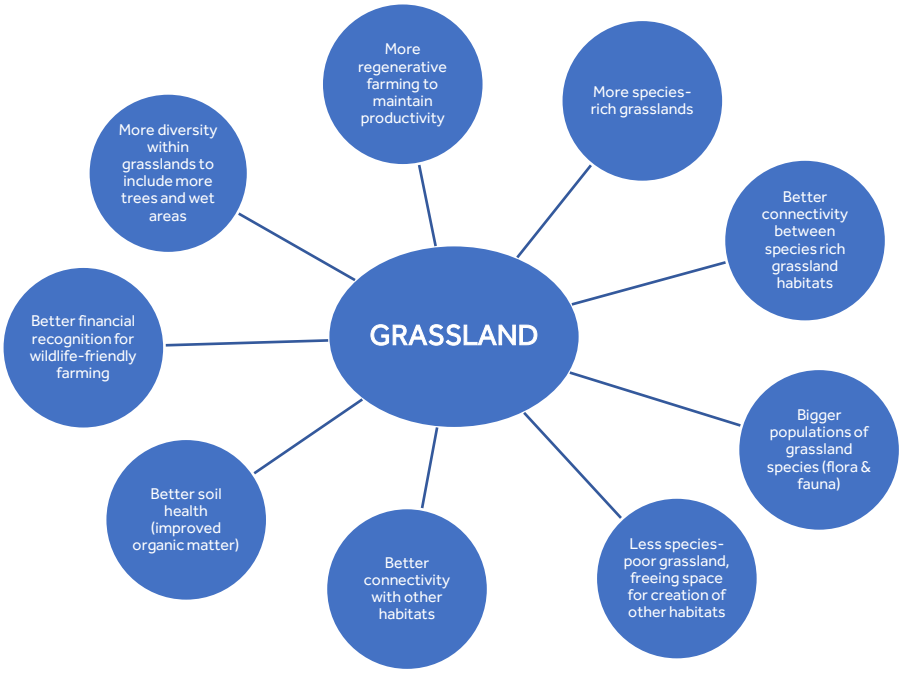
Where conditions are wet, grassland can grade into freshwater habitat: close to steams in floodplain meadows for example or where drainage is impeded. Our grasslands have been widely drained to improve the land for agriculture and many wet grassland habitats have been lost.

Above the moorland line, and considered within moorland habitats in this nature recovery plan, are upland acid grassland (grass heath) and calaminarian grassland.

2.3.2 A shared vision

Our shared grassland vision that will guide nature recovery work in grassland habitats is that:

- Wildflower-rich and fungi-rich grasslands are protected as irreplaceable habitat and are at the centre of a network of diverse semi-natural grasslands managed for nature through support for farmers delivering nature-friendly farming. This network supports an increased diversity and abundance of grassland species, from wildflowers and grasses to pollinator insects, wading birds and owls. It links with adjacent freshwater habitat to provide excellent foraging habitat for freshwater amphibians.
- Productive grasslands provide high quality food, climate resilience and biodiversity enhancements through the adoption of regenerative agriculture techniques that improve soil health leading to increased productivity. Small-scale changes around productive grassland management are leading to increased fledging success for wading birds, increased hedgerow connectivity and reduced artificial inputs.
- Strategic areas of species-poor grassland have been restored to new woodland (including expanded areas of wood pasture), freshwater and moorland habitat. The reduction in grassland area will be compensated for by anticipated uplifts in grassland productivity provided by regenerative farming techniques, allowing similar numbers of livestock to be kept on less land without loss of yield.



2.3.3 The issues we need to address to enable grassland nature recovery

- Shifting from profitable productive grasslands to grassland managed with more focus on nature conservation can potentially have a negative financial impact for farmers.
- Understanding opportunities from agri-environment schemes requires targeted and specialist advice from skilled local advisors.
- Existing species rich grassland habitats are not well-connected.
- Poorly managed and / or damaged grassland soils increase the risk of soil erosion, which leads to increased sediment and nutrients in rivers as well as degradation of source grassland.
- Management techniques such as regenerative agriculture that improve soil health and biodiversity are not well-known and currently have low levels of uptake.
- There is a perception that livestock farming for food production is not compatible with wildlife-friendly farming.

2.3.4 Our story of grassland nature recovery

Combining the shared vision and issues, we have developed a narrative of how we can work together so that nature recovery can take place across our grasslands. This is how the situation could look by the year 2050:

We have systematically surveyed and mapped our grassland habitat. We have identified where grassland biodiversity is highest and where our food production is centred. Farmers can earn a sustainable income through both nature recovery and food production.

Our wildflower rich and ancient fungi-rich grasslands are protected for the long term as irreplaceable habitat. These exceptional grasslands are at the centre of new, much larger patches of core grassland habitat managed for nature recovery. The core grassland areas contain a diverse range of grassland habitats, and a range of grassland management, supporting as many grassland species as possible. These grassland areas nevertheless remain part of food production through conservation grazing under nature-friendly farming management.

Our core grassland areas are interconnected. Species movement is facilitated by stepping-stone and corridor habitat right across the landscape forming a coherent network of grassland habitat, interspersed with increased woodland cover, high quality heathland and more productive grassland that is more focused towards food production. Our core grassland habitat supports elements of wet grassland and often blends seamlessly towards freshwater habitat, supporting excellent foraging habitat for freshwater amphibians.

The overall extent of grassland habitat in the National Landscape has reduced by about 4%, as areas of species poor grassland habitat have been transformed to support new woodland, freshwater and moorland habitat, with care taken to avoid negative impacts on existing grassland species, for example wading birds. This small reduction in habitat coverage has been compensated for by a widespread increase in grassland condition. Grassland restoration has returned species poor grassland to more diverse grassland habitat, and grassland species, including pollinator insects, are thriving. The suite of restored grassland habitat has been broad: increasing the extent of our wildflower rich meadows but also recognising the importance of vegetation structure to support grassland species such as wading birds and barn owls.

Silage fields and more productive pasture remain part of our grassland habitat. Regenerative agriculture techniques, such as rotational grazing, have increased soil health whilst maintaining grassland productivity. There is greater infiltration of rainwater into our grassland soils, providing natural flood management that means less overland flow and less flooding of local communities. The increase in grassland productivity, achieved sustainably through rotational grazing, means that similar numbers of livestock can be kept on smaller areas of land, freeing areas of grassland for nature recovery without loss of yield. Payments for the ecological services provided by grassland help provide a sustainable income for farmers. In silage fields, small changes have helped towards nature recovery. This has meant altering the timing of management to avoid impact on vulnerable species such as curlew at critical time periods and changes to grassland composition: small changes such as adding white clover, or wholesale change with conversion to herbal leys, to benefit pollinators and reduce fertiliser inputs.

The hedgerows and rough grassland that edge productive grassland fields have been extended, are well connected and are managed for wildlife and our drystone walls are protected and well-maintained. This facilitates movement of species through productive land and helps to sustain species that live in semi-natural habitat close to our productive grasslands. Fewer artificial inputs, improved soil health and grassland buffer strips have increased the biodiversity value of productive grassland soils and have reduced pollution in our freshwater habitat.

2.3.5 Where to focus our efforts now

Grassland covers large areas of the National Landscape. Much of our grassland is species poor and in some areas this grassland has been created relatively recently by degrading or removing other habitats – by grazing heathland, clearing trees and draining wetlands. The goal of nature recovery in Nidderdale National Landscape will not be to create new grassland habitat, only to enhance and restore existing grassland habitat. The overall coverage of grassland will decrease slightly as some species-poor grassland is converted to new woodland, heathland and freshwater habitat.

The grassland opportunity maps show areas where habitat enhancement or creation could provide benefits in the landscape should the land manager of that site wish to pursue this approach on that part of their landholding. It is important to recognise these areas as opportunities.

Habitat condition: restoration and enhancement of habitats

The 'best estimate' map for grassland habitat in the National Landscape shows the first robust assessment of the coverage of grassland habitat (Figure 6). The map shows that grassland habitat covers 28,735 ha below the moorland line, which is 48% of the National Landscape. The extent and importance of grassland habitat is often overlooked, so placing an overall figure on grassland extent for the first time allows an evaluation of grassland habitat extent alongside other broad habitats.

The task of restoring grassland habitat is significant, as only 3% of our grassland habitat below the moorland line is known to be priority grassland[3] (see Figure 6). A 'grassland ladder' is a useful concept to guide grassland restoration. This is a sliding scale of species richness and biodiversity value, with intensively managed silage fields and improved pasture at the bottom of the ladder and species rich priority grassland habitat at the top of the ladder. The aim is to move grassland habitat as far up this ladder as possible through management changes. In some locations there will only be small adjustments at the top and bottom of the ladder, whereas elsewhere there might be big changes from the middle rungs of the ladder right to the top.

To guide these efforts, we aim for the biggest changes to grassland condition to be focused in grassland opportunity areas (see Figure 7). These opportunities are based on proximity to and connections between existing priority grassland and we aim to grow and connect existing clusters of species rich grassland. Existing patches of species rich grassland are small and separated by substantial distances and, as a consequence, the habitat opportunity mapping suggests small scale buffers to existing habitat and small-scale connections as the short-term priorities for grassland nature recovery. Longer distance connections between existing core grassland are also needed and will require planning for multiple coordinated stepping-stone habitats to connect core grasslands to each other and to other habitats.

There are strategic grassland connections between Nidderdale National Landscape and species rich grassland to the eastern edge of Yorkshire Dales National Park. Connecting this large area of priority grassland in the National Park directly to grassland habitat in the National Landscape is only possible at three locations: at the head of the Nidd catchment, at Greenhow and at lower elevation in the Wharfe Valley. We intend to develop the central Greenhow connection as a priority location from which to grow and expand priority grassland.

