# LOCAL NATURE RECOVERY STRATEGY (LNRS) REPORT

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| Site: | Example |
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Thames Valley Environmental Records Centre

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# Introduction

The Local Nature Recovery Strategies (LNRS) are a series of strategic networks across England which propose actions to benefit nature recovery and biodiversity, as well as providing wider environmental benefits across the network and in the broader landscape.

Each LNRS is comprised of, at the very least, a list of priorities and potential measures that are recommended for delivery and a local habitat action showing three layers. The three layers are; (1) the existing 'Areas of particular Importance for Biodiversity (APIB)', (2) possible 'Areas that could become particularly important for biodiversity' (ACB), (3) the 'Potential measures' (PM) layer that maps specific actions to support habitats and species to specific locations.

The APIB 'areas of particular importance for biodiversity' are the existing areas that are already known to be important including nationally and locally designated sites such as SSSI and LWS, as well as irreplaceable habitats such as ancient woodland.

The ACB 'areas that could become particularly important for biodiversity' are the key opportunity areas to target nature recovery actions in the county in order to create a resilient, joined up network for nature in the area.

The PM potential measures layer maps out measures for habitat creation, enhancement, and restoration as well as specific actions to support species that are at risk in the county. These actions are mapped to locations where their delivery is expected to significantly contribute towards local and country-wide environmental goals. It is important to note that the LNRS is an evidence base or a tool to help guide decision-making.

The main purpose of the LNRS map is to show which locations hold the greatest potential to benefit nature and the wider environment if habitats were created or enhanced in those places. However, this does not mean that landowners and managers would be required to implement any of these measures. Instead, the Government expects that mapped areas would attract and encourage more nature recovery investment and funding opportunities. The LNRS itself does not have powers to preclude or prevent development or any other type of land use.

The map offers high-level recommendations based on a range of the best and latest data available including soil data. However, to ensure the right habitat is created in the right place, all locations still need to be sense-checked in-person, on the ground with the relevant professionals to ensure that your actions are suitable for the current conditions on the site i.e. soil tests, surveys of existing habitats or species, topography, hydrology, and any sites that have special designations or features that may require special consideration (e.g. heritage features). Land manager preference is also a factor, some sites may be more suited to one measure over another based on the current land-use or site assessments and some sites may be suitable for multiple, complementary measures that could be delivered within the same location.

# Local Nature Recovery Areas

## *Areas of particular importance for biodiversity - APIB*

The Areas of Particular Importance for Biodiversity (APIB) are the areas of known current importance including nationally and locally designated sites such as Sites of Special Scientific Interest (SSSI) and Local Wildlife Sites (LWS), as well as irreplaceable habitats such as ancient woodland.

These are places that are already great for wildlife and are important to continue to protect.

## *Areas that could become of particular importance - ACB*

The Areas that Could Become of particular importance (ACB) are the remaining areas of the Local Nature Recovery Strategy Network outside the areas covered by the APIB.

These are areas identified as the best opportunities for nature recovery.

## *Summary of Local Nature Recovery areas*

| Biodiversity Areas | Area (ha) in wider area (2km) | % of area in wider area (2km) | Area (ha) in site boundary | % of area in site boundary |
|---|---|---|---|---|
| Oxfordshire - Areas that could become of particular importance | 563.51 | 35.98 | 12.83 | 100 |
| Oxfordshire - Areas of particular importance for biodiversity | 128.20 | 8.19 | 0.00 | 0 |

## ***Potential Measures - PM***

The Potential Measures areas are comprised of the mapped biodiversity priorities and measures for habitat creation, enhancement, and restoration which will help contribute towards local and county-wide environmental goals. Projects could deliver some or all of the measures based on what is most suitable for the particular site and or any land use requirements of the site. The Potential Measures presented are opportunities for consideration but there is no requirement to make any changes under the LNRS strategy.

The table below shows a summary of the Potential Measures that are found close to your area. The area given is the sum of the area of each Potential Measure. Please note that some Potential Measures are overlapping.

By delivering any of the Potential Measures, you can be confident you are directly contributing to the delivery of a collaboratively created set of priorities for people and organisations in Oxfordshire.

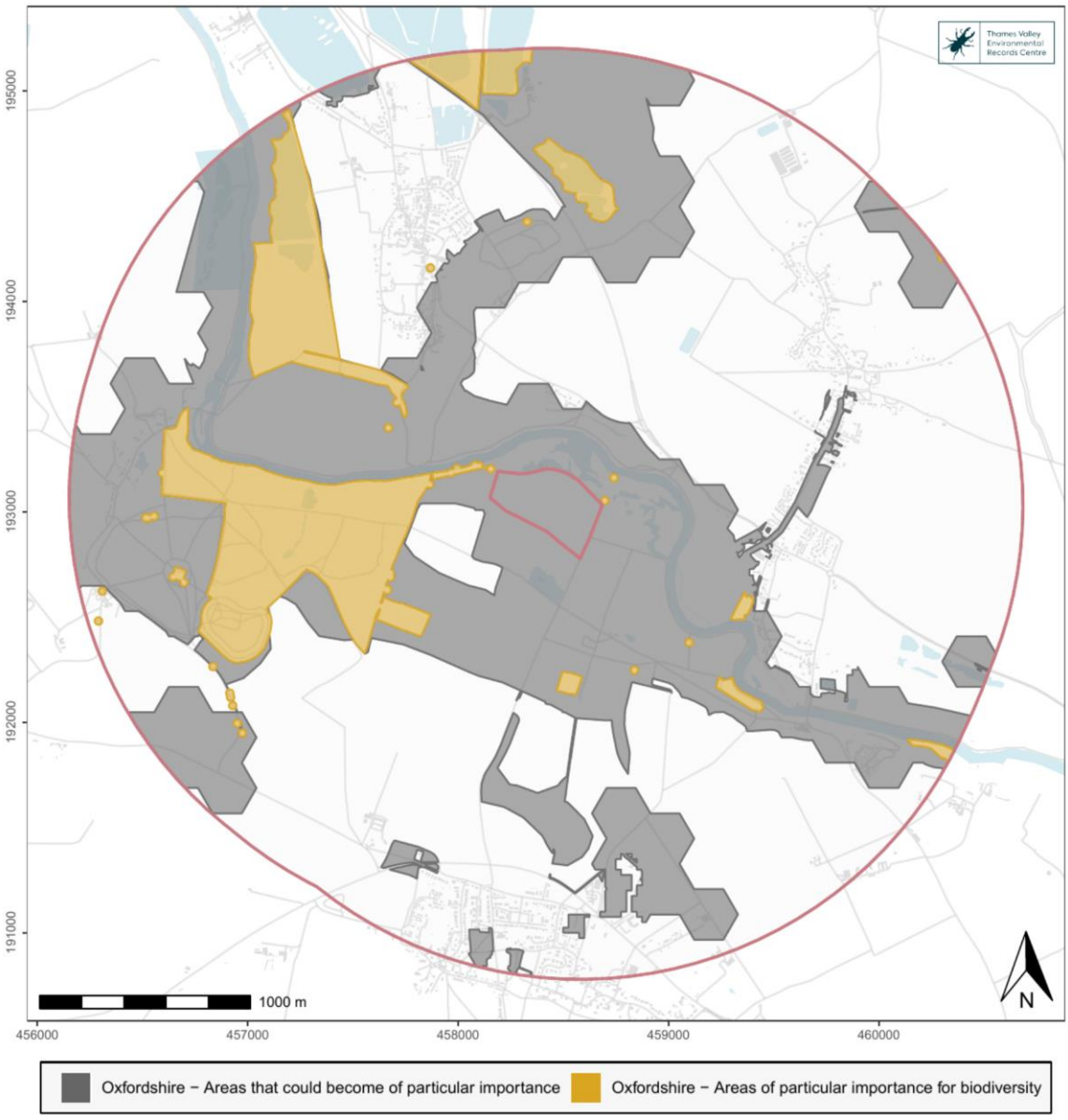
## ***Summary of Potential Measures***

| | Number of Measures in 2km | Sum of Areas (ha) in 2km | Number of Measures in site boundary | Sum of Areas (ha) in site boundary |
|---|---|---|---|---|
| Oxfordshire- Habitat Potential Measures | 26 | 2,303.07 | 10 | 53.23 |
| Oxfordshire- Species Potential Measures | 10 | 695.76 | 2 | 3.34 |

## ***Maps of Local Nature Recovery areas***

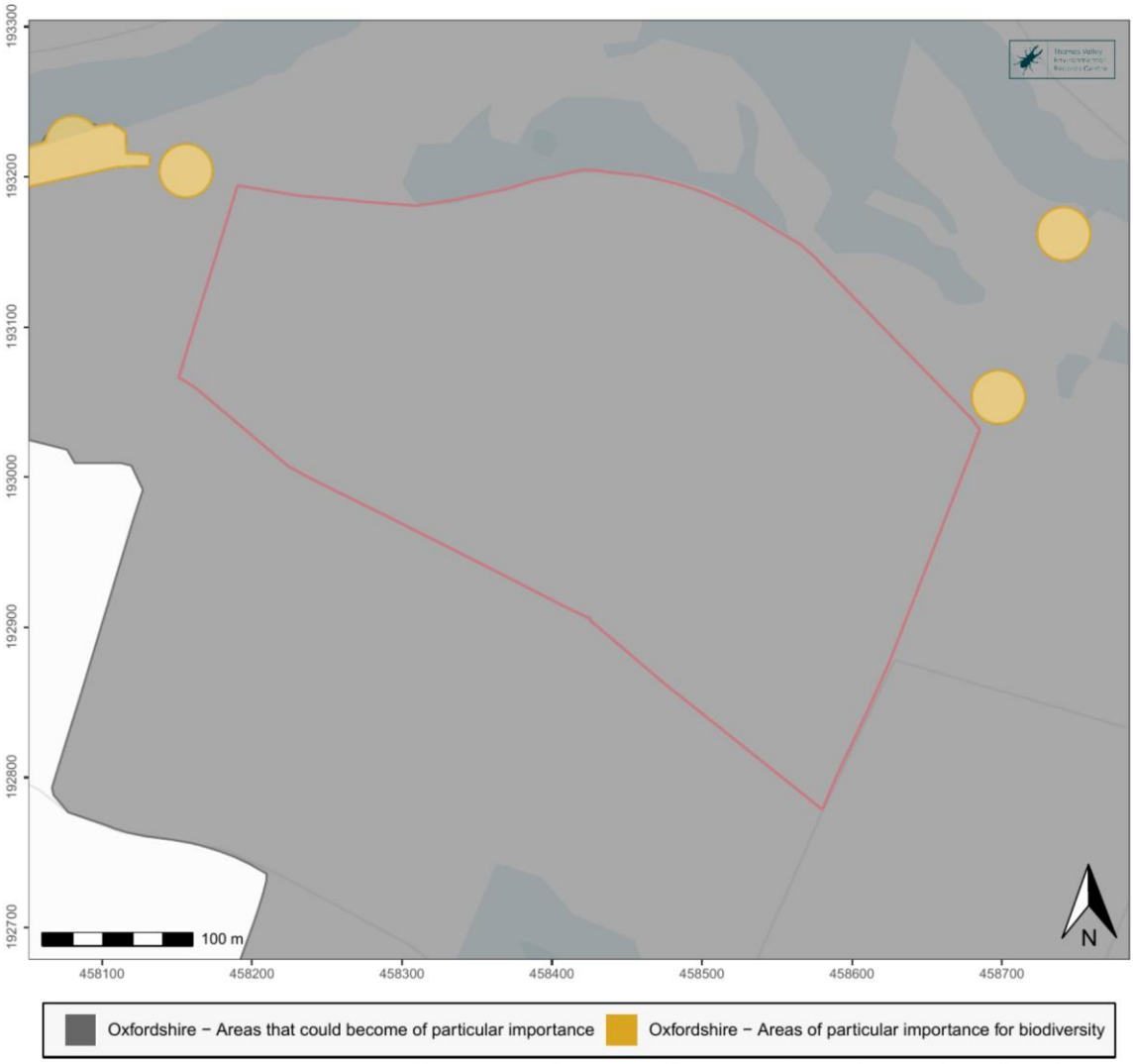
TVERC/25/0000 Example

Local Nature Recovery Strategy (LNRS) Map
2km search area



# TVERC/25/0000 Example

Local Nature Recovery Strategy (LNRS) Map
Site boundary



# Oxfordshire

The Oxfordshire Local Nature Recovery Strategy covers over 40% of the county, meaning that over a third of Oxfordshire is of current or potential importance to biodiversity. There are 37 mapped Potential Measures for habitats and 43 Potential Measures for species in the Oxfordshire LNRS. These are areas with opportunities for habitat enhancement, creation, and restoration across Oxfordshire. There are a further 48 habitat and 20 species broad-scale Potential Measures which are not mapped in the Oxfordshire LNRS but are suitable for consideration county-wide.

The following Potential Measures are located within close proximity to your site and should be considered to benefit nature recovery and biodiversity. If there are any Potential Measures within your site boundary or 100m of your central point, these are shown in bold.