[3] Priority habitats are a range of semi-natural habitat types that were identified as being the most threatened and requiring conservation action in the UK Biodiversity Action Plan. Our assessment of 'priority' grassland includes good quality grassland habitat not yet mapped on the Priority Habitat Inventory.

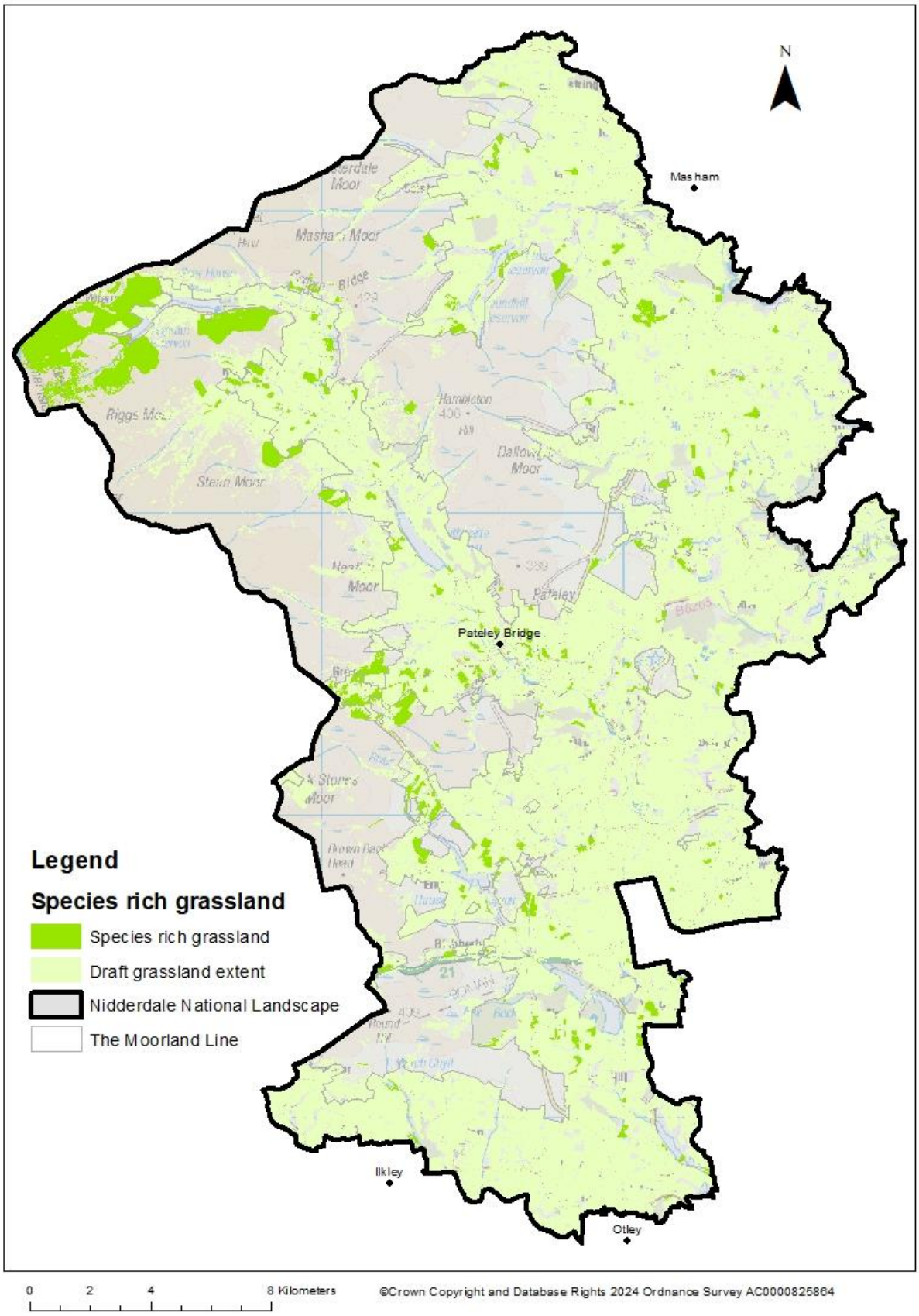


Figure 6: A best estimate map of grassland extent in Nidderdale National Landscape.

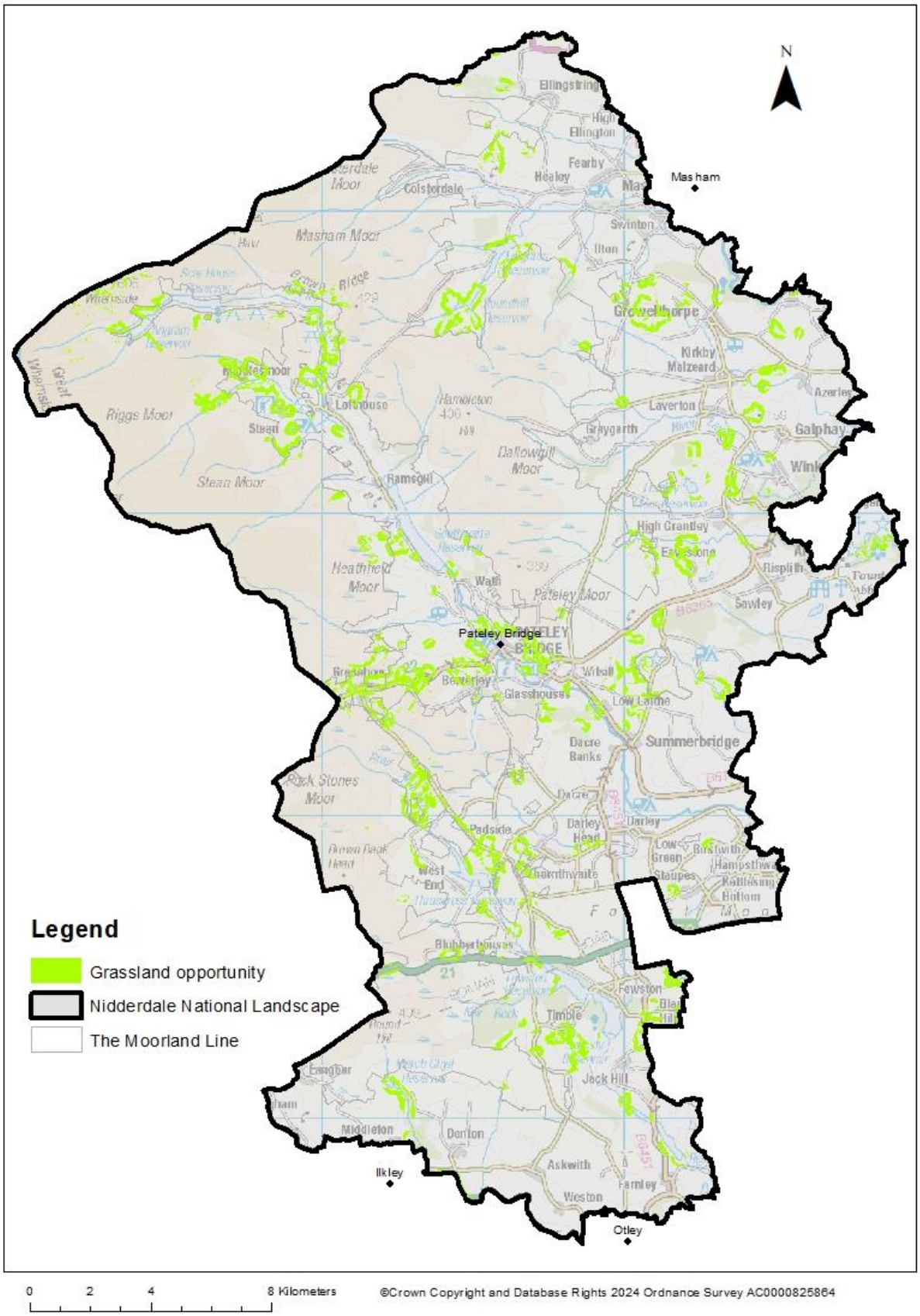


Figure 7: Opportunity areas for species-rich grassland habitat enhancements.

Grassland Nature Recovery Overview

In NNL, grassland covers: 47.7% (28,735 ha)

Definition: Grass heath, hay meadows, rough pasture, rush pasture, rough grassland, productive pasture and silage fields

Vision:

- More regenerative farming to maintain productivity
- Bigger populations of grassland species (flora & fauna)
- Better soil health (improved organic matter)
- More species-rich grasslands
- Less species-poor grassland, allowing other habitat creation
- Better financial recognition for wildlife-friendly farming
- Better connectivity between species rich grassland habitats
- Better connectivity with other habitats
- More diversity in grasslands to include more trees and wet areas

Targets:

By 2030	By 2040	By 2050
• Enhance or restore 500 ha of priority grassland habitat • 25% of farm holdings adopting nature-friendly regenerative farming practices • 70% of farm holdings in agri-environment schemes	• Enhance or restore a further 1000 ha of priority grassland habitat • 75% of farm holdings adopting nature-friendly regenerative farming practices • 80% of farm holdings in agri-environment schemes	• Enhance or restore a further 1000 ha of priority grassland habitat • 90% of farm holdings adopting nature-friendly regenerative farming practices

Action Plan:

Land Management Actions	Knowledge Building Actions	Partnership Actions	Finance & Policy Actions
• Deliver a shift to nature-friendly regenerative farming practices • Deliver a long-term priority grassland habitat restoration programme • Convert suitable productive improved species-poor grasslands to well-managed herbal leys	• Undertake a NNL-wide grassland survey to help prioritise conservation action • Guidance on how to deliver wader conservation within a regen agriculture system • Research climate mitigation impacts of a shift to a regen agriculture system	• Develop peer-to-peer and mentoring support for farmers • Expand Curlew recovery projects and integrate with other priority wading bird species • Provide tailored advice to farmers and land managers on agri-environment schemes • Promote good practice by farmers to raise awareness with public	• Advocate for ELM options to support wading bird management • Advocate for ELM payment rates that support farmers to deliver long-term conservation • Develop case studies to show financial impact of a shift to a regen agriculture system • Advocate for more people resource to deliver local trusted advice

2.4 Woodland Habitat Plan

2.4.1 Habitat Description

Habitats included are: ancient woodland, long-established broadleaf woodland, more recently planted broad-leaf woodland, conifer woodland, mixed woodland, wet woodland, scrub, wood pasture, orchards, hedgerows, veteran trees and trees outside woodland.


Woodland habitat © David Tolcher

Ancient woodland sites are locations which have been continuously wooded since 1600. Woodland on these sites may have been felled in the past but woodland was allowed to regenerate immediately after felling or the site was immediately replanted. Continuous woodland cover means these sites have undisturbed soils that retain the ancient fungal network and woodland flora in the soil. Ancient woodland sites often contain species not found in more recently planted woodland, including ancient woodland 'indicator plants' such as wood anemone, cow wheat, woodruff and sanicle. Where ancient woodland sites have broadleaf native woodland cover they are called 'semi-natural ancient woodland', whereas sites where conifers have been planted are called 'plantation on ancient woodland sites'.

The rest of the woodland sites in the National Landscape are more recent. Some of our woodland is 'long established woodland' which has been continuously wooded since 1830, but most have been planted more recently, including large areas of conifer woodland, many of which were planted between the 1940s and 1960s and are now approaching harvestable age. Many of our woodlands are mixed, with areas of native broadleaf trees and conifer trees.

Our planted native woodlands are dominated by oak, sycamore and ash. Native woodlands can have wet and dry areas, each supporting different tree species and ground flora. Wet woodland is dominated by trees such as alder and willow and support more mosses and ferns.

Conifer woodlands are productive woodlands planted so that the trees can be harvested. In Nidderdale conifer woodland is dominated by Corsican, Scots pine, Norway spruce, Sitka spruce and larch species.

Conifers are faster growing than native species, have denser canopies and are closely planted, which means the light reaching the floor of conifer woodlands is much less than the light available in native woodland and so the ground flora is generally species poor.

At the edge of woodland is transitional scrub habitat. This is developing woodland habitat dominated by pioneer and understorey trees, such as silver birch and hawthorn, and over time this will progress towards native woodland.

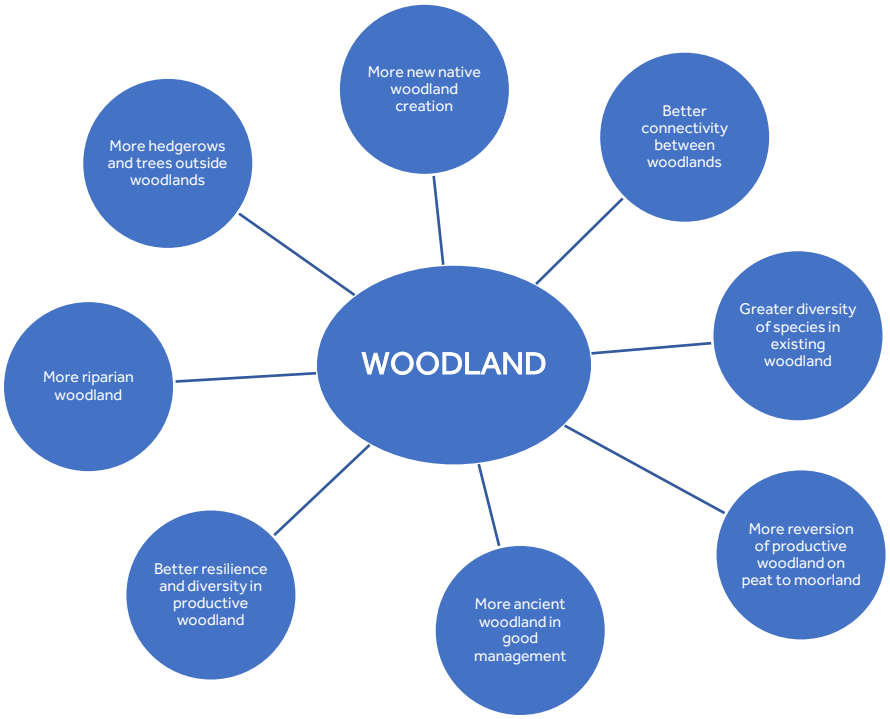
Between woodlands, linear plantations of trees form a hedgerow network that has been developed to divide up grassland to manage livestock. In the National Landscape hedgerows are found mostly in the valleys and to the east since further west, and at higher elevations, stone walls dominate. The hedgerow network provides important habitat for woodland animals and provides safe shelter for animals to travel across the landscape between woodland habitats. Riparian woodland provides similar linear features along many watercourses.

Wood pasture and orchards have sparsely planted trees over a grassland ground layer. They can provide permanent habitat for woodland species and are good 'stepping-stone' woodland habitats, providing resting and feeding places for woodland species undertaking longer journeys. Orchards and wood pasture can also contribute as grassland habitats, supporting grassland species. 'Trees outside woodland' refers to individual trees within fields and standard trees within hedgerows. This range of woodland habitats provide many ecosystem services, particularly for carbon sequestration and water management.

2.4.2 A shared vision

Our shared woodland vision that will guide nature recovery work in woodland habitats is that:

- Tree cover has increased through carefully targeted woodland creation that links and expands the existing woodland network, creating a range of different sized woodlands in the valleys and small gill woodlands on the moorland edges. New trees accumulate carbon to help climate mitigation and woodlands provide climate adaptation through natural flood management and, in riparian zones, river shading to cool rivers during high temperatures. The locations for woodland creation consider other habitats and species, particularly constraints around breeding wading birds and peat soils.
- Existing and new woodlands are well-managed, creating a network centred on ancient woodlands. These diverse woodland habitats include understorey trees and woodland ground flora and supports a wide range of woodland wildlife.
- Productive woodlands are a mix of conifer and broadleaf species to provide resilience against climate change and disease. They are managed through practices such as continuous cover forestry to enable timber harvesting while maintaining tree cover. Older productive woodlands that were planted on deep peat have been harvested and reverted to moorland habitat.
- Tree cover outside woodland provides further connections across the landscape through increased hedgerows and expanded wood pasture, which also creates our future veteran trees.



2.4.3 The issues we need to address to enable woodland nature recovery

- Ensuring that the 'right tree' is planted in the 'right place', so that woodland creation does not have adverse impacts (for example, avoiding planting on deep peat soils and in areas suitable for wading birds).
- Tree planting does not currently provide an obvious financial benefit for landowners, which can hold landowners back from the long-term shift to converting their land to woodland.
- The purpose and/or wider benefits of woodland are not always clear to farmers and land managers, which can make woodland seem not relevant to the day-to-day operations of a working farm.
- Deer management is required to address the potential impact of deer on existing and new (planted or naturally colonised) trees.
- There are significant amounts of bureaucracy to navigate to be able to create new woodland.
- Woodland creation is a very long-term land-use change.
- Increasing tree health issues, for example ash die back and Phytophthora Ramorum, which will impact at both a local woodland level and across the wider landscape, and the need for more resilient woodlands.
- The difficulties that can be experienced by small woodland owners in being able to attract contractors and support marketing of timber to make it economically viable.

2.4.4 Our story of woodland nature recovery

Combining the shared vision and issues, we have developed a narrative of how we can work together so that nature recovery can take place across our woodlands. This is how the situation could look by the year 2050:

We have surveyed woodland habitat across our landscape. We know where our ancient, long-established and species rich woodland is located. These high value woodlands are under sustainable management, funded primarily for nature conservation, and have been buffered, extended and connected by new woodland planting. Management of these woodlands has seen an improvement in habitat condition, including the development of diverse understorey trees and an increase in the coverage and diversity of woodland ground flora. As existing woodland habitats have become more diverse, woodland wildlife has flourished and this has created the potential for species reintroductions such as hazel dormice and for red squirrels to move into the area from the west.

New native woodlands are as diverse as possible: established from targeted planting or through natural regeneration and including both large woodlands in the valleys and small gill woodlands within moorland habitat. New woodland planting incorporates wetter and drier areas to allow for the widest range of woodland species in the future. Broadleaf planted woodland, that has had time to establish, has been enhanced by the arrival of species from older woodlands that they are now connected to, and through the deliberate addition of local seed and the translocation of soils. We have sited new freshwater habitat within and close to our older broadleaf woodland habitat, supporting foraging amphibian species by providing breeding habitat close to good woodland foraging habitat. Thanks to the availability of new native woodland habitat, and better managed existing habitat, woodland species have increased in diversity and abundance. These benefits extend beyond the National Landscape where there is connectivity into other woodlands to the south and east.

New productive woodland has been established that are a mix of conifer and broadleaf planting allowing sustainable harvesting that preserves a broadleaf basis for the woodland to protect the woodland understorey and woodland species, while allowing selective harvesting of faster growing conifer trees. Productive woodland that had previously been established upon high value habitat, such as deep peat, has been gradually restored to moorland habitat. This restored habitat has remnant moorland species and shows promising signs of habitat recovery and reduced carbon emissions as the peat soils become gradually wetter.

The young trees in our new woodlands grow at a fast rate, accumulating carbon. Our new and older planted woodlands are managed to maximise carbon capture in the trees, understory and soils, and new woodland is sited to provide not just nature recovery but climate mitigation and adaptation: storing more carbon, intercepting rainfall, slowing runoff and filtering water flow to our rivers. Shading our rivers through riparian tree planting has helped mitigate the warming impact of climate change on our rivers.