## Recommendations for Local Nature Recovery - Habitat Measures

### *Overview of Habitat Measures*

| PM ID | Measure Name | Area (ha) in 2km | Area (ha) in site boundary |
|---|---|---|---|
| 58 | **Create Floodplain Grazing Marshes** | **233.65** | **12.83** |
| 54 | **Create Wetland Habitat Matrices** | **369.25** | **12.83** |
| 55 | **Create Ponds** | **513.13** | **12.78** |
| 6 | **Create Neutral Grassland** | **92.94** | **7.46** |
| 40 | **Create Wet Woodland** | **236.96** | **3.11** |
| 42 | **Restore & Manage Rivers & Riparian Areas** | **247.65** | **2.63** |
| 30 | **Create Grassland & Woodland Matrix Habitats** | **80.48** | **1.54** |
| 46 | **Enhance Ponds** | **6.77** | **0.06** |
| 33 | Enhance Woodland | 56.58 | 0.00 |
| 17 | Manage Scrub | 8.88 | 0.00 |
| 1 | APIB | 128.21 | 0.00 |
| 9 | Create Lowland Meadow | 73.91 | 0.00 |
| 11 | Enhance Neutral Grassland | 66.86 | 0.00 |
| 5 | Create Calcareous Grassland | 57.73 | 0.00 |
| 75 | Restore Biodiversity Around Heritage Assets | 39.87 | 0.00 |
| 76 | Create & Enhance Greenspace in Urban Areas | 32.53 | 0.00 |
| 26 | Enhance Traditional Orchards | 15.87 | 0.00 |

| PM ID | Measure Name | Area (ha) in 2km | Area (ha) in site boundary |
|---|---|---|---|
| 29 | Create Wood Pasture & Parkland | 13.30 | 0.00 |
| 38 | Create Woodland | 11.37 | 0.00 |
| 14 | Enhance Lowland Meadow | 6.46 | 0.00 |
| 35 | Enhance Ancient Woodland | 3.87 | 0.00 |
| 23 | Enhance Wood Pasture & Parkland | 2.60 | 0.00 |
| 10 | Enhance Calcareous Grassland | 2.19 | 0.00 |
| 78 | Create & Enhance Habitats to Complement Community Use | 1.69 | 0.00 |
| 51 | Manage Fen Buffer Areas | 0.21 | 0.00 |
| 50 | Enhance Fens | 0.12 | 0.00 |

## Oxfordshire Potential Measure 58: Create Floodplain Grazing Marshes

Part of a series of rivers, streams, ponds, standing water, and wetland habitat measures.

There is **12.83 ha** of Potential Measure ID 58: Create Floodplain Grazing Marshes within your site boundary and **233.65 ha** within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Coastal and floodplain grazing marsh is found on low-lying coasts and along slow-flowing rivers and estuaries. Some 500 plants have been recorded from the most diverse grazing marshes, but these comprise just 5% of grazing marshes - most have been agriculturally 'improved' and are of limited botanical interest. Perennial rye-grass, Yorkshire fog and rushes tend to dominate the sward, enlivened by damper patches of floating sweet-grass, creeping bent and silverweed. However, freshwater or brackish ditches (created for drainage purposes) and the remains of old creek systems where farmed land has been created on former saltmarsh can support interesting plants and good populations of invertebrates, including those such as dragonflies and damselflies that have both aquatic and terrestrial stages. Tussocky (areas where grass is longer and thicker) and damp swards provide good habitat for foraging and breeding waders, and shallow flooding creates ideal conditions for wildfowl during the winter.

Floodplain grazing marsh is defined by proximity to water, topography and management rather than the underlying substrate or the vegetation. Floodplain grazing marsh has generally been embanked, drained and agriculturally improved, however, in some cases, grazing marshes were created on better drained floodplains through the use of sluices and ditches, plenty of grass and field boundaries for grazing livestock."

from The Wildlife Trusts

### *Description*

This mapped measure indicates areas for the creation of areas of new good quality grazing marsh, and enhancement (or maintenance to achieve good long term condition) of existing floodplain grazing marsh. The aim of this measure is to create, enhance, and manage habitats within Oxfordshire's floodplains including wet grasslands and wetland habitats to achieve biodiverse habitats that support a rich array of species; as well as to link and connect these habitats by creating and managing wildlife corridors along rivers and streams, providing natural flood management services and improved water quality.

### *Action*

Floodplain grazing marsh benefits from management that allows it to be periodically covered by shallow standing water. These habitats can often be found within, around, or near to a mix of other wetland habitat types. Found close to water, floodplain grazing marsh habitats have ditches running through them which require sensitive, rotational management to support species. Within the management plan for grazing marsh, aim to achieve a varied vegetational structure with appropriate levels of rush cover to support breeding waders and a diversity of ground cover including patches of bare ground and pockets of scrub to provide a broad range of niches for invertebrates and other species. These sites require light grazing (not overgrazing) to maintain plant diversity and cattle are

typically a particularly good option. Avoid draining these habitats and instead aim to maintain water levels so that they are close to the field level throughout the year with natural and steady variation above and below that level throughout the year.

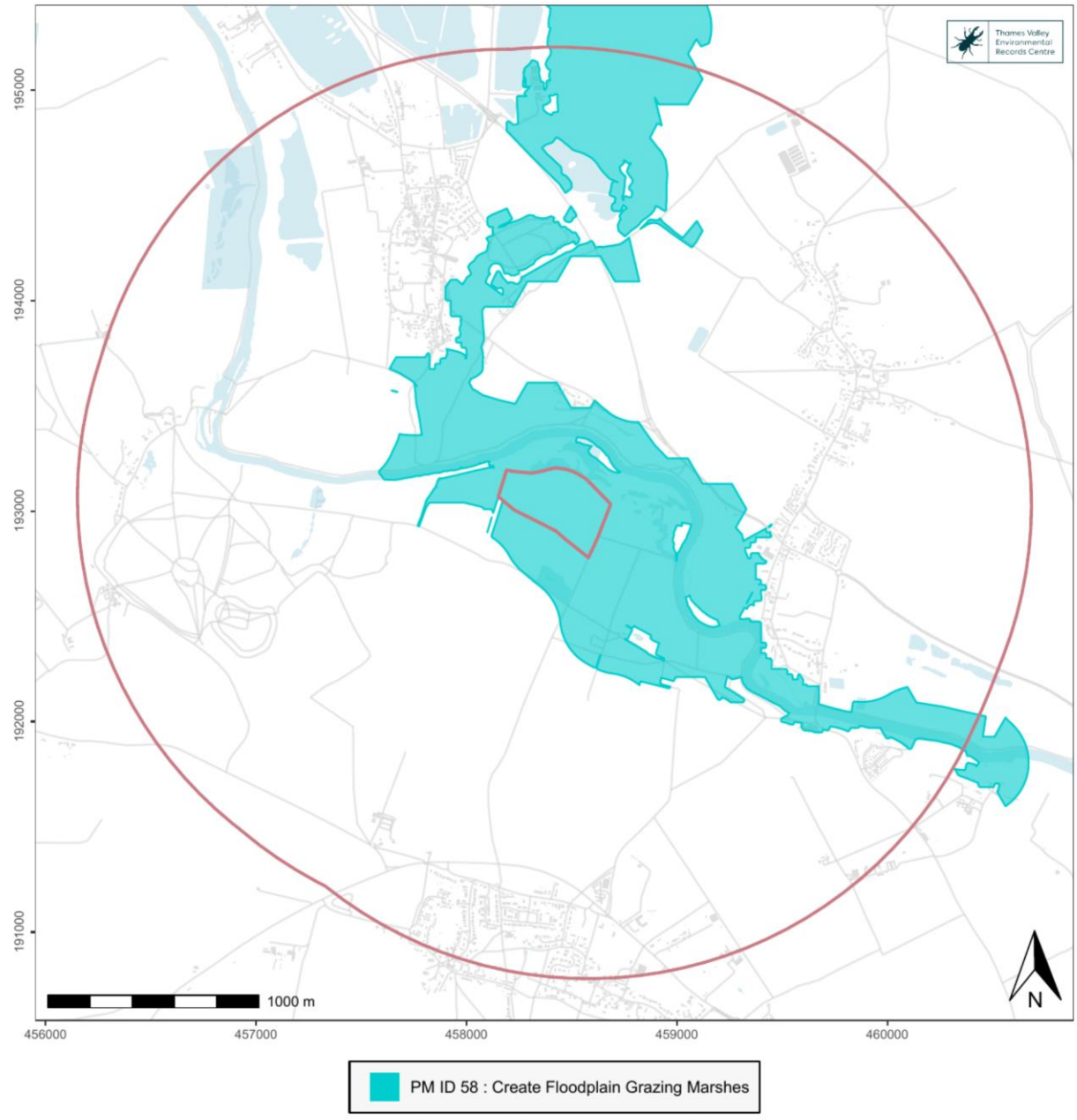
***Wider Benefits***

Undertaking grazing marsh creation in suitable locations can be beneficial for a variety of wider environmental benefits including: food production, recreation and leisure, aesthetic value, interaction with nature, sense of place, flood protection, erosion protection, water quality regulation, carbon storage, and pollination.

## ***Map***

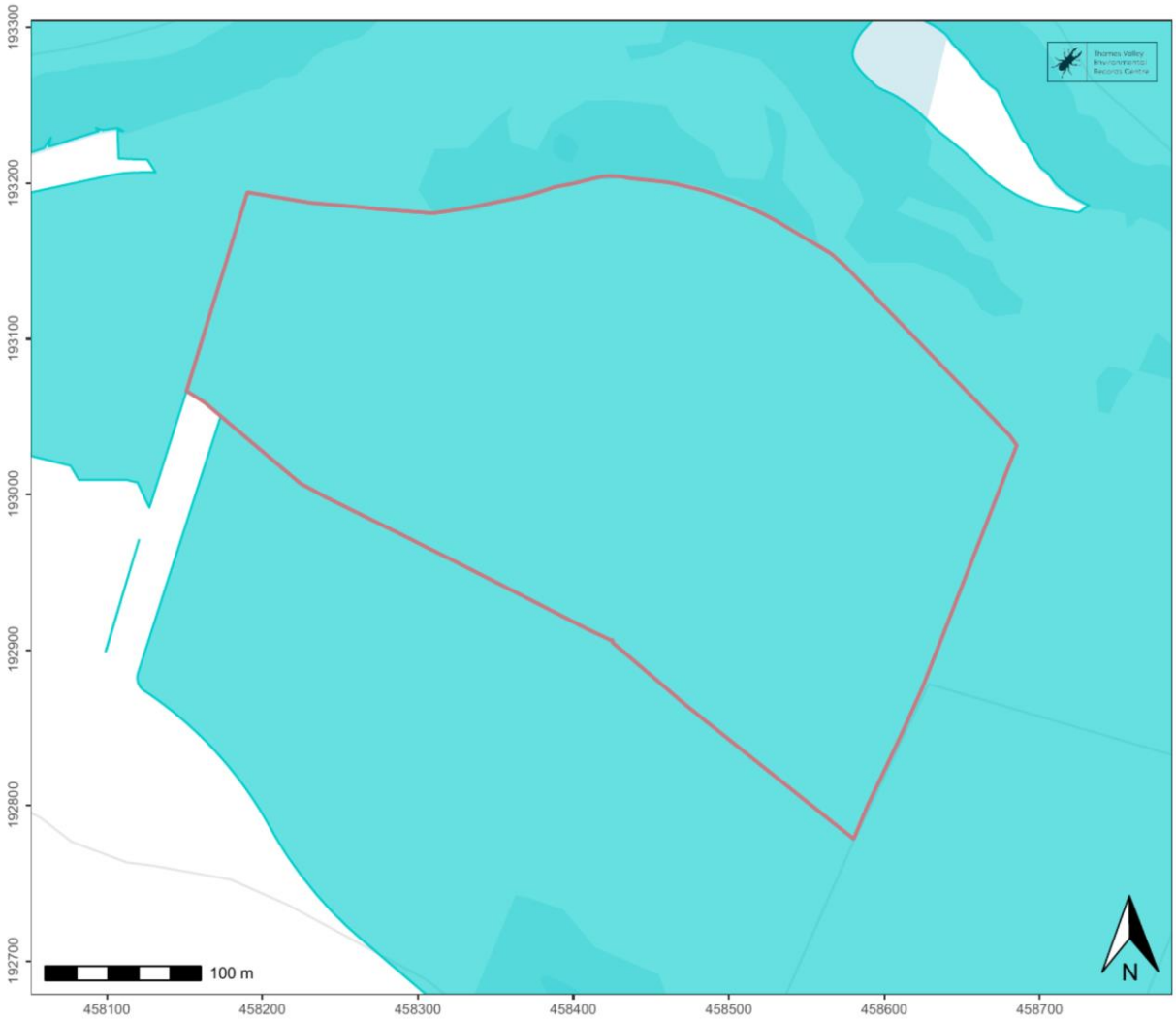
TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 58 : Create Floodplain Grazing Marshes
2km search area



## TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 58 : Create Floodplain Grazing Marshes
Site boundary



## Oxfordshire Potential Measure 54: Create Wetland Habitat Matrices

Part of a series of rivers, streams, ponds, standing water, and wetland habitat measures.

There is **12.83 ha** of Potential Measure ID 54: Create Wetland Habitat Matrices within your site boundary and **369.25 ha** within the 2km buffer.

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### *About This Habitat*

"Wetland are places where water and dry land meet - home to a wide range of wildlife, from dragonflies and damselflies to wading curlew and snipe; from carnivorous plants to flitting butterflies. The rain-drenched lands of the UK offer perfect conditions for the formation of wetlands.

The lives of animals, plants and people depend on wetlands being in a good condition. Healthy wetlands store carbon and slow the flow of water, cleaning it naturally and reducing flood risk downstream. They support an abundance of plant life, which in turn provide perfect shelter, nurseries and breeding grounds for wildlife.