Our hedgerow network has also been expanded, providing linear connections between woodlands across the landscape. These hedgerows are allowed to flower, produce fruits and provide food. Areas of wood pasture and orchard have also increased and these woodland habitats are underpinned by species rich grassland. Veteran trees are recorded and protected and we have planted new trees outside woodland which will become the new veteran trees of the future.

2.4.5 Where to focus our efforts now

Woodland cover in Nidderdale National Landscape is 8.5%, below the current national average of 10.2%. Expanding woodland cover in Nidderdale must be part of nature recovery to provide new woodland habitat, connect and buffer existing woodland habitat and to help sequester carbon to mitigate against climate change. However, there are significant constraints to woodland planting so woodland planting targets are modest. We want to balance modest woodland creation targets by siting our new woodlands effectively to provide the highest possible benefit and we want to raise the quality of our existing woodland, both ancient and more recently planted.

The woodland opportunity maps show areas where habitat enhancement or creation could provide benefits in the landscape should the land manager of that site wish to pursue this approach on that part of their landholding. It is important to recognise these areas as opportunities.

Habitat condition: restoration and enhancement of habitats

A woodland habitat map for Nidderdale National Landscape, which adds local partner data and commercial data to national Forestry Commission mapping, provides a more complete local picture of our woodlands, particularly smaller woodlands (see Figure 8). There is ongoing work to update the ancient woodland inventory, which will also provide improved information for long established woodland. Very little is known about the condition[4] or quality of our woodland and a widespread survey of woodland condition would help us to strategically plan for nature recovery at a landscape scale. A woodland condition toolkit developed by the Forestry Commission and partners will help with this condition assessment work.

Until a detailed woodland condition survey is completed, we plan to use woodland age as a proxy for higher quality woodland to guide efforts, with ancient woodland and long-established woodland sites prioritised for woodland management actions. Knowing where our ancient, long established and species rich woodland is located will help us to pinpoint sites that need protection through sustainable management. We can also enhance these sites with new tree planting close by to ensure there is habitat for species to expand and move into it. This will help shift species in these small ancient woodlands from a steady state, or a state of decline, to one of expansion and growth.

Habitat creation: strategic new habitat

Figure 9 shows the woodland opportunity plan for Nidderdale National Landscape. This prioritises locations for new woodland that are close to existing habitat, connect existing woodland and sites that provide ecosystems services such as slowing and filtering run off and shading rivers. The woodland opportunity also avoids known woodland planting constraints such as existing priority habitat and wading birds. The woodland opportunity plan was published as an online map in 2019 and has been actively used by NNL and partners to strategically guide tree planting. We want to refresh the woodland plan to include new data and also want to strategically examine our hedgerow network, looking for gaps in coverage, and areas where woodland is not appropriate but where hedgerows could provide vital connecting habitat.

[4] Woodland 'condition' refers to how biodiverse the woodland is, surveys would look at the type and age range of trees which form the main woodland canopy, the density and diversity of underlayer trees, the diversity of the ground layer, the hydrology of the woodland and the individual plant and wildlife species supported by the woodland.

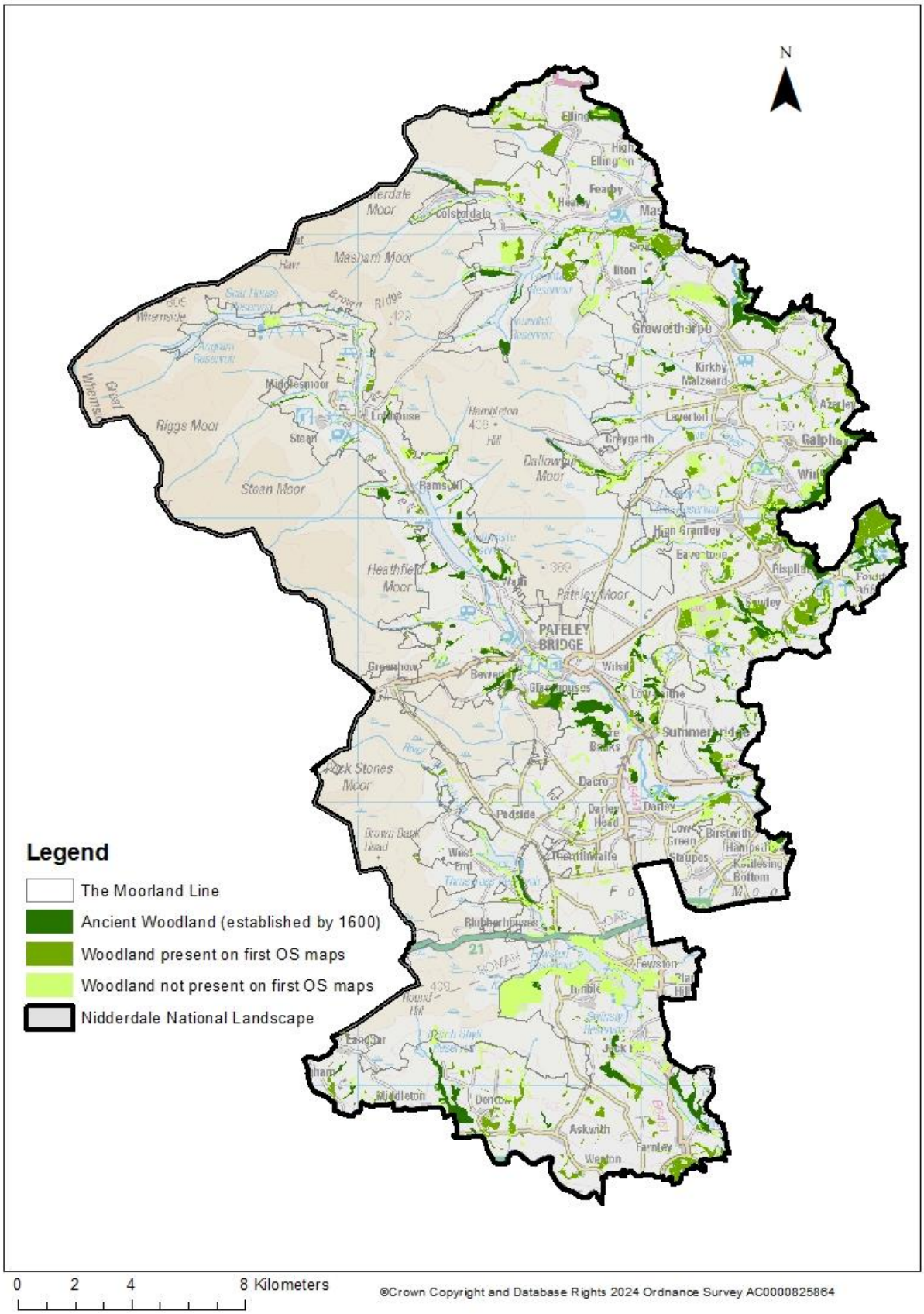


Figure 8: Woodland extent in Nidderdale National Landscape.

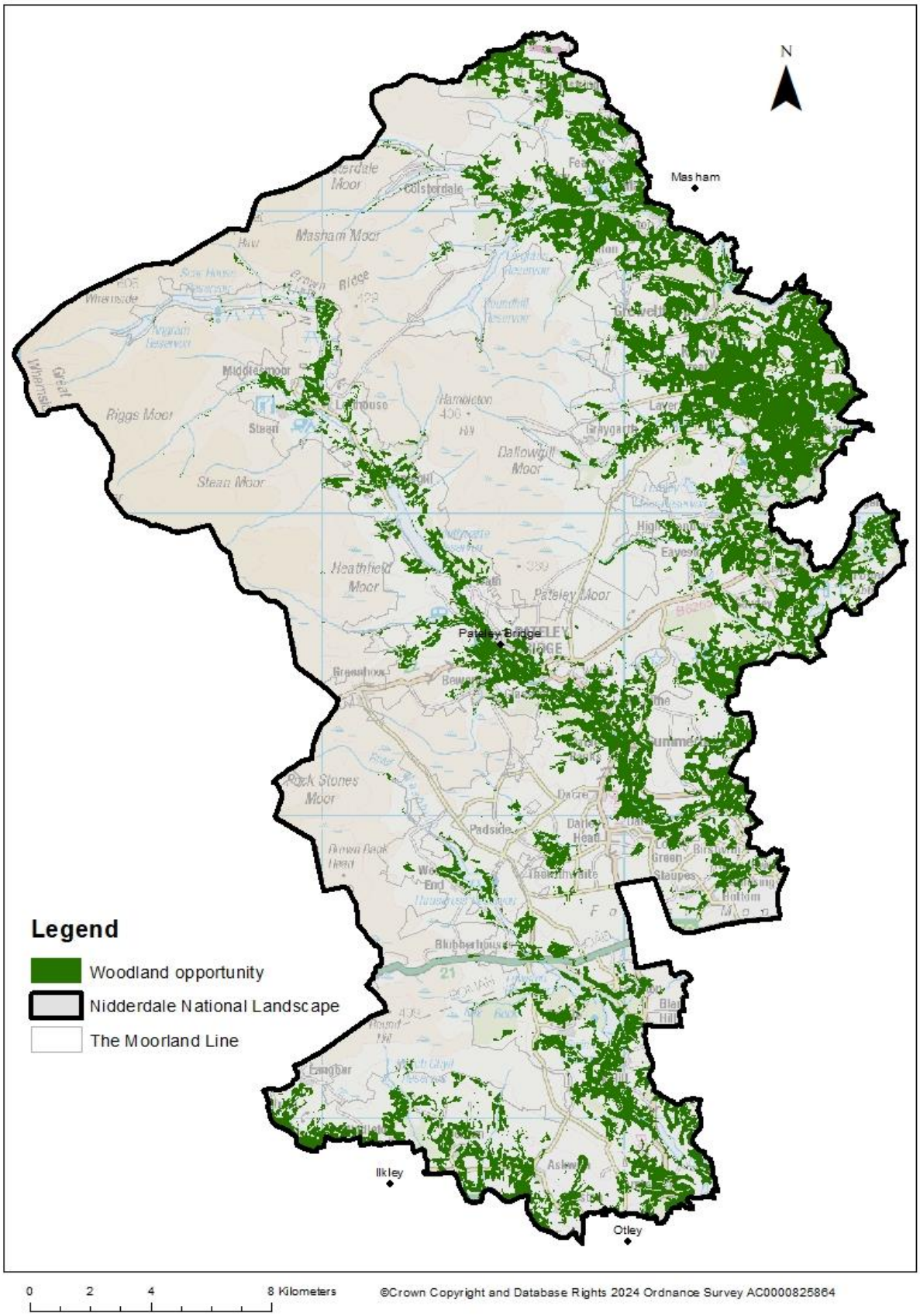


Figure 9: Opportunities for new woodland creation.

Woodland Nature Recovery Overview

In NNL, woodland covers: 8.5% (5,131 ha)

Definition: ancient woodland, long established and more recently planted broad-leaved woodland, conifer woodland, wet woodland, scrub, wood pasture, orchards, hedgerows, veteran trees and trees outside woodland

Vision:

- More new native woodland creation
- More reversion of productive woodland on peat to moorland
- More riparian woodland
- Better connectivity between woodlands
- More ancient woodland in good management
- More hedgerows and trees outside woodlands
- Greater diversity of species in existing woodland
- Better resilience and diversity in productive woodland

Targets:

By 2030	By 2040	By 2050
• Create 375 ha of new native tree cover • Create or restore 80 km of native hedgerow • 70% of existing woodland area in good management • Restore 100 ha of plantation on ancient woodland	• Create a further 750 ha of new native tree cover • Create or restore a further 160 km of native hedgerow • 90% of existing woodland area in good management • Restore a further 300 ha of plantation on ancient woodland	• Create a further 750 ha of new native tree cover • Create or restore a further 160 km of native hedgerow • 100% of existing woodland area in good management • Restore a further 200 ha of plantation on ancient woodland

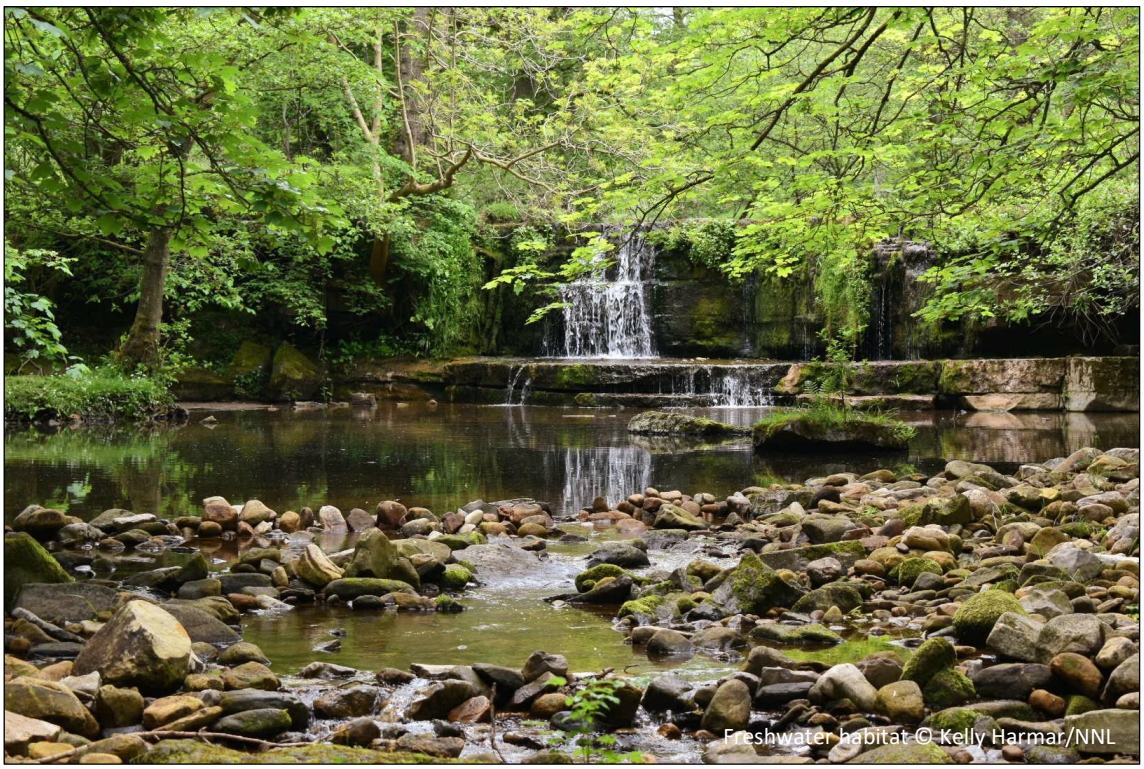
Action Plan:

Land Management Actions	Knowledge Building Actions	Partnership Actions	Finance & Policy Actions
• Deliver an on-going programme of new woodland creation with an emphasis on linking existing woodland • Expand hedgerow cover and tree cover outside woodland • Develop woodland management plans for existing woodlands • Restore plantation on ancient woodland sites • Restore conifer plantations on deep peat to moorland habitat	• Revise the NNL woodland opportunity plan to maintain an up-to-date plan for new woodland • Promote UK Forestry Standard guidance and develop local evidence to enable native woodland creation taking into account sensitive areas • Work as part of the White Rose Forest Partnership to share learning, skills and experience	• Provide consistent advice to landowners on woodland creation and management • Ensure joined up delivery of disease-control information and follow-up action to create resilient woodlands • Develop advice sheets for small landowners • Provide hedgerow and woodland management training courses	• Advocate for grant funding for woodland creation and hedgerow restoration/creation • Seek mechanisms to enable non-governmental investment in woodland creation • Advocate for increased funding for woodland management • Ensure commercial woodland management plans deliver for nature as well as financially

2.5 Freshwater Habitat Plan

2.5.1 Habitat Description

Habitats included are: rivers, streams, underground rivers, ditches, lakes, reservoirs, ponds and springs, flushes, lowland fen, wet woodland and wet grassland.



Our rivers start as seeps and springs that form small streams in steep upland gills in moorland habitat and then become wider and slower, flowing through gently sloping grassland and areas of woodland in the valleys. There are three main river valleys: Nidderdale which runs centrally through the National Landscape from northwest to the east; the Washburn Valley which flows south to the River Wharfe to and Colsterdale in the northeast, where the River Burn flows east to the River Ure. The Rivers Skell and Laver in the east of the National Landscape also flow into the River Ure and are important riparian corridors. Most of our river network is above ground but there are sections in the upper reaches of the River Nidd that travel underground through cave systems. These cave systems are also important habitats, with their own unique fauna.

There are several man-made lakes and 11 reservoirs in the National Landscape, the largest of which is Gouthwaite Reservoir, which covers 127 ha. Some reservoirs supply drinking water to Ripon, Bradford and Leeds, while others are compensation reservoirs that regulate river flows. Lakes are water bodies above 2ha in size, while ponds are characterised as water bodies under 2ha in size. Due to its underlying geology, Nidderdale National Landscape is an important area for ponds, with nearly 1600 currently mapped. These are found within moorland, grassland and woodland habitat.

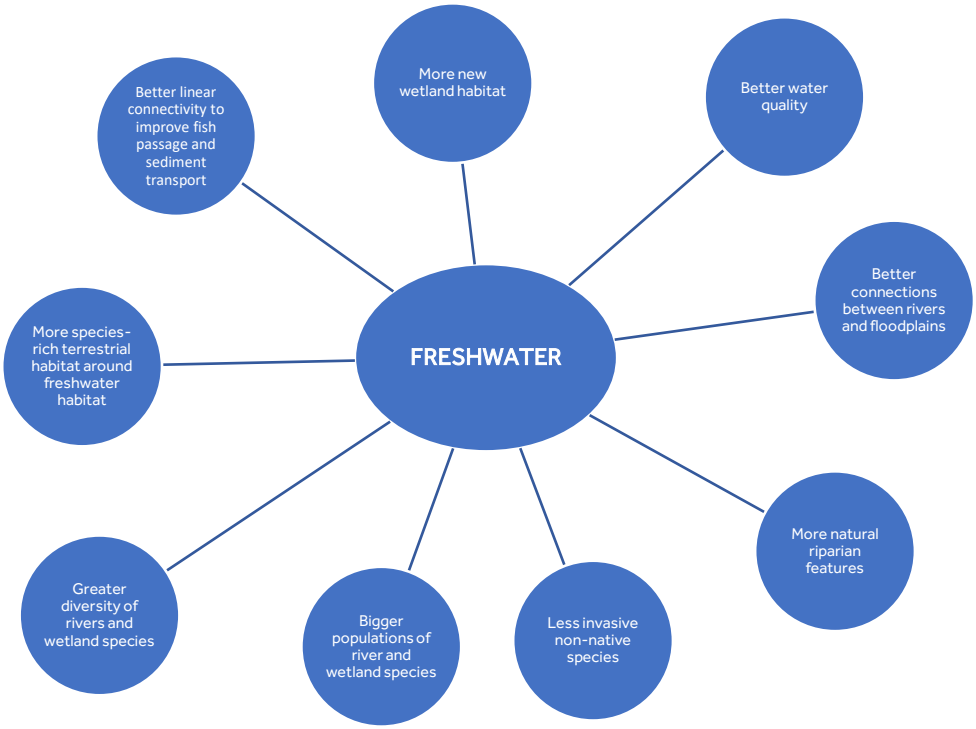
Freshwater habitat also encompasses wetter areas of moorland, woodland and grassland, notably flushes fed by springs and wet woodland and wet grassland close to streams and open water or on soils that are poorly drained. Lowland fen habitat forms in waterlogged soil and is dominated by reeds, rushes and sedges. Many of these transitional freshwater habitats have been drained in the past and the patches that remain are small, fragmented and scattered across the landscape. Flushes, lowland

fen, wet woodland and wet grassland are collectively referred to in this plan as 'wetland' habitat and there are 664 patches of this habitat mapped across the National Landscape.