Many wetlands are dynamic and if left alone, over long time spans, would develop into a different wetland type, or into woodland. However, the traditional management of wetlands stopped this process, allowing species that live in these areas to flourish and thrive. This included harvesting sedge and reed for thatch, and cutting and drying peat for fuel."

from The Wildlife Trusts

### *Description*

This mapped measure indicates areas for the creation of wetland habitats that contain a matrix of various habitat types suitable for the site. The aim of this measure is to create more new or restored high quality freshwater habitats in Oxfordshire.

### *Action*

Restore and enhance degraded or lost floodplain wetland habitats by restoring rivers to improve hydrological connectivity with floodplains, managing water levels where appropriate, and creating new habitats and features such as ponds, ditches, wet woodland, trees, hedges and more habitats suitable as part of a wetland matrix. Connect existing floodplain wetlands by the creation of new wetlands to act as stepping stones for wildlife and increase the overall habitat available for key wetland species.

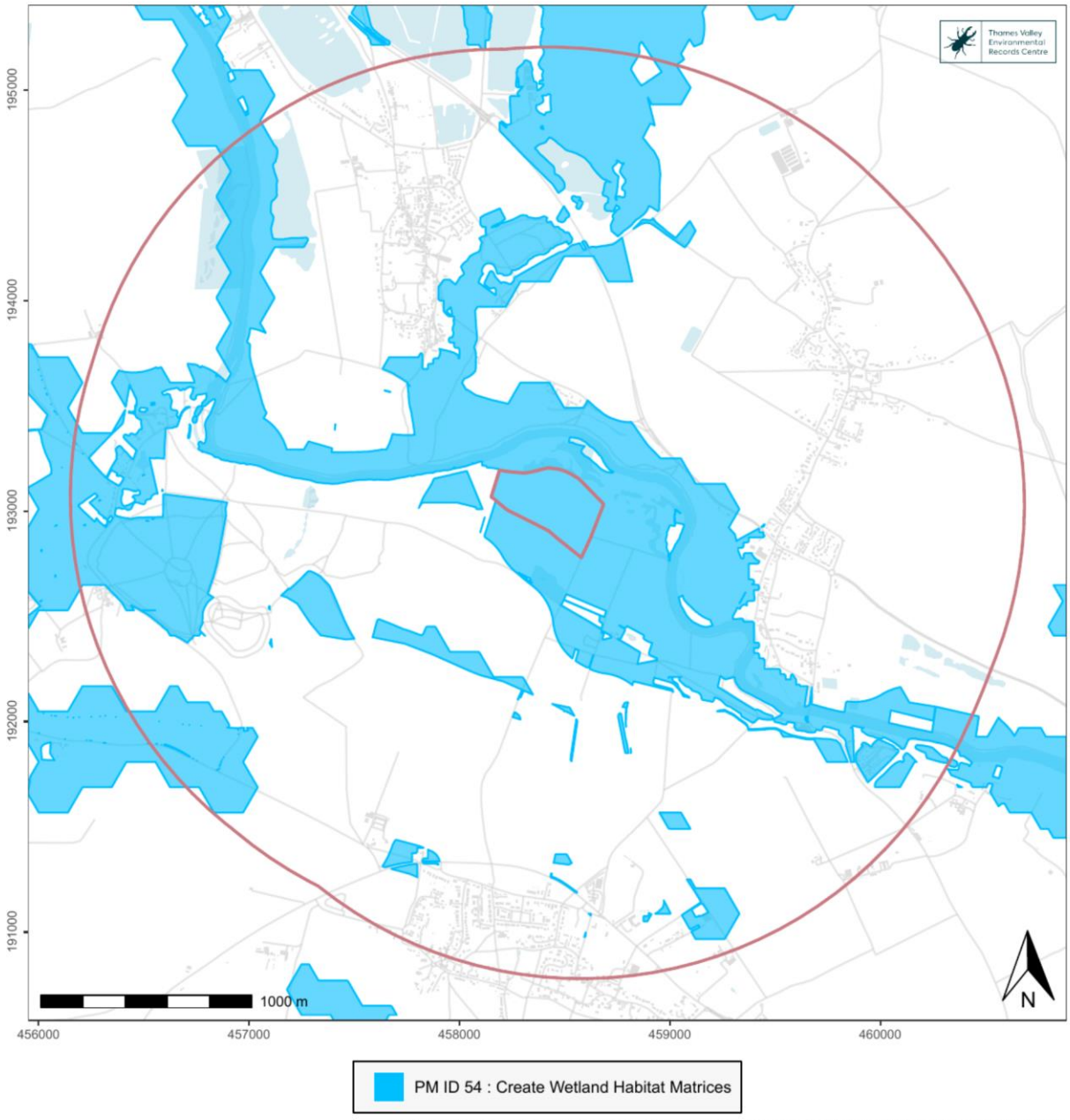
### *Wider Benefits*

Undertaking the creation of wetland habitat matrices in suitable locations can be beneficial for a variety of wider environmental benefits including: fish production, water supply, recreation and leisure, aesthetic value, interaction with nature, sense of place, flood protection, water quality regulation, carbon storage, cooling and shading, and pest control.

## ***Map***

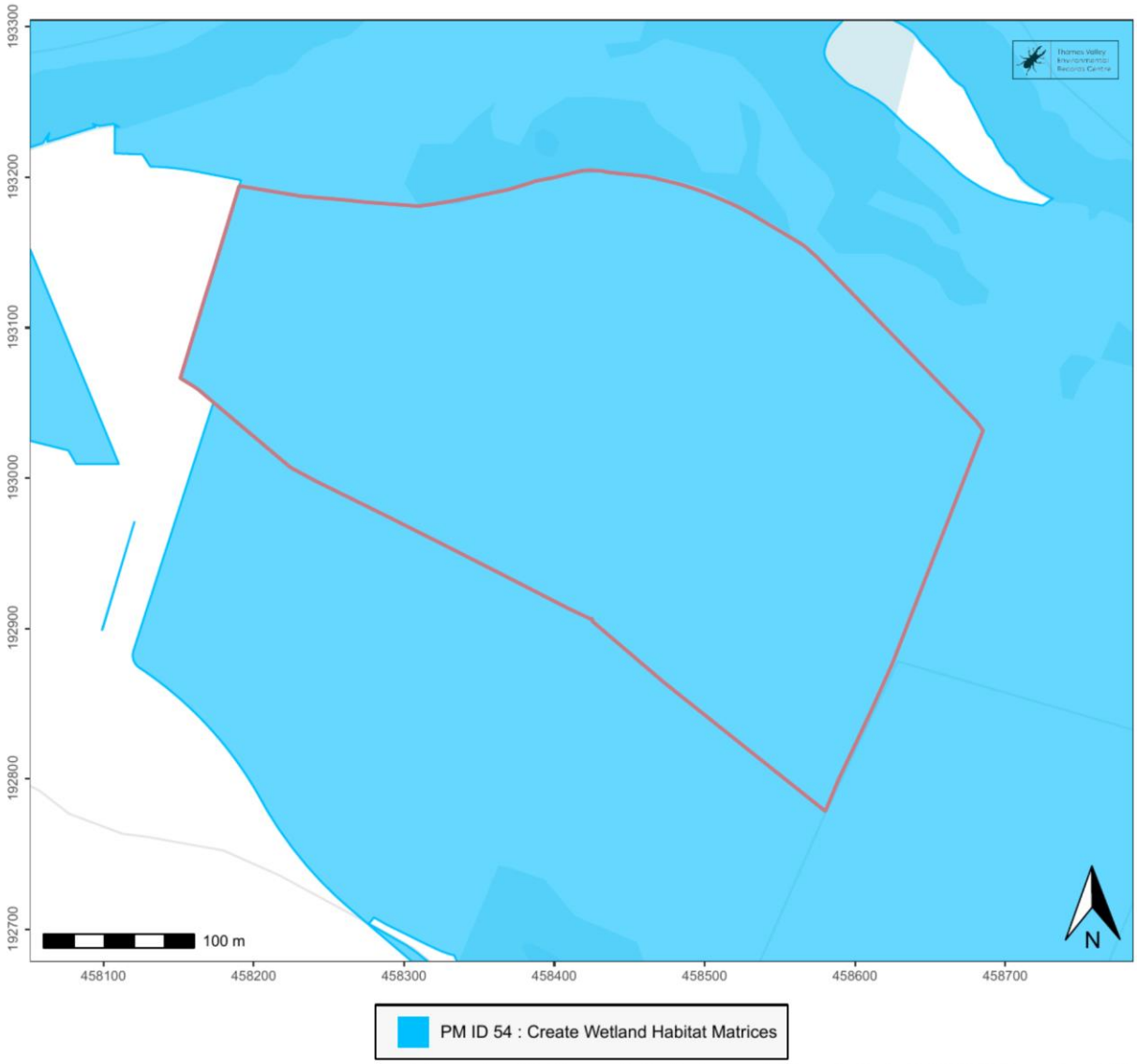
TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 54 : Create Wetland Habitat Matrices
2km search area



# TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 54 : Create Wetland Habitat Matrices
Site boundary



## Oxfordshire Potential Measure 55: Create Ponds

Part of a series of rivers, streams, ponds, standing water, and wetland habitat measures.

There is **12.78 ha** of Potential Measure ID 55: Create Ponds within your site boundary and **513.13 ha** within the 2km buffer.

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### *About This Habitat*

"A familiar feature of many field corners, village greens and gardens, ponds are generally small in size, ranging from one to twenty thousand square metres (or two hectares - about two thirds of the area of Buckingham Palace). Ponds are not connected to each other or to other water bodies – they are only fed by rainwater or groundwater.

One of the best ways of bringing more wildlife into an area, ponds can be very diverse, supporting similar aquatic plants to lakes, and even more large invertebrates than rivers. The best ponds for wildlife have shallow margins with a fringe of vegetation and nearby plant cover for amphibians and insects with terrestrial life stages.

Unmaintained, field ponds may only last around 100 years, as they gradually fill with silt - fine, sludgy mud that gets swept in by rain and settles at the bottom. Small ponds can be completely transformed in this way by a single spell of heavy rain."

from The Wildlife Trusts

### *Description*

This mapped measure indicates areas for the creation of new, varied ponds in suitable locations across all habitat types to increase biodiversity and create more clean water habitats. The aim of this measure is to create more new or restored high quality freshwater habitats in Oxfordshire.

### *Action*

Creating ponds in areas away from pollution offers one of the quickest ways to bring clean water back into the landscape (FHT). Create ponds that are varied in structure, sun exposure, locations, and shape. Within each pond, create a variety of depths and types of pond edges including a gradual, shallow bank to allow animals into and out of the pond. Allow plants to grow naturally at pond edges with piles of stone, deadwood, and/or areas of longer vegetation near to ponds. When creating multiple ponds, create them at different points in time so that landscapes have older ponds, younger ponds, and ponds that are allowed to dry/die out. Prevent ponds becoming overgrown by tall, dominant reeds and sedges. Maintain these ponds to allow a variety of sun exposure with areas of no shade (especially on the southern side of the pond) and include deadwood within ponds. See further guidance here.

FHT recommend creating 10 new 'priority ponds' per every 100 hectares of habitat creation. Across Oxfordshire, ponds offer great value to biodiversity including exemplar habitats at gravel pits sites and sites like Otmoor. Pond and wetland creation can also be designed to aid the management of water through the county offering wider benefits to people and farm businesses (preventing flooding and storing water).