2.5.2 A shared vision

Our shared freshwater vision that will guide nature recovery work in freshwater habitats is that:

- Rivers are in better condition and are better connected with the wider landscape and their floodplains, restoring natural processes, providing improved riparian habitat and increasing the diversity and abundance of both terrestrial and riparian species.
- Rivers have improved and better connected in-channel habitat, with barriers that limit fish migration and in-river sediment transport removed.
- Water quality in rivers, streams and waterbodies is improved thanks to major reductions in pollutants of all types, including soil sediment, from entering watercourses. Wider changes to land management have also reduced extreme high and low flows and slowed the flow during storm events.
- Wooded riparian habitat, sited to provide shade, cools our rivers and protects sensitive aquatic species from higher average temperatures and extreme weather events associated with climate change.
- New ponds have been created within moorland, grassland and woodland habitats and larger areas of wetter habitat are common across the landscape, providing enhanced habitat for wading birds and other species.
- Existing invasive non-native species have been removed or controlled to limit their impact and any new invasive non-native species are dealt with through early action to limit their spread.



2.5.3 The issues we need to address to enable freshwater nature recovery

- Water quality is poor in the majority of our rivers, with major pollution issues from both point and diffuse sources. Across the 19 defined waterbodies in the National Landscape, the ecological classification is that there are: 1 good, 16 moderate, 1 poor and 1 bad waterbodies.
- Some tributaries have specific problems caused by heavy metal pollution as a consequence of historic lead mining activity.
- Many rivers have fragmented habitat and barriers to fish migration.
- Many rivers and their tributary streams have been heavily modified by the construction of reservoirs, and by the straightening, widening and deepening of river reaches for flood risk engineering or other landscaping.
- Barriers such as weirs may be required for other purposes such as micro-hydropower renewable energy generation.
- Freshwater habitats are often viewed in isolation and their interconnection with other habitats is not always widely understood.
- Creating wetland habitats is not perceived to be profitable for landowners.
- The purpose and/or wider benefits of wetlands are not always clear to farmers and land managers, so they do not seem relevant to day-to-day operations of a working farm.
- Freshwater habitat has a disproportionate importance, relative to the area it covers, within the wider landscape compared to other habitat types and freshwater biodiversity loss (at a global scale) is happening at a significantly greater rate than any other habitat type.

2.5.4 Our story of freshwater nature recovery

Combining the shared vision and issues, we have developed a narrative of how we can work together so that nature recovery can take place across our freshwater habitats. This is how the situation could look by the year 2050:

We have surveyed our freshwater habitat. Initial landscape scale river and stream surveys enabled us to strategically plan projects that have improved river and stream habitat condition. Over several years, we have gradually visited our ponds and wetland sites and created individual wetland management plans that have gradually raised habitat condition. We have a much better idea where our wetland habitat is located and we have used historic maps to find locations to restore lost pond and wetland habitat.

Our rivers and streams are now connected to the landscape that they sit within. The rivers provide large scale linear connections through the landscape free from barriers to fish migration, but there are also important lateral connections along the length of each river as the riparian habitat now better links with surrounding grassland, woodland and moorland, alongside the horizontal connection to the groundwater. The rivers themselves are physically more diverse, with riffles, pools and restored sinuosity, achieved by reinstating features such as natural meanders, oxbow lakes, chutes and midchannel bars and greater space for rivers to move. They have achieved good ecological status (or potential). Rare river species have increased in numbers as water quality has improved and niche habitats are more widespread. For species such as white clawed crayfish, that were on the brink of extinction, we have a network of secure ark sites and we are using these ark sites to slowly expand their population.

Our river habitat has benefitted hugely from the positive changes made to terrestrial habitats throughout our landscape. Flows to rivers have become more regular and natural, with less extreme and less frequent high and low flows. Water quality has improved according to all chemical and biological measures. Improved water quality has reduced the complexity and cost of water supply and increased the quality of our drinking and bathing water. These benefits are also felt downstream from the National Landscape by wildlife and local communities.

The water quality in our reservoirs and lakes has improved because water reaches the reservoirs more slowly and is filtered by healthy soils within catchments with reduced agricultural inputs. The biodiversity of reservoirs has been boosted by diversifying the water edge habitat and by providing new links from the water edge to wider habitats. We have more wetlands and ponds and these new freshwater habitats have been sited to complement our best terrestrial habitat. New ponds have been created in high quality moorland, grassland and woodland habitat and the habitat surrounding existing ponds has been made a priority for nature recovery: better grassland, better woodland and better heathland habitats have improved water quality, improved connections between freshwater habitats and improved foraging for species that rely on both freshwater and terrestrial habitat. The water quality of ponds and wetland habitat has improved.

We have more wetness in the landscape: more wet woodland, damp grassland and re-wetted moorland. These wet habitats store water, helping regulate our rivers, and provide habitat for species (including water voles and water shrew) that had declined in the past due to land drainage. For our wading birds, an increased number and wider distribution of wet scrapes has helped breeding success, as food supplies are more abundant and closer to nest sites meaning adults can spend less time searching for food.

Biocontrol measures have ensured that new introductions of invasive non-native species are rare and a rapid reporting system means that new risks are quickly removed. For established invasive non-native species, systematic control programmes starting at the top of the catchment are gradually eradicating and controlling these species. Where needed, deliberate gaps in water body connectivity have been left in place to avoid the spread of invasive species. For Himalayan balsam, the introduction of rust fungus

as a biocontrol has been successful. The rust has spread widely on the Nidd and has been successfully introduced to other catchments. This has reduced the competitiveness of Himalayan balsam so that, though it remains part of our riparian flora that is distributed at a low level throughout stands of native vegetation, it is no longer dominant.

2.5.5 Where to focus our efforts now

The emphasis for rivers, streams and for large water bodies will be on habitat restoration and enhancement. For ponds and wetlands we will enhance habitat within wetland and pond clusters and we will create new habitat outside these clusters that facilitates species movement across the landscape. The freshwater opportunity maps show areas where habitat enhancement or creation could provide benefits in the landscape should the land manager of that site wish to pursue this approach on that part of their landholding. It is important to recognise these areas as opportunities.

Habitat condition: restoration and enhancement of habitats

The challenge to improve river water quality is daunting, with diffuse agricultural pollution, sewage discharges and heavy metal contamination taking a heavy toll on our freshwater habitat. Water quality monitoring in the River Wharfe on our southern boundary through the iWharfe project, and water quality monitoring on the Nidd through the planned iNidd project, will help guide work in these catchments, showing locations along the river where pollutant levels are significantly higher than measurements upstream. Our ambition is that a similar water quality monitoring network be set up on the Burn, Skell and Laver. Work will also centre on known problem areas for metal mine pollution such as Ashfoldside Beck. Beginning to change the physical condition of our waterbodies will also be challenging. We will start by identifying opportunities that give space to allow rivers and streams to function more naturally.

For ponds and wetlands, clusters have been identified that show concentrated areas of freshwater habitat (Figure 10). Work to survey habitats and improve wetland quality will be targeted within these clusters, with management plans to improve habitat management and water quality. We also aim to prioritise restoration and creation of terrestrial habitats within these freshwater clusters so that we can drive improved water quality in the freshwater habitat that drain from the terrestrial habitats and so that we can improve foraging and hibernation habitat for amphibians. Research using historic maps and aerial photography can also be used to find locations where wetlands and ponds have been drained and filled in so they can be restored.

Habitat creation: strategic new habitat

Habitat creation will focus on new pond and wetland creation. New pond and wetland habitat sites will be chosen to connect wetland and pond clusters to aid species movement across the landscape. Connections may be relatively direct, with new habitat created within 1km of existing habitat, or new habitat may be planned as several linked stepping-stones between pond and wetland clusters several kilometres apart. New ponds and wetlands will be created within existing high quality semi-natural terrestrial habitat so that new freshwater habitat will be of high-water quality and will be surrounded by good foraging and hibernation habitat for amphibian species.

Figure 11 shows the highest scoring opportunities for connecting wetland and pond clusters across the National Landscape. This shows a visually striking broad linear sweep of high scoring habitat opportunity moving north and east from the River Wharfe in the southwest of the National Landscape, through the Washburn Valley, and Nidderdale, through to the Lower Ure at the northeast periphery of the National Landscape. High scores in these areas are driven by overlapping connections between freshwater clusters, by a ribbon of concentrated semi-natural habitat and by a lack of A and B roads in this area of the National Landscape. We will seek to create new ponds and wetland habitat within semi-natural habitat in the high scoring opportunity areas.

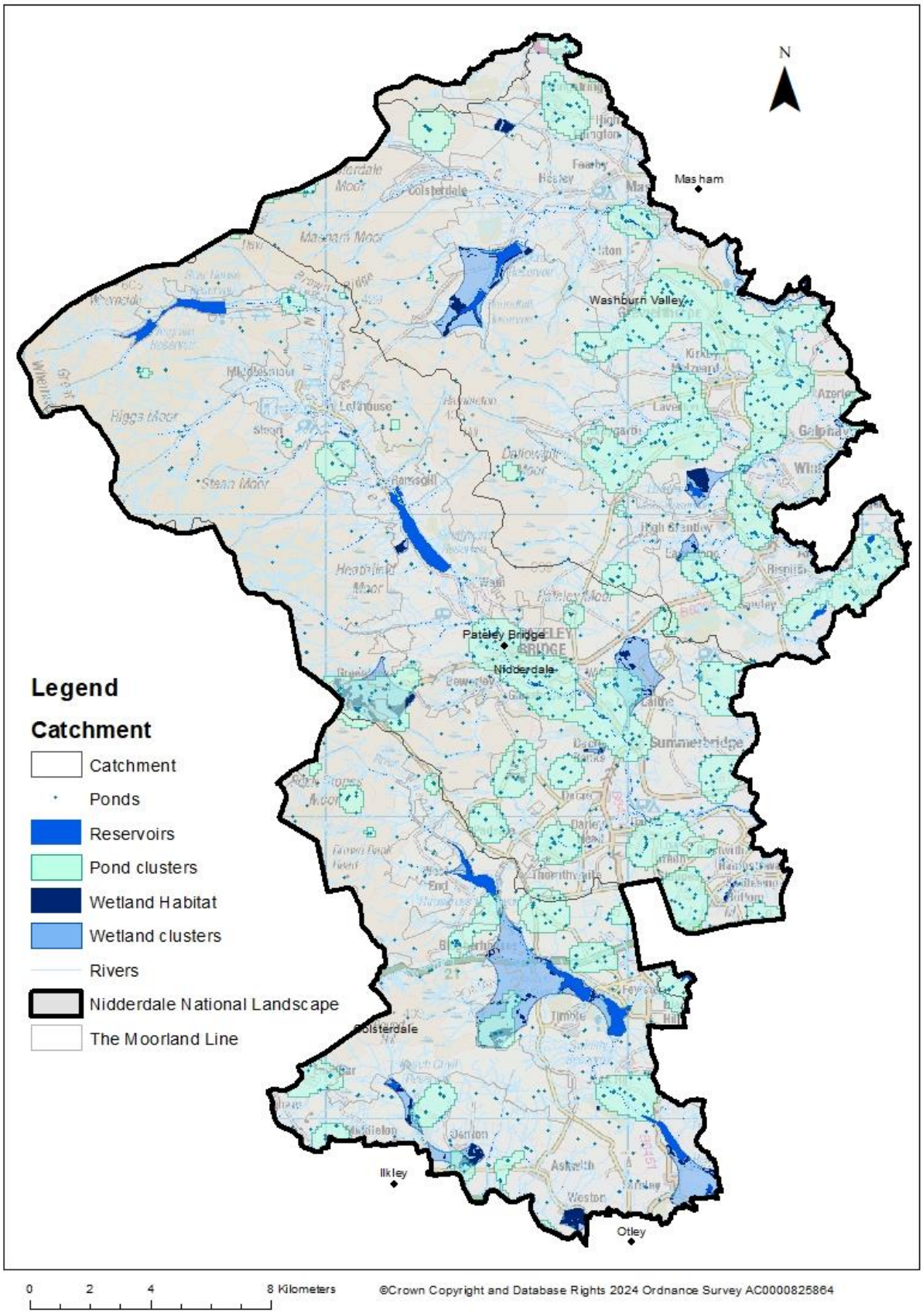


Figure 10: Freshwater extent in Nidderdale National Landscape.

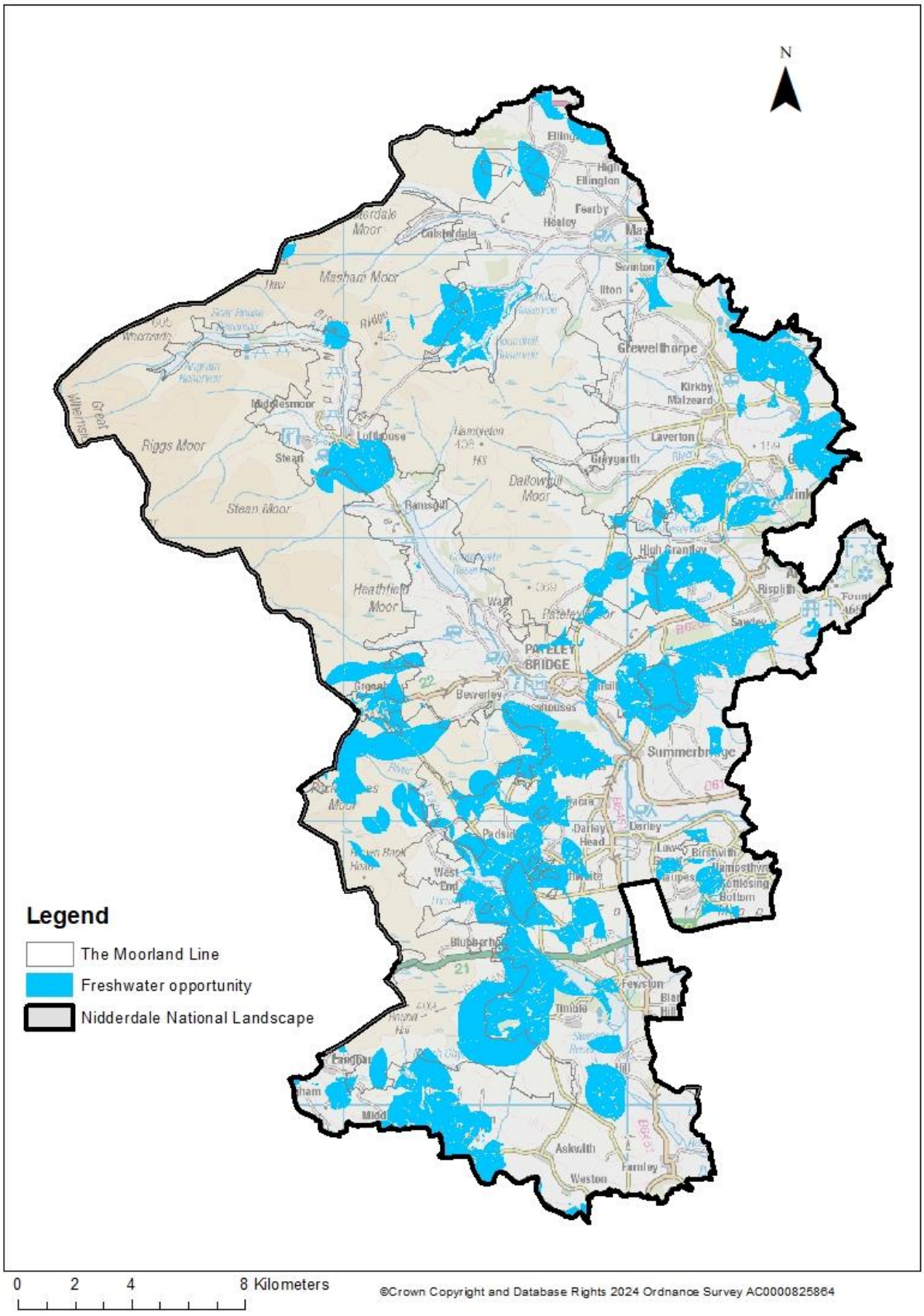


Figure 11: Opportunities for freshwater habitat creation.

Freshwater Nature Recovery Overview

In NNL, freshwater covers: 1.2% (751 ha)

Definition: rivers, streams, underground rivers, ditches, lakes, reservoirs, ponds, wet woodland, wet grassland

Vision:

- More new wetland habitat
- Better connections between rivers and floodplains
- Greater diversity of rivers and wetland species
- Better water quality
- Less invasive non-native species
- More species-rich terrestrial habitat around ponds / wetlands
- More natural riparian features
- Bigger populations of river and wetland species

Better linear connectivity to improve fish passage and in-river sediment transport

Targets:

By 2030	By 2040	By 2050
• Actions in place on 70% of watercourses to achieve good ecological status or potential	• 70% of watercourses in good ecological status or potential	• 100% of watercourses in good ecological status or potential
• 50% of existing wetland habitat in good management	• 75% of existing wetland habitat in good management	• 100% of existing wetland habitat in good management
• 150 new wetland habitat sites created or restored	• A further 300 of new wetland habitat sites created or restored	• A further 300 of new wetland habitat sites created or restored

Action Plan:

Land Management Actions	Knowledge Building Actions	Partnership Actions	Finance & Policy Actions
• Develop wetland management plans to improve existing wetland habitat condition • Create new wetland habitat • Restore natural processes in river systems • Deliver projects to alleviate heavy metal pollution in rivers • Upgrade infrastructure to reduce human pollution in watercourses	• Undertake wetland survey to locate existing and historic wetland habitats and help prioritise conservation action • Undertake regular river water quality surveys to identify pollution inputs and monitor change	• Continue catchment sensitive farming programme to reduce agricultural pollution in water courses • Continue partnership working through the Dales to Vale River Network • Continue and expand action to mitigate impacts of invasive non-native species • Educate residents to reduce impacts of private septic tanks	• Advocate for recognition of importance of links between wider terrestrial habitat and wetlands in ELM • Seek mechanisms to reward land managers for positive actions to improve water quality • Advocate for a simplified process for wildlife pond / wetland creation

2.6 Species Action Plans

In addition to the four habitat plans for moorland, grassland, woodland and freshwater, we have identified a small number of species where additional action over and above the habitat actions is required to safeguard and help their recovery.