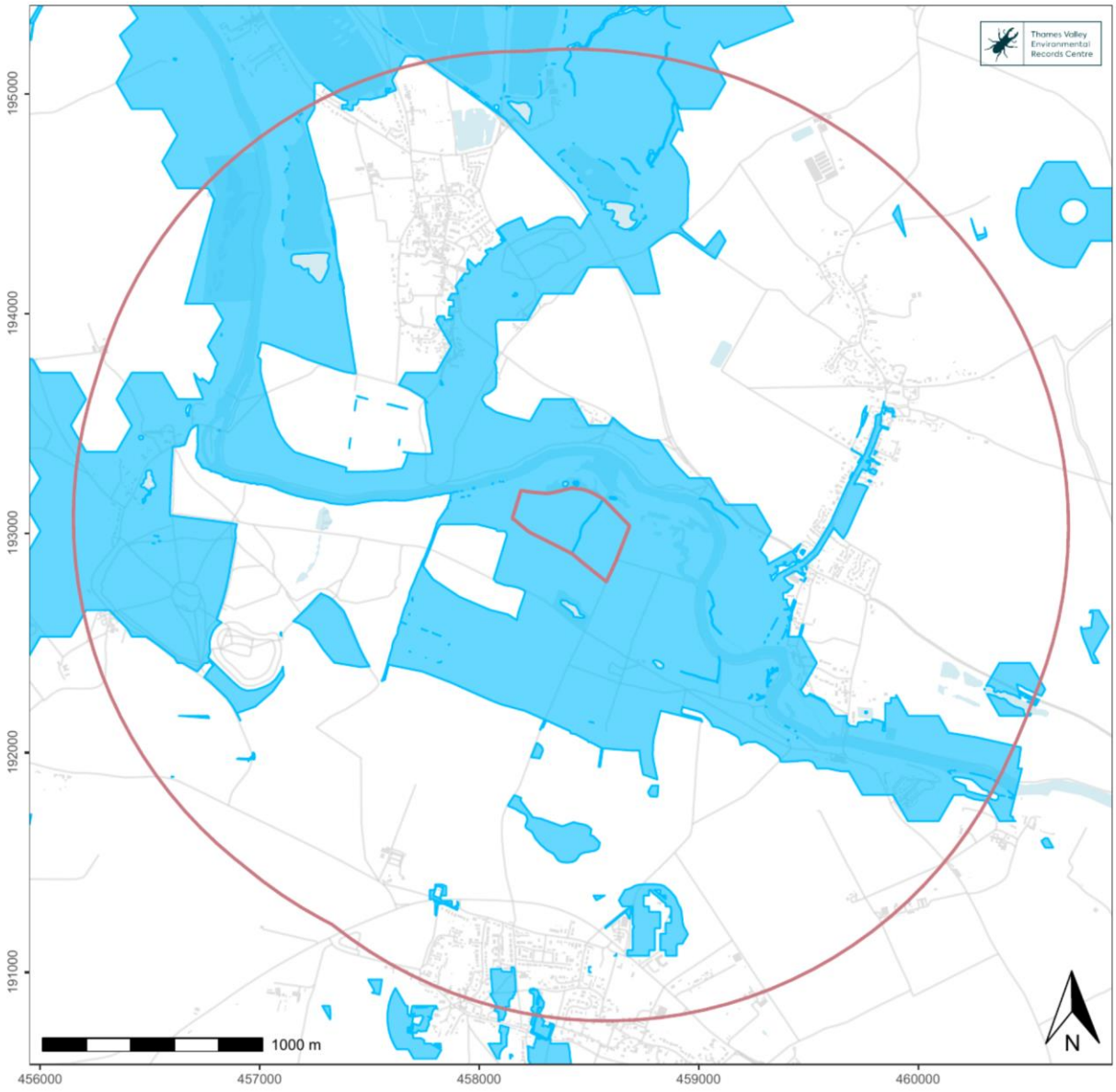
***Wider Benefits***

Undertaking pond creation in suitable locations can be beneficial for a variety of wider environmental benefits including: fish production, water supply, recreation and leisure, aesthetic value, interaction with nature, sense of place, flood protection, water quality regulation, carbon storage, cooling and shading, and pest control.

## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 55 : Create Ponds
2km search area



## TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 55 : Create Ponds
Site boundary



Date:2026-01-16

## Oxfordshire Potential Measure 6: Create Neutral Grassland

Part of a series of grassland and scrub habitat measures.

There is **7.46 ha** of Potential Measure ID 6: Create Neutral Grassland within your site boundary and **92.94 ha** within the 2km buffer.

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### *About This Habitat*

"Neutral grassland is a widespread and relatively common grassland type found across much of the UK, particularly in lowland areas. Typical locations include road verges, railway embankments, and unmanaged pastures. It encompasses a range of grassland communities, generally distinguished by their dominant grass species. These habitats are usually found on neutral soils, and are characterised by a moderate plant species diversity, typically ranging from 9 to 15 species per square metre.

In terms of ecological value, neutral grassland sits midway between high-quality habitats - such as species-rich Lowland Meadows (a Priority Habitat) - and more species-poor habitats, like intensively managed amenity grassland or mown lawns. It supports a moderate range of invertebrates, including bees, moths, and butterflies, and provides foraging and nesting opportunities for a variety of birds, as well as habitat for amphibians and small mammals."

from Biodiversity Units

### *Description*

This mapped measure indicates areas for the creation of neutral grassland. The aim of this measure is to create new areas of species-rich grassland (including scrub and mosaic habitats) in Oxfordshire that are managed to support biodiversity and to achieve a good ecological condition.

### *Action*

Existing semi-improved or modified grasslands can be diversified by over seeding following site preparation. Where appropriate, arable areas can also be reverted to wildflower grassland through seeding, following site preparation. Plants grown as plugs can be used for species that do not spread well as seed. Use seed or plug sources of local provenance and similar soil conditions. Green hay from similar wildflower meadows can be spread as an alternative to seed. See management guidance and handbooks for further details. Follow management guidance and handbooks to create new areas of neutral grassland habitat including ground preparation on suitable soils. Test soils to determine if conditions would be suitable for lowland meadow creation, otherwise aim for species-rich neutral grasslands.

### *Wider Benefits*

Undertaking neutral grassland creation in suitable locations can be beneficial for a variety of wider environmental benefits including: aesthetic value, erosion protection, water quality regulation, carbon storage, pollination, and pest control.

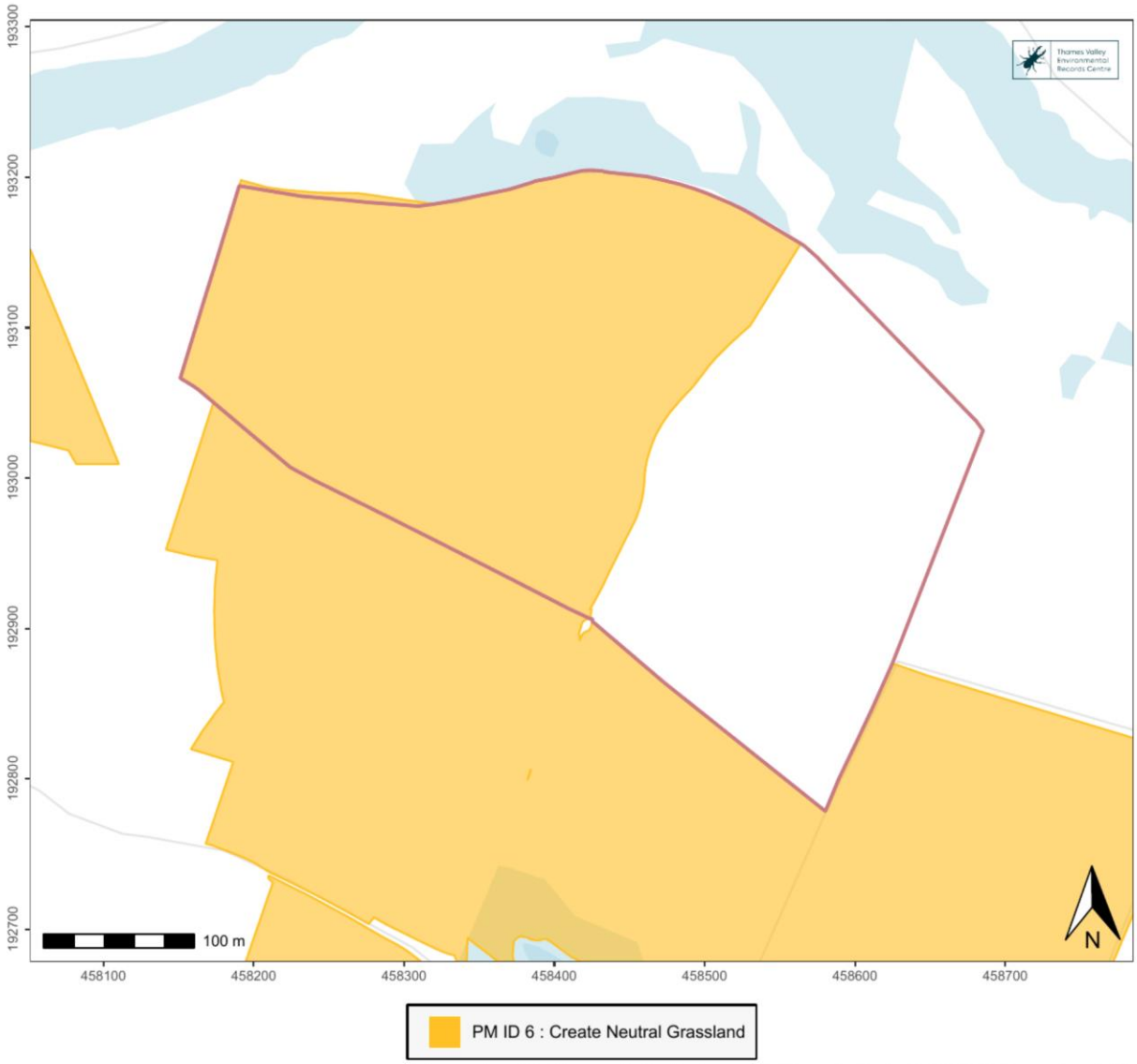
## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 6 : Create Neutral Grassland
2km search area

# TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 6 : Create Neutral Grassland
Site boundary



## Oxfordshire Potential Measure 40: Create Wet Woodland

Part of a series of woodland measures.There is **3.11 ha** of Potential Measure ID 40: Create Wet Woodland within your site boundary and **236.96 ha** within the 2km buffer.

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### *About This Habitat*

"Wet woods occur on soils that are often or seasonally wet, either because of flooding, or because of the land form and soil type. Find them along streams and rivers; on floodplains and at the edges of lakes; in peaty hollows; and at the margins of fens, bogs and mires. These woodland types can occur as small pockets within larger, drier woodlands.

Some wet woodlands can be ancient, while others can be more recent in origin. Both are often very valuable for wildlife. Ancient sites support species like remote sedge, opposite-leaved golden-saxifrage, wood horsetail and yellow pimpernel. Wet woodlands include marsh marigold, meadowsweet, yellow flag, bittersweet nightshade, and wild redcurrant and blackcurrant bushes. High humidity supports the growth of mosses and ferns."

from Woodland Trust

### *Description*

This mapped measure indicates areas for the creation of new areas of wet woodland along rivers, river corridors, and riparian land, where appropriate. The aim of this measure is to create new, diverse woodlands in Oxfordshire that mature into good ecological condition and are managed to support biodiversity.

### *Action*

In suitable wet areas such as river corridors, spring lines, and riparian land, plant (or allow the growth of) a variety of wet woodland trees along river corridors or as areas of wet woodland. Plan to create and manage open areas within the woodland and consider planting willow and alder species. If water flows have previously been diverted away from the woodland, or if water levels were artificially lowered, seek advice about opportunities to restore water flows or groundwater levels to rewet suitable woodlands and/or allow wet woodland to develop. Wet woodland creation can offer benefits to help 'slow the flow' of water during high rainfall flood events (helping to mitigate flooding) and can regulate and improve water quality across the landscape.

If the new woodland is isolated from other woodlands, consider introducing locally sourced field-layer flora appropriate to the site conditions (this must be legally obtained and appropriate to the woodland).

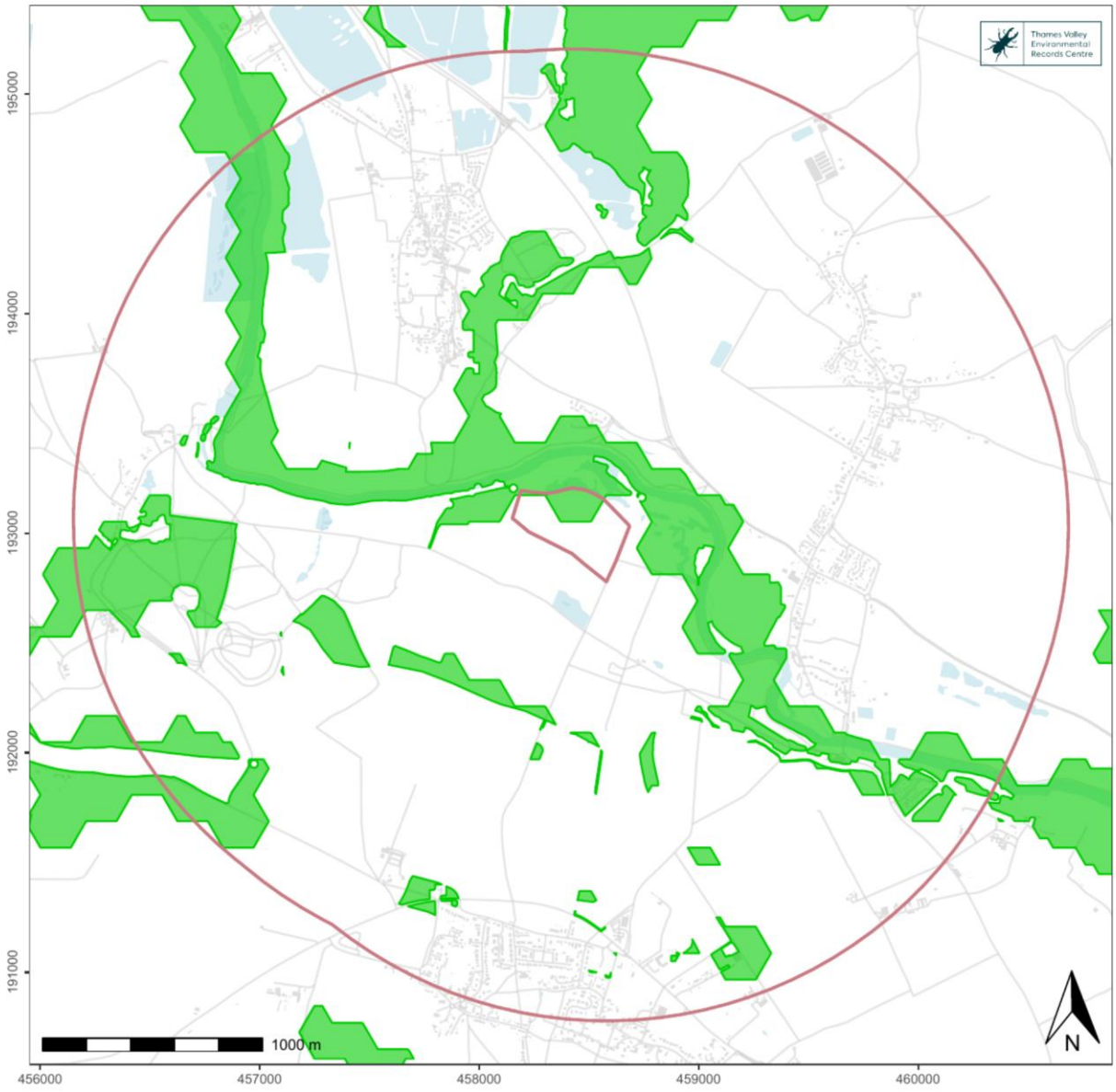
### *Wider Benefits*

Undertaking wet woodland creation in suitable locations can be beneficial for a variety of wider environmental benefits including: food production (wild), wood production, recreation and leisure, aesthetic value, interaction with nature, sense of place, flood protection, erosion protection, water quality regulation, carbon storage, air quality regulation, cooling and shading, noise reduction, pest control, and pollination.

## ***Map***

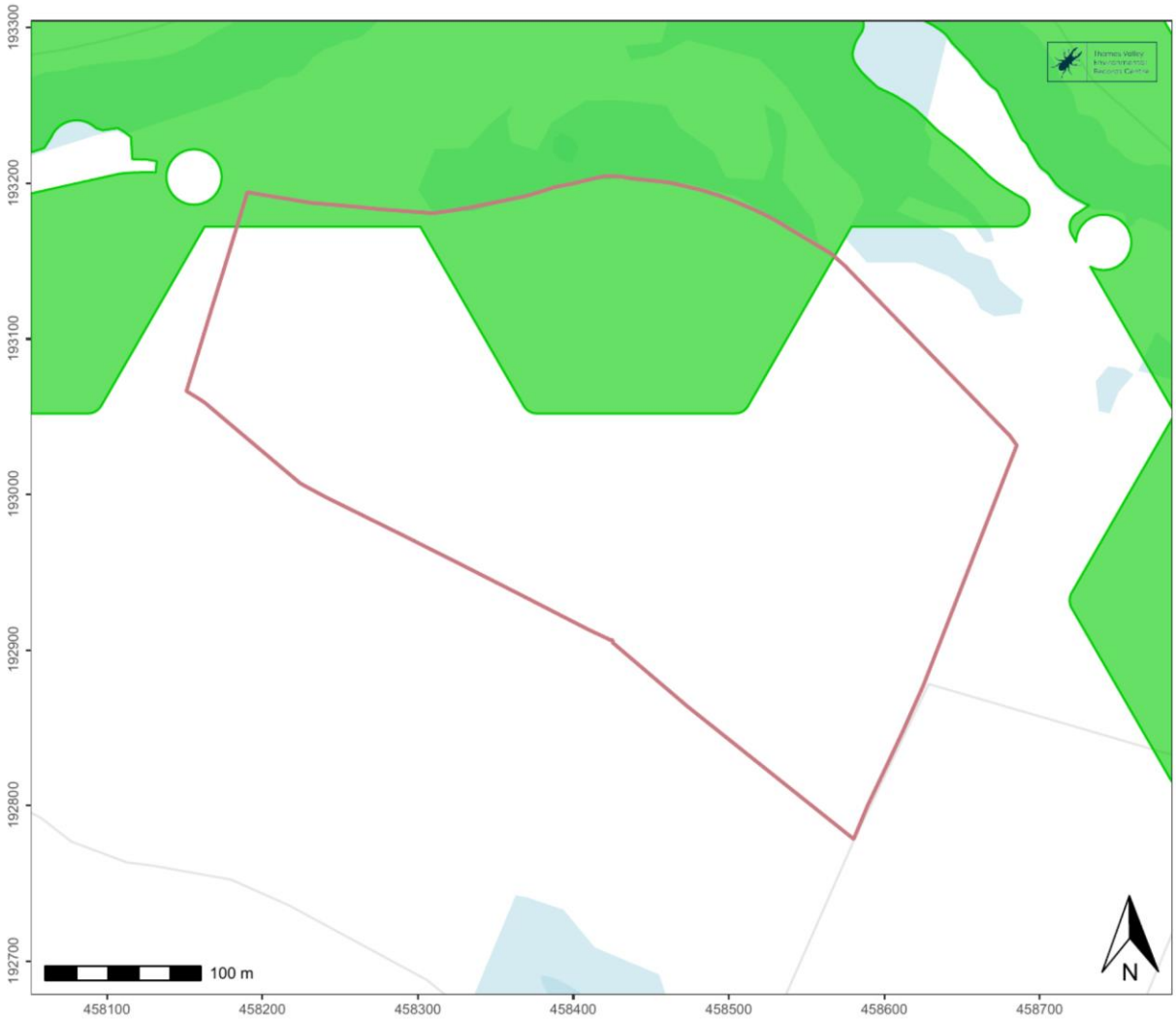
TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 40 : Create Wet Woodland
2km search area



## TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 40 : Create Wet Woodland
Site boundary




PM ID 40 : Create Wet Woodland

## Oxfordshire Potential Measure 42: Restore & Manage Rivers & Riparian Areas

Part of a series of rivers, streams, ponds, standing water, and wetland habitat measures.There is **2.63 ha** of Potential Measure ID 42: Restore & Manage Rivers & Riparian Areas within your site boundary and **247.65 ha** within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"A river is a moving body of water - usually freshwater - that flows from its source on high ground, across land, and then into another body of water, which could be a lake, the sea, an ocean or even another river. They're often surrounded by other 'riverine' wetlands like reedbeds, estuaries and freshwater marshes. A stream (also called a brook or a creek) is a natural flow of water that follows a more temporary path that is usually not in a valley. Water quality often determines which species will be supported in a particular river or stream. Temperature, velocity, oxygen content, mineral content, and muddiness are all factors."

from The Wildfowl & Wetlands Trust

### *Description*

This mapped measure indicates areas for restoring river diversity and managing rivers and their riparian (riverside) habitats to achieve good ecological condition that supports species. The aim of this measure is to enhance and manage existing freshwater habitats in Oxfordshire to achieve good ecological condition and support biodiversity through clean, healthy, and plentiful water.

### *Action*

This refers to the restoration of river habitat diversity to support a wide range of species. Undertake restoration work to restore structurally diverse rivers and riverside habitats (including banks and marginal vegetation) which support a wide range of species. Techniques to enhance and restore river physical habitat condition and biodiversity will be site-specific and will depend on the degree of modification and the ecological context, as well as river typology. Expert advice should be sought (e.g. from the Environment Agency and local catchment partnerships), and appropriate permits obtained if required.

Techniques to enhance river condition and biodiversity vary and will be site-specific. The techniques may include raising channel beds of rivers to reconnect with their floodplain and to form a habitat matrix of wetlands, riparian woodlands and wet meadow wildflower grasslands, all of which can buffer and reduce the impact of pollution into rivers. This may be achieved through a variety of interventions which could range in intensity from the use of machinery and import of gravels, through to establishing ecosystem engineer species, in this case beavers, which if re-established in the county have a unique ability to manipulate riparian habitats. Consider de-culverting, removing artificial banks, and techniques to naturalise modified watercourse channels. Within rivers, improve connectivity especially for fish, by the removal of barriers to fish passage (and thereby improving instream habitat), or where this is not possible provide fish bypass channels or other fish pass solutions to allow fish to migrate and utilise upstream habitats. Seek expert advice on the most appropriate fish passage solutions.

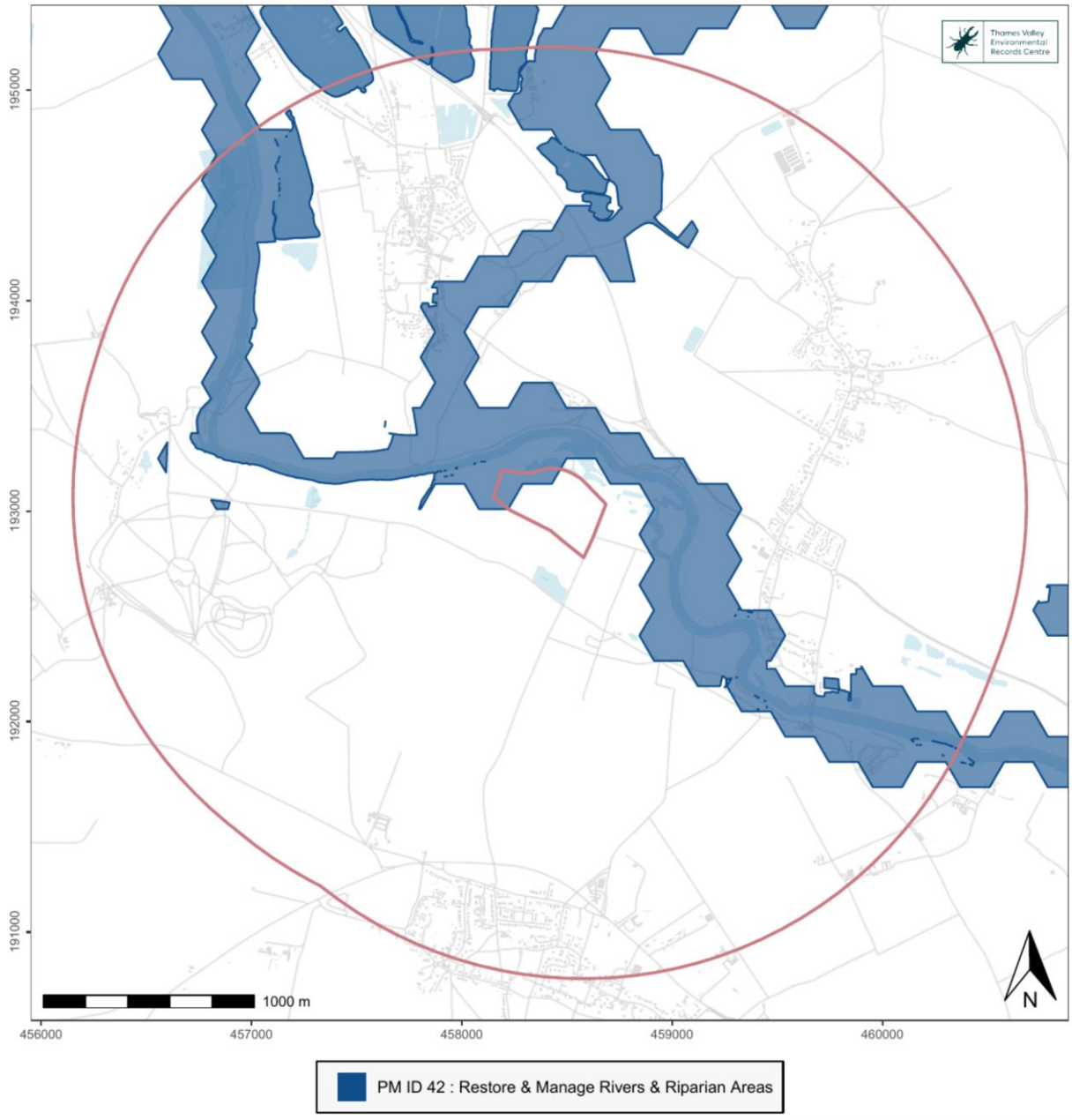
***Wider Benefits***

Undertaking river & riparian area restoration and management in suitable locations can be beneficial for a variety of wider environmental benefits including: fish production, water supply, recreation and leisure, aesthetic value, interaction with nature, sense of place, water quality regulation.