The species included are:

- Adder
- Black grouse
- Curlew
- Waxcap fungi

2.6.1 Species Action Plan – Adder (Vipera berus)

Common name: Adder	Latin name: Vipera berus	Taxa: Reptile
Why a champion species?	Needs specific microscale habitat that can't be provided at a landscape scale	
National population	Nationally, adder populations are declining and their distribution is shrinking. The Make the Adder Count survey at 260 sites confirmed a significant average decline across sites with small adder populations (Gardener, et al. 2019). At sites with large populations (> 10 adders) populations were growing at a low rate but these sites accounted for <10% of surveyed sites. The study suggested that "if these trends continue, within 15–20 years, adders will be restricted to a few large population sites, significantly increasing the extinction risk for this priority species in the UK". The survey included sites in England, Wales and Scotland but there were relatively few survey sites in Northern England.	
Local population	We have systematically surveyed potential adder sites across Nidderdale National Landscape since 2017 and we receive ad hoc public sightings through our adder watch web page. There are at least 30 known individual hibernation sites in the National Landscape, five of which we have confirmed to be nationally important sites that support 10 adders or more. Many hibernation sites are in close proximity, within suitable habitat, and this suggests larger, more sustainable, macro populations. We also have evidence of successful breeding, with young adders observed at several sites. However, we believe some sites to only have small, isolated and vulnerable populations.	
Habitats	Reptiles can hunt in grassland, heathland and woodland sites but they generally need open, sunny locations for hibernation. In the National Landscape hibernation sites are generally found in south facing gills or sunny stone walls. Adders remain at hibernation sites for several weeks after hibernation and they need a diverse habitat structure surrounding hibernation sites: short vegetation for basking and longer vegetation for shelter. These microhabitats need to be side by side so adders can bask and then easily retreat to cover if disturbed.	
Pressures	• Disturbance – adders spend significant time out in the open basking so they are vulnerable to disturbance • Habitat management – adders need microhabitats with short and long vegetation side by side. Management that reduces variation, such as overgrazing, or allowing bracken to spread, can make sites unsuitable for adders • Habitat fragmentation – individual sub populations can become separated and cannot interbreed • Woodland planting at hibernation sites – shading at hibernation sites can make them unsuitable for adders • Wildfire – adders are particularly vulnerable to wildfire as they are slow moving. They hibernate in groups and one wildfire in winter could eliminate an the entire adder population at a site. • Persecution – adders can be perceived as a threat to humans, to dogs and to livestock	
Actions	• Install fencing at key sites to manage disturbance pressure from people and livestock • Work with land managers so that site management is either sympathetic to or specifically for adders • Bigger, better more joined up adder habitat • Continue adder surveys and share adder data with partners so we can prevent inappropriate tree planting • Develop fire breaks close to adder hibernation sites to protect hibernating adders from wildfire • Continue to communicate positive messages about adders to the public and land managers	

2.6.2 Species Action Plan – Black grouse (Lyrurus tetrix)

Common name: black grouse	Latin name: *Lyrurus tetrix*	Taxa: Bird
Why a champion species?	Black grouse requires several different habitats in close proximity and may not be adequately provided for by single-habitat focused plans. Dispersal ranges for male birds are small so translocation may be needed to help the population spread to suitable sites.	
National population trend	The 2021 black grouse strategy document for England produced by GWCT suggests that black grouse range contracted by 68% between 1968-72 and 1998. Black grouse has been lost from Exmoor, Dartmoor, the Peak District, the Bowland Fells, southern Pennines and the Lake District. The remaining population is restricted to two distinct areas: Northumberland and the Yorkshire Dales/North Pennines. Populations within Northumberland declined between 1998 and 2014, while populations in the Yorkshire Dales and North Pennines increased.	
Local population	Black grouse was locally extinct in Nidderdale. Male birds from the North Pennines National Landscape were translocated to an area in Upper Nidderdale in 2011 in a project led by GWCT. This new population has persisted, as male birds are still present, but the population has not expanded and has not dispersed to new sites.	
Habitats	Black grouse utilise moorland fringe habitat. Habitat is centred around a Lek, or display site, used for courtship. Black grouse require several habitats in close proximity to the lek, with each different habitat supporting black grouse at different times of the year. GWCT research analysed the composition of habitat surrounding 155 leks and suggests that, on average, habitat was made up of 41% upland heath and blanket bog, 28% grass moor, 17% rough grazing, 11% enclosed 'inbye' grassland and 2% woodland.	
Pressures	• Habitat simplification - our current landscape is too simplified, black grouse require a mix of different habitats in close proximity to support them throughout the year • Habitat management – grassland management can affect food availability and the survival of chicks in wet summers • Susceptibility to extreme weather events, exacerbated by climate change • Predation	
Actions	• Use our black grouse habitat opportunity mapping to help create and connect new, diverse, black grouse habitat in Upper Nidderdale to provide suitable conditions for range expansion • Work with land managers to ensure rough grazing is sustainably grazed to support increased chick survival • Create new species rich meadows to provide flowers and seed for black grouse • Increase the number and coverage of gill woodlands to provide winter food and shelter	

2.6.3 Species Action Plan – Eurasian curlew (Numenius arquata)

Common name: Eurasian curlew	Latin name: *Numenius arquata*	Taxa: Bird
Why a champion species?	Management and vegetation structure are key, not habitat condition. Curlew is representative of other wading birds also experiencing population decline: lapwing, snipe, oyster catcher, golden plover and red shank.	
National population trend	National data shows a dramatic decline in curlew density and distribution. The UK curlew population is thought to have declined by 48% over a 25 year period between 1995 and 2020 (Harris, 2022).	
Local population	Research by the Northern Upland Chain Local Nature Partnership (NUC LNP) found that the NUCLNP area, including Nidderdale National Landscape, supported 49% of the breeding curlew population in England and Wales (in an area that accounts for only 4.9% of the land area). In the national landscape curlew was our most commonly recorded bird during three years of bird surveys under our Wild Watch Project. However, a recent study as part of the Darley Beck project showed breeding success in grassland habitat was very poor. In 2022, across 294 fields, and 31 nesting attempts, 116 eggs were laid. 96 eggs hatched but only one chick survived to fledge. In 2023, despite interventions to improve breeding success, only two chicks fledged (NNL, 2024). Our worry is that the curlew that we see throughout our grasslands today are mature adult birds which are not breeding successfully and are not being replaced. When these older birds die, we may be facing a cliff edge population decline.	
Habitats	Waders are spring and summer visitors that return to the National Landscape each year to breed. They prefer open landscapes and breed in moorland and grassland habitats. They need structure and variation within habitats to provide protection for nest and shorter vegetation for feeding. Waders overwinter in coastal habitats.	
Pressures	• Intensification of farming – stocking densities are higher in pastures and hay meadows have been replaced by silage fields. These affects breeding success: eggs are trampled by livestock and eggs and chicks are destroyed by cutting equipment. • Land drainage – drainage of wet grassland habitat has reduced feeding habitat availability and quality • Tree planting – new trees provide vantage points and expanded habitats for predators • Disturbance – recreational use of moorland and grassland habitats in the breeding season, can cause wading birds to leave their nest which can be fatal to eggs and chicks under poor weather conditions • Climate change – climate change may cause a shift in curlew distribution northwards, and to higher elevation, as warmer conditions and drought potentially impact on the invertebrates that curlew feed upon • Predation – ground nesting birds are vulnerable to predators	
Actions	• Increase the area of grassland managed for nature so that core grassland areas of quality grassland habitat can be managed sympathetic to or specifically for wading birds • Work within more intensively farmed areas to support wading birds, e.g. nest fencing • Collate bird survey data from partners to provide up to date information to guide tree planting. Identify gaps in survey coverage to prioritise for new surveys • Consider the use of predator control for core grassland sites to support wading bird recovery	

2.6.4 Species Action Plan – Waxcap fungi (CHEGD fungi)

Common name: waxcap fungi (spindles, club and coral fungi, waxcaps, pinkgills, earthtongues and crazed caps)	Latin name: Collectively known as CHEGD fungi (*Clavarioids*, *Hygrocybe*, *Entoloma*, *Geoglossum* and *Dermoloma*)	Taxa: Fungi
Why a champion species?	Many species are only found on 'ancient grassland' sites which need to be protected from habitat change	
National population trend	Waxcaps are understudied and their national distribution is uncertain. As they are tied so strongly to undisturbed 'ancient grassland' sites, their distribution is understood to have declined as agricultural grassland management has intensified.	
Local population	Surveys for grassland fungi in the National Landscape began in autumn 2023, led by NEYEDC and funded by a Farming in Protected Landscape grant. All our grassland surveys have previously been undertaken in summer and have not recorded waxcap fungi. Surveys have started to identify key sites which have a diversity of waxcap species and sites with rarer waxcap fungi such as ballerina (*Porpolomopsis calyptriformis*) and crimson waxcap (*Hygrocybe miniata*) have been identified. There is high potential for waxcaps in Nidderdale due to acid soils and extensive pasture. 22 waxcap species have been recorded in the HDNS recording area, which includes the National Landscape north of Thornthwaite and Greenhow (Walker, 2021)	
Habitats	Waxcaps are largely grassland species, found on nutrient poor sites and mainly on acid or neutral soils. They are sensitive to disturbance and are often restricted to 'ancient grasslands' that have not been ploughed, reseeded or received any artificial fertiliser. Old pastures and meadows are good sites but they can also be found in church yards and cricket pitches. Waxcap grasslands can be botanically rich but they can equally occur in species poor grassland.	
Pressures	• Changes to site management such as ploughing seeding and use of artificial fertiliser • Tree planting • Loss of habitat to development	
Actions	• Continue autumn grassland surveys to identify sites that support waxcap fungi and raise awareness with the public to encourage public sightings of waxcaps to be submitted • Work with land managers so that site management is either sympathetic to or specifically for waxcaps • Share survey data with partners to guide tree planting across the National Landscape • Encourage waxcap surveys as part of EIAs for unimproved grassland sites to ensure development does not impact on waxcap grasslands	