## ***Map***

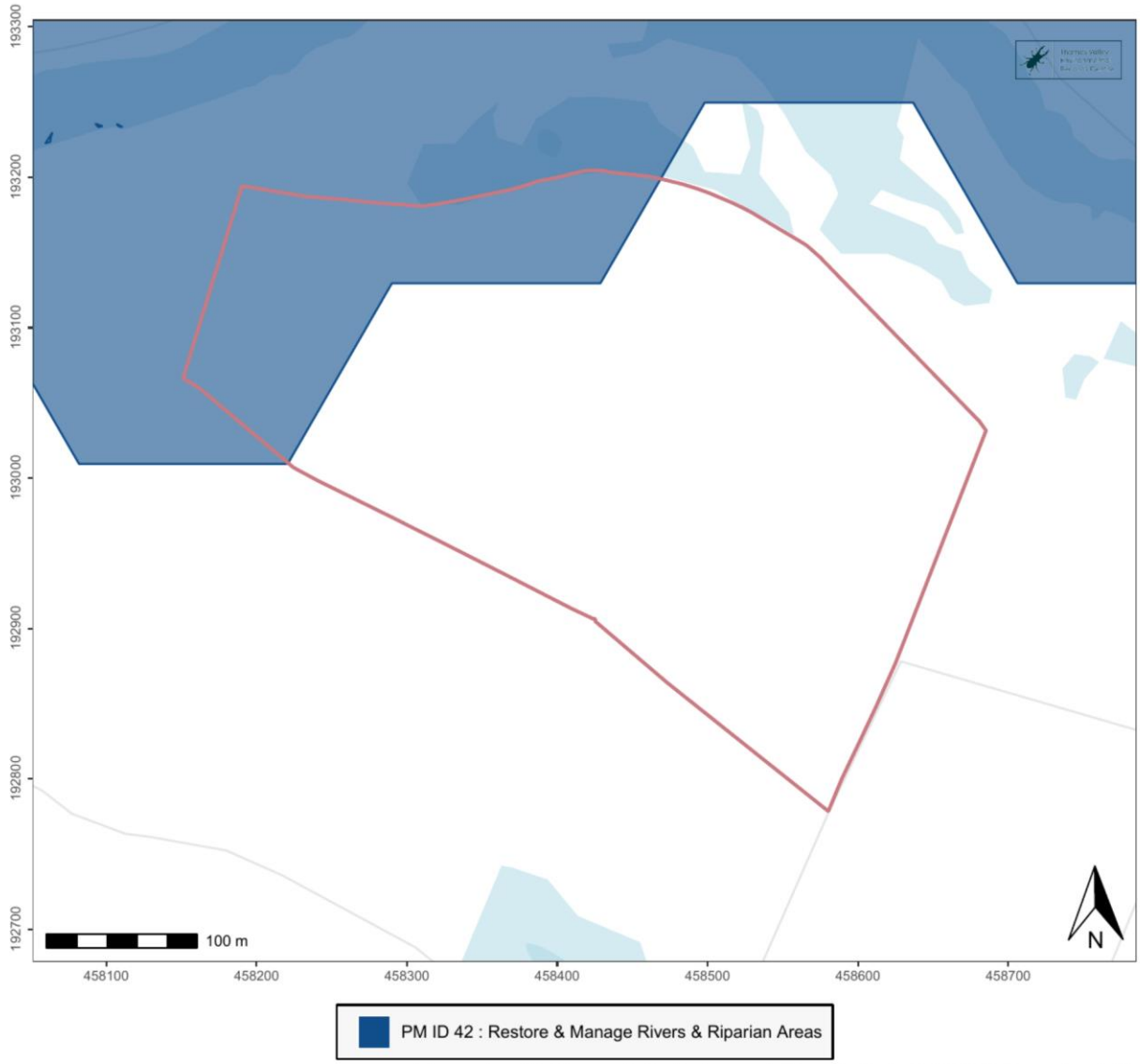
TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 42 : Restore & Manage Rivers & Riparian Areas
2km search area



# TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 42 : Restore & Manage Rivers & Riparian Areas
Site boundary



## Oxfordshire Potential Measure 30: Create Grassland & Woodland Matrix Habitats

Part of a series of mixed habitat measures, including measures for wood pasture, parkland, orchards, and open mosaic habitats.

There is **1.54 ha** of Potential Measure ID 30: Create Grassland & Woodland Matrix Habitats within your site boundary and **80.48 ha** within the 2km buffer.

Back to Overview of Habitat Measures table

### *Description*

This mapped measure indicates areas for the creation of new areas of habitat that contain a matrix of habitat types including small woodland patches, scattered trees, scrub, and grassland. The aim of this measure is to create more areas of mixed habitat in Oxfordshire to support biodiversity.

### *Action*

Create new areas of habitat that include (but are not limited to) a mix of trees, scrub, and grassland. This could be achieved through tree planting, natural regeneration techniques, or other options that achieve the end result. This action is often suitable near woodland edges to create a transition habitat between woodland and grassland. Creating these areas can support both woodland and grassland species. New large areas of this kind of mosaic habitat can also be created by practicing light grazing across a large area and allowing natural processes to take place. The species richness of the grassland components can be increased using species-rich grassland creation techniques such as overseeding, spreading green hay, and/or plug planting. Create and manage scrub in a manner that complements the site and local species. Where appropriate, allow varied pockets of scrub to grow up at different points in time to create a variety of ages, retaining any older or old scrub which supports particular invertebrate communities. See this guide on scrub management.

### *Wider Benefits*

Undertaking grassland and woodland matrix creation in suitable locations can be beneficial for a variety of wider environmental benefits including: food production, wood production, recreation and leisure, aesthetic value, sense of place, carbon storage, air quality regulation, flood regulation, erosion regulation, water quality regulation, cooling and shading, pest control, and pollination.

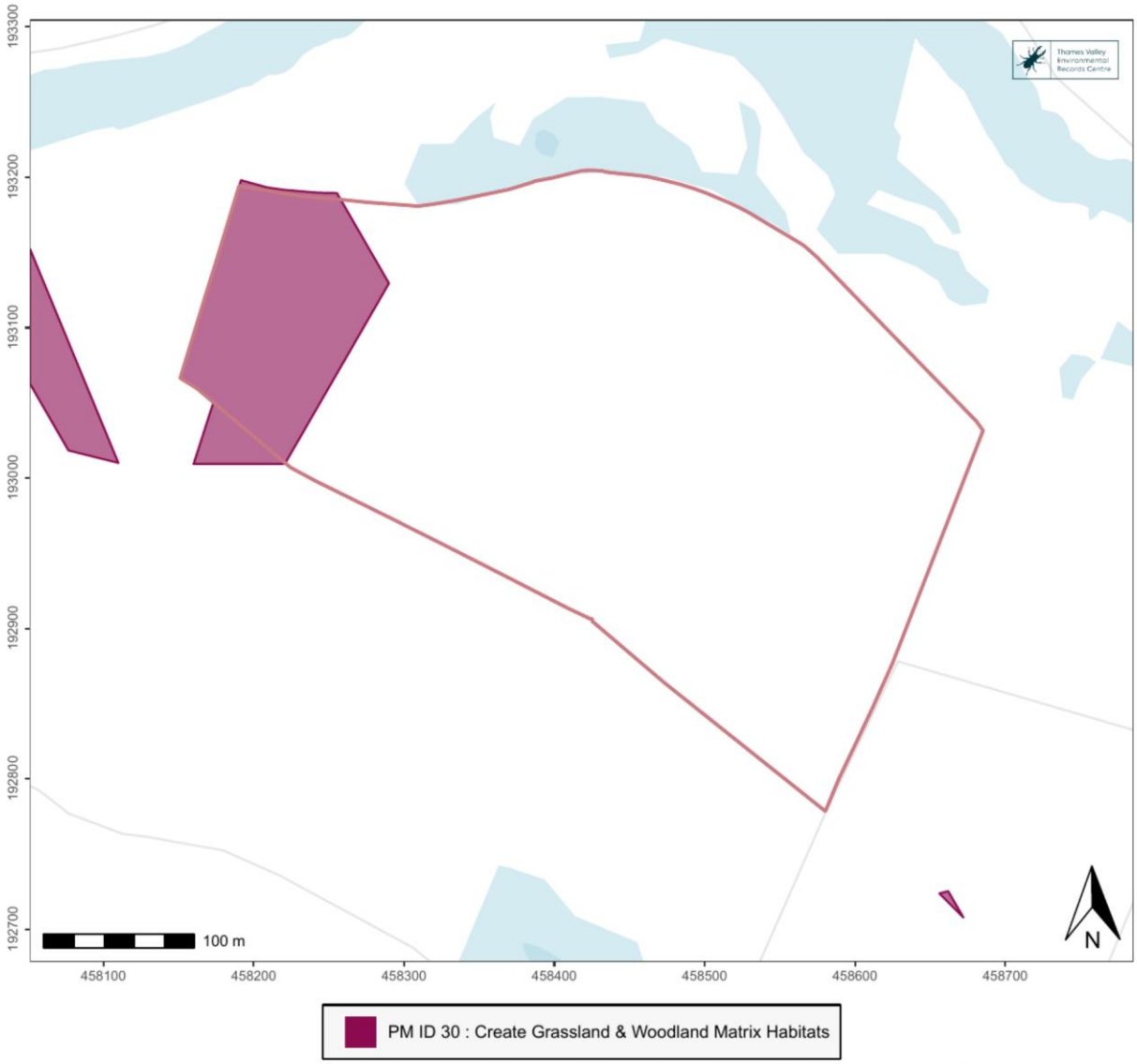
## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 30 : Create Grassland & Woodland Matrix Habitats
2km search area

# TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 30 : Create Grassland & Woodland Matrix Habitats
Site boundary



## Oxfordshire Potential Measure 46: Enhance Ponds

Part of a series of rivers, streams, ponds, standing water, and wetland habitat measures.

There is **0.06 ha** of Potential Measure ID 46: Enhance Ponds within your site boundary and **6.77 ha** within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"A familiar feature of many field corners, village greens and gardens, ponds are generally small in size, ranging from one to twenty thousand square metres (or two hectares - about two thirds of the area of Buckingham Palace). Ponds are not connected to each other or to other water bodies – they are only fed by rainwater or groundwater.

One of the best ways of bringing more wildlife into an area, ponds can be very diverse, supporting similar aquatic plants to lakes, and even more large invertebrates than rivers. The best ponds for wildlife have shallow margins with a fringe of vegetation and nearby plant cover for amphibians and insects with terrestrial life stages.

Unmaintained, field ponds may only last around 100 years, as they gradually fill with silt - fine, sludgy mud that gets swept in by rain and settles at the bottom. Small ponds can be completely transformed in this way by a single spell of heavy rain."

from The Wildlife Trusts

### *Description*

This mapped measure indicates areas for the enhancement of existing ponds by undertaking sensitive management and restoration of ponds and pond complexes to improve biodiversity and water quality. The aim of this measure is to enhance and manage existing freshwater habitats in Oxfordshire to achieve good ecological condition and support biodiversity through clean, healthy, and plentiful water.

### *Action*

Manage ponds through low intervention techniques that cause minimal damage to local species and where possible, incorporate grazing to manage vegetation. Pond management and pond restoration is very individual to the type, age, and structure of existing ponds. Through management, aim to retain and enhance existing positive features of the particular pond. Further management techniques should aim to create diversity in the pond structure, depths, edges, shape, vegetation growth, and areas of shade, often keeping the south side more open and sunny. Techniques also depend on any local species that rely on the pond. It is helpful to biodiversity to create habitat buffers around suitable existing ponds. The buffer areas can contain varied vegetation to offer cover for species. Additionally, consider incorporating deadwood into and around existing ponds to support biodiversity. Aim to maintain or create a buffer of low-intensity land use around the pond as large as possible/appropriate aiming to balance the buffer size with other land-use in the area. For 'priority ponds', Freshwater Habitats Trust advise a buffer of 50 metres (or more) where possible. See guidance about how to manage existing ponds here.

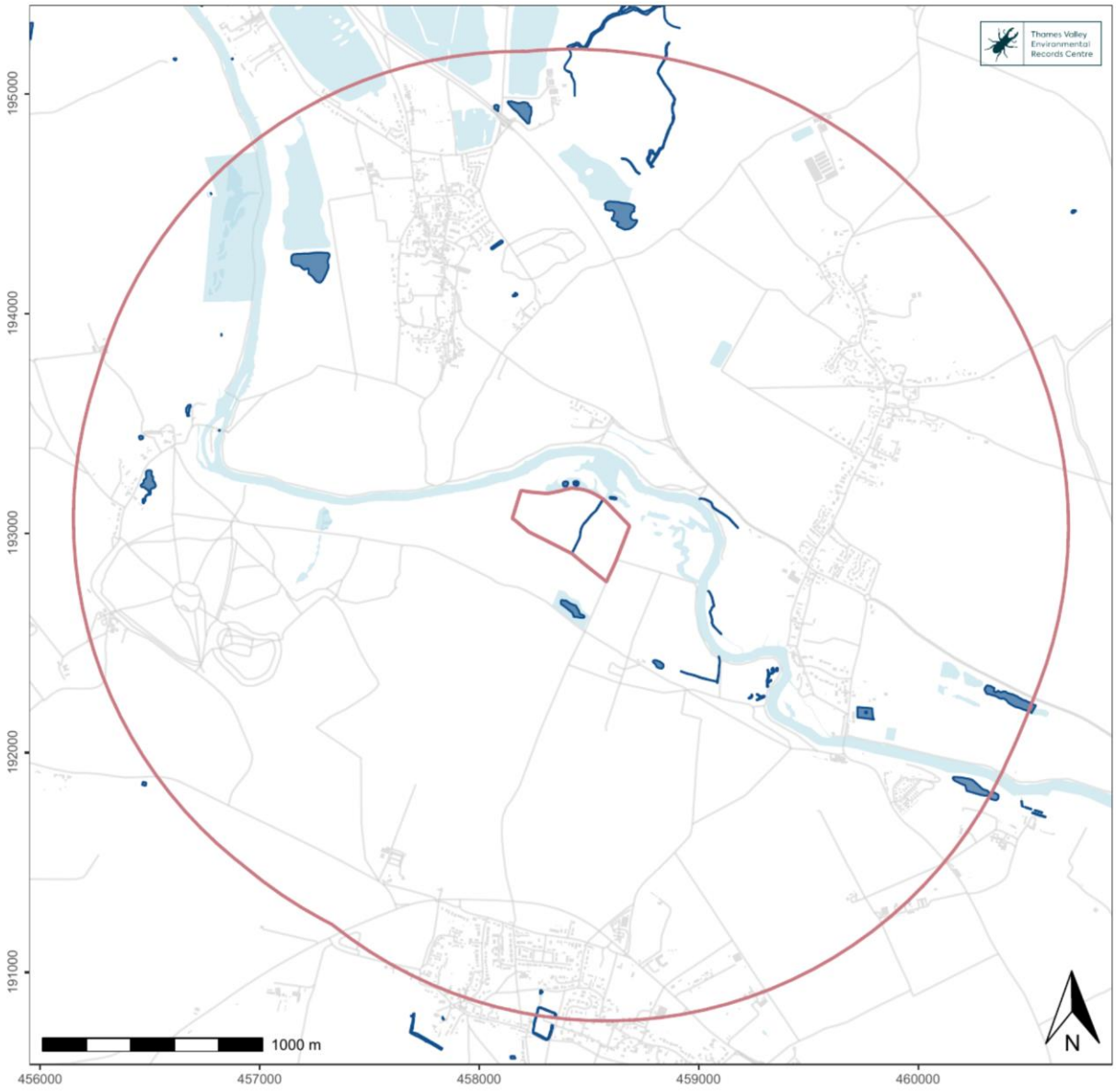
***Wider Benefits***

Undertaking pond enhancement in suitable locations can be beneficial for a variety of wider environmental benefits including: fish production, water supply, recreation and leisure, aesthetic value, interaction with nature, sense of place, water quality regulation.

***Map***

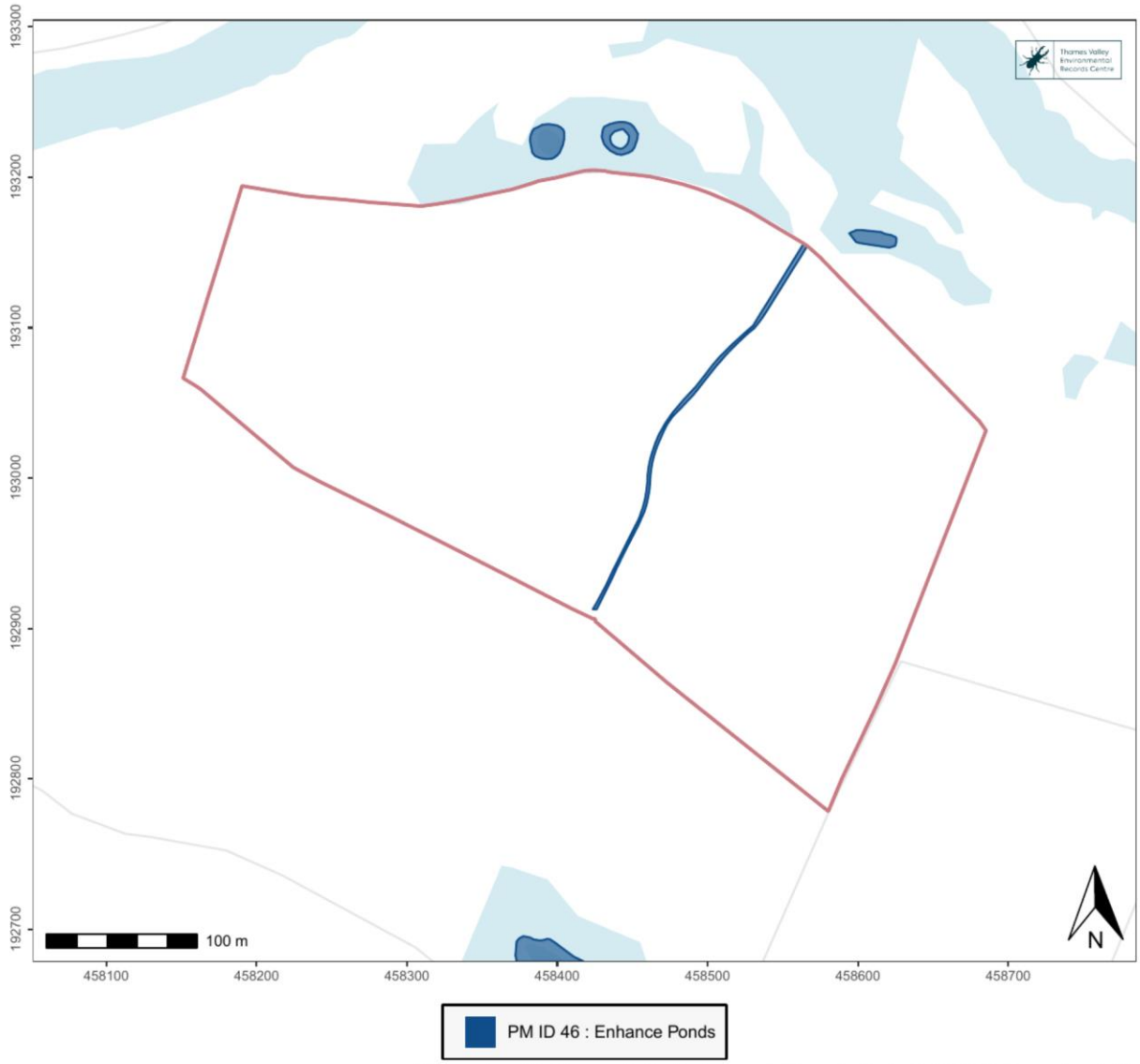
TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 46 : Enhance Ponds
2km search area



# TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 46 : Enhance Ponds
Site boundary



## Oxfordshire Potential Measure 33: Enhance Woodland

Part of a series of woodland measures.There is **56.58 ha** of Potential Measure ID 33: Enhance Woodland within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"The term woodland encompasses a diverse group of habitats that can be rich in wildlife. They are a key habitat for many invertebrates, plants, birds, mammals and other species groups. Woodlands are also incredibly useful habitats, for instance by providing flood protection by holding back water in the soil, sequestering carbon dioxide and reducing local temperatures. They also help reduce soil erosion and regulate weather patterns, such as local rainfall and temperature. Woodland may also be beneficial to our health, as it's thought that spending time in forests decreases blood pressure, reduces stress levels and boosts your immune system. However, studies are still ongoing into the validity of these effects.

The types of woodland habitat include, but are not limited to, ancient, broadleaved, coniferous, mixed and wet woodland, as well as temperate rainforest, Caledonian forest, wood pastures and urban woodland. Each can have defining criteria such as plant types, soil moisture levels, humidity levels and age. There are also semi-natural and plantation woodlands, which are classified based on the percentage of planted trees. There are several indicator species used to determine the type of woodland habitats, such as the violet click beetle (Limoniscus violaceus), which rely exclusively on ancient decaying beech and ash trees."

from NHBS

### *Description*

This mapped measure indicates areas for the enhancement of existing woodlands to achieve a diverse structure and good ecological condition, suitable for the woodland type, age, and nearby species. The aim of this measure is to enhance and manage existing woodlands to achieve structural diversity and good ecological condition, enabling woodlands to act as a rich source of biodiversity for wildlife to disperse across the landscape.

### *Action*

Create and implement a management plan for existing woodlands that include strategies to enhance biodiversity and ecological condition. Include plans for managing older trees, planning for succession by younger trees, enhancing genetic diversity within trees and shrubs to combat pests and disease, specific actions to support local wildlife, and actions to manage unsustainable populations of invasive species.

Enhancement work should aim to achieve healthy woodlands that have a diversity of tree ages, woodland structure, woodland edges, rides, glades, and ground flora. Aim to have shrub and scrub species planted or growing around the edges of the woodland perimeter and in open areas within the woodland (if appropriate to the site's flora and fauna).

Create and manage rides and glades within woodlands to increase light penetration to the ground in suitable locations and achieve wide, open areas with zones that achieve a variety of shade and

ground cover. Avoid overshading the ground flora and allow periodic disturbance along rides to support ground flora to set seeds (can be achieved through time-limited, controlled grazing by cattle/horses). Position rides and glades to encourage greater continuity and connectivity of grassland and grassland edge habitats. Avoid compacting or waterlogging the soil to retain important fungal networks. Along woodland edges, create buffer areas of grassland margins with scrub transition areas where suitable for the area.

Consider using areas affected by significant diseases to create glades and open spaces within woodlands. Create, retain, and mange ponds and areas of water within woodlands aiming to achieve greater continuity and connectivity of water corridors across habitats. Consider rewetting woodlands, where appropriate by blocking drainage which can support invertebrate populations and provide more food for insectivorous birds. See woodland management toolkits, advice, and the UK Forestry Standard to better understand specific requirements that may apply to your woodland.

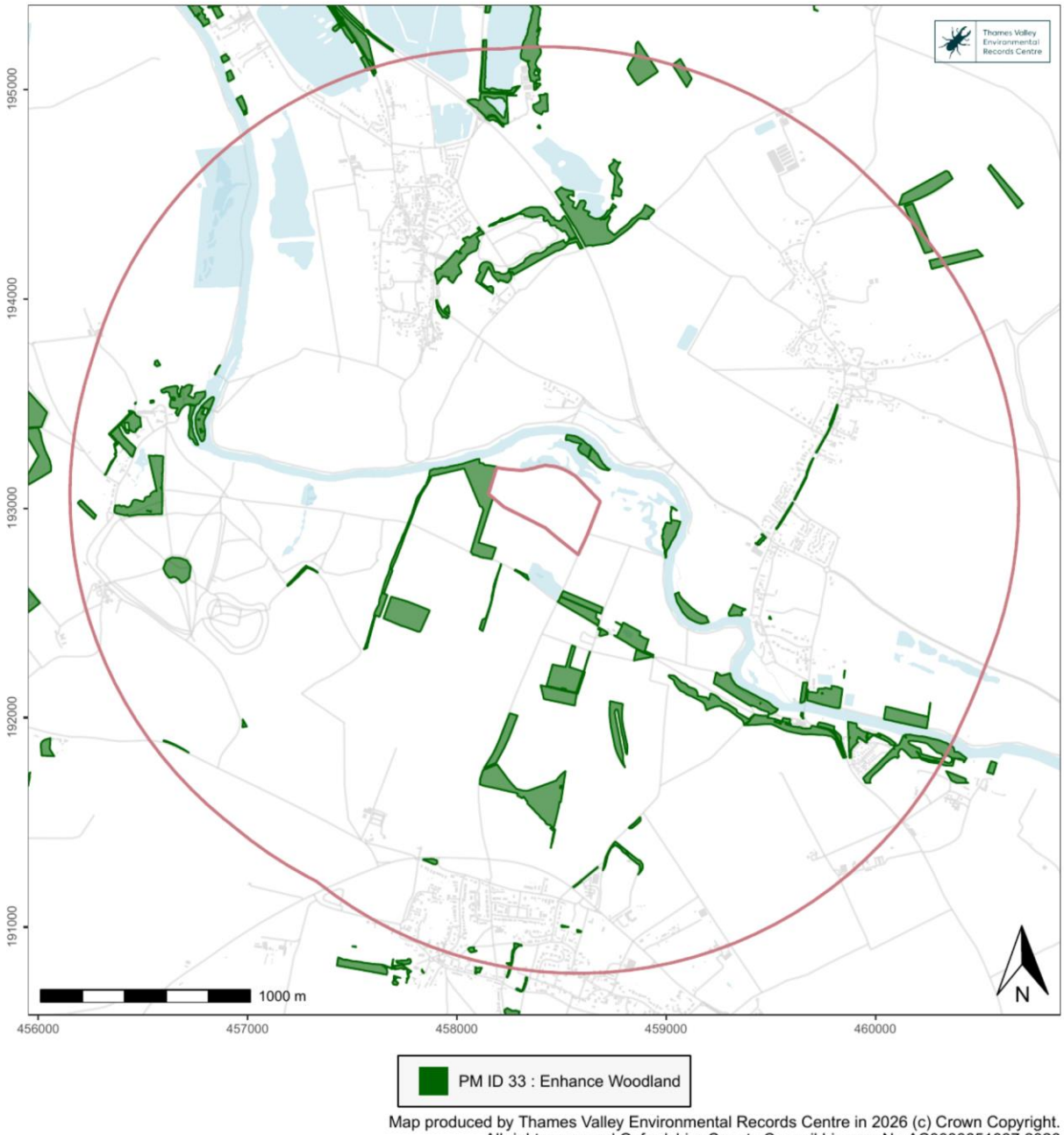
***Wider Benefits***

Undertaking woodland enhancement in suitable locations can be beneficial for a variety of wider environmental benefits including: food production (wild), wood production, recreation and leisure, aesthetic value, interaction with nature, sense of place, flood protection, erosion protection, water quality regulation, carbon storage, air quality regulation, cooling and shading, noise reduction, pest control, and pollination.

## ***Map***

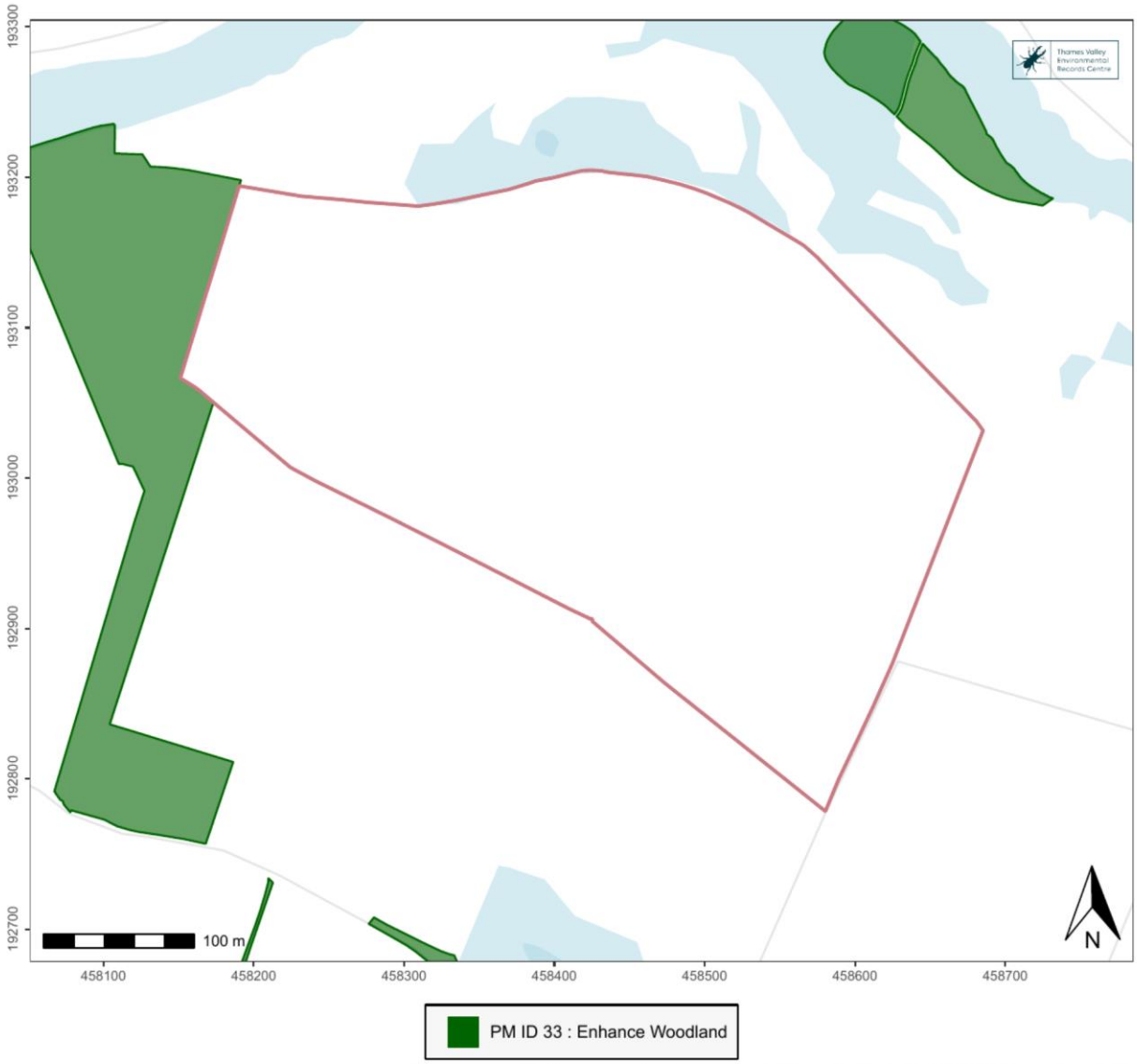
TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 33 : Enhance Woodland
2km search area



## TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 33 : Enhance Woodland
Site boundary



## Oxfordshire Potential Measure 17: Manage Scrub

Part of a series of grassland and scrub habitat measuresThere is **8.88 ha** of Potential Measure ID 17: Manage Scrub within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Areas dominated by shrubbery and grasses, scrubland (or scrub) is often rich in flowering plants and covered with low trees and bushes. Brambles are a common sight; with over 100 species in the UK, these plants provide dense shelter and berries for food. You're also likely to see ivy, which is one of the first sources of pollen and nectar in spring.

Fallen branches caused by storms can sometimes be left in scrubland to encourage wood decay beetles to forage and feed on their decaying mass, which in turn is absorbed and broken down by fungi."

from Canal & River Trust

### *Description*

This mapped measure indicates areas for managing existing areas of scrub to create a varied age and physical structure, including glades and scalloped edges. The aim of this measure is to create and retain more area of scrub and pockets of 'messier, less tidy' habitat for their importance to biodiversity.

### *Action*

Unless the scrub has encroached excessively, avoid damaging or removing existing scrub habitat for fear of untidiness. Scrub habitat is dynamic (changes quickly) and is a complex mix of grassland and woody habitats that offer great value to biodiversity. Manage the area to allow different pockets of scrub to grow up at different points in time to create a variety of ages and encourage and aim to keep any older or old scrub which supports particular invertebrate communities. See this Natural England guide on scrub management. or see here for some examples of managing scrub on chalk grassland.

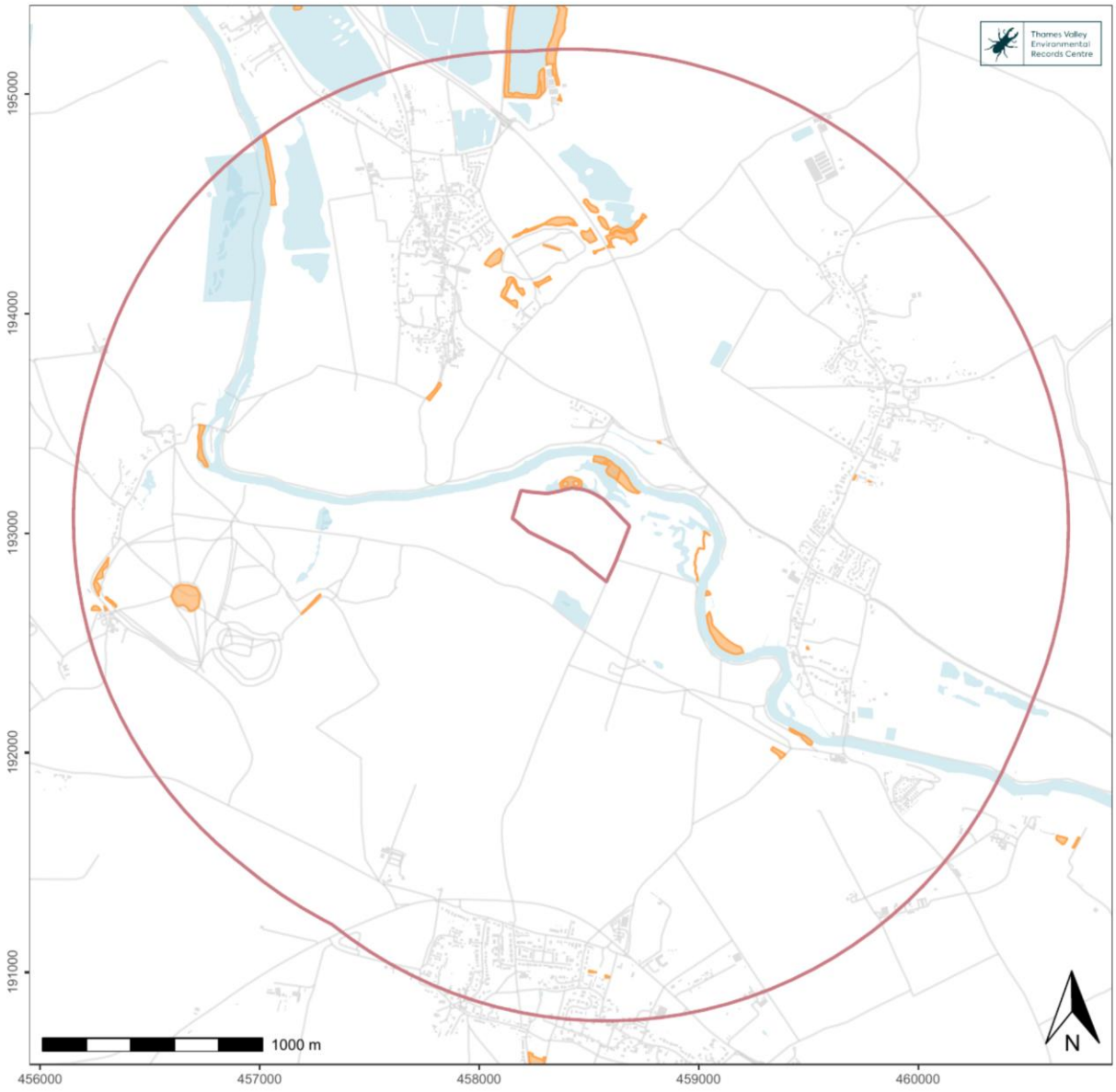
### *Wider Benefits*

Undertaking scrub management in suitable locations can be beneficial for a variety of wider environmental benefits including: interaction with nature, carbon storage, flood protection, erosion protection, air quality regulation, cooling and shading, pest control, and pollination.

## ***Map***

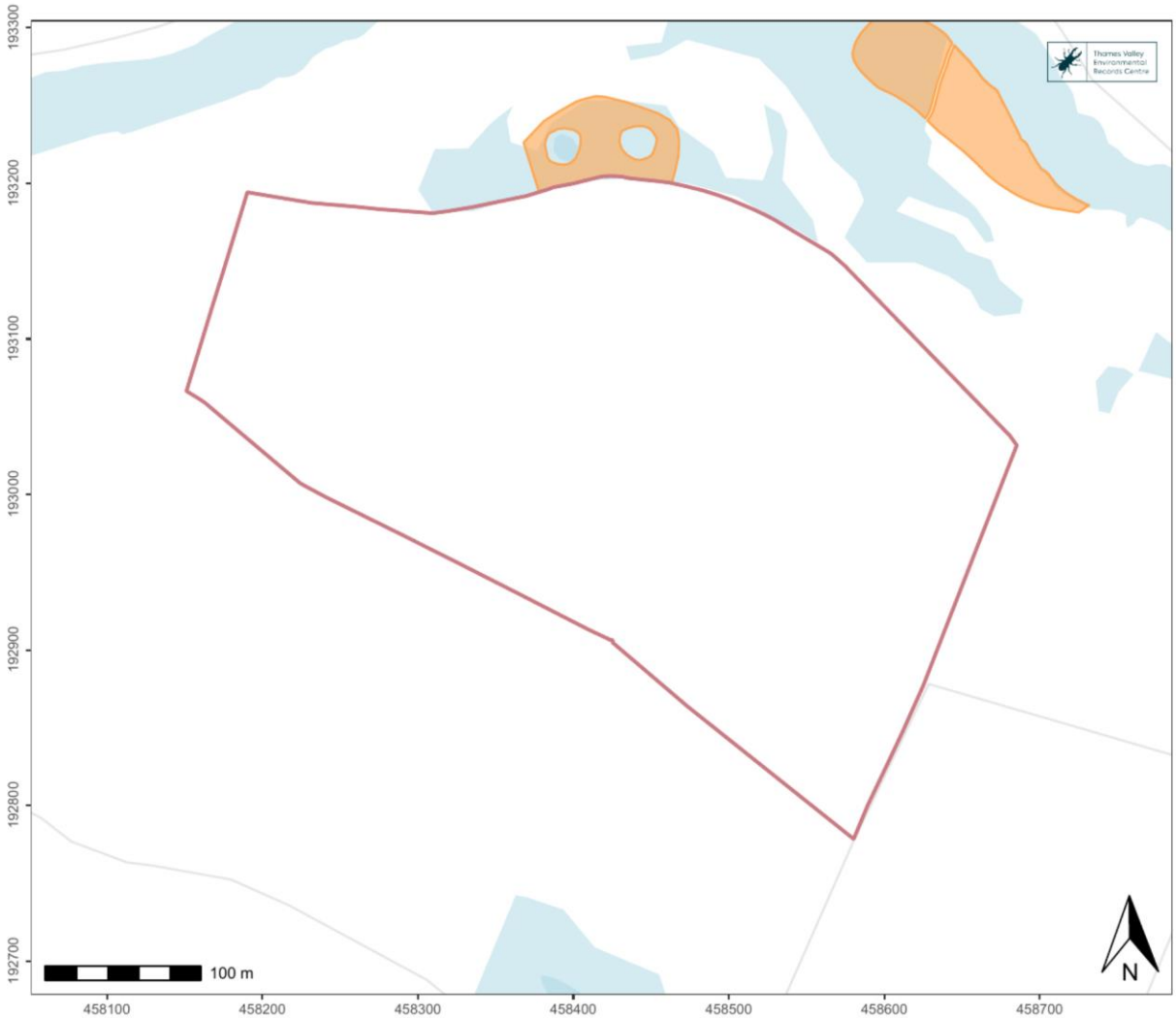
TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 17 : Manage Scrub
2km search area



## TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 17 : Manage Scrub
Site boundary



## Oxfordshire Potential Measure 1: Enhance & Maintain Areas of Particular Importance for Biodiversity (APIB)

There is **128.21 ha** of Potential Measure ID 1: APIB within the 2km buffer.

Back to Overview of Habitat Measures table

### *Description*

This mapped measure indicates areas for enhancing and maintaining existing areas that are particularly important for biodiversity in Oxfordshire. The aim of this measure is to enhance the ecological condition of Oxfordshire's existing designated sites and irreplaceable habitats, whilst aiming to achieve good ecological condition.

### *Action*

Enhance (and maintain in good condition) the sites in Oxfordshire that are designated for biodiversity or considered to be irreplaceable. Also look for ways to enhance/maintain the land that buffers these sites. For Oxfordshire, this includes designated sites such as Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Local Wildlife Sites (LWS), National Nature Reserves (NNR), Local Nature Reserves (LNR), and Oxfordshire's irreplaceable habitats including ancient and veteran trees, ancient woodland, and lowland fens. The 'sites' are mapped for their importance to biodiversity either as designated, locally important, or irreplaceable habitats.

Within the sites themselves, aim to enhance the area to either achieve, or maintain a good ecological condition and benefit local species. It is important for SACs and SSSIs that advice is sought from Natural England regarding appropriate management. For Local Wildlife Sites, advice may be available from the Berks, Bucks and Oxon Wildlife Trust. Contact TVERC for more detail about the importance of a particular site within the APIBs, including citations for designated sites which identify the habitats and species for which the site is important.

On the land around/adjacent to the existing sites, it would be important and beneficial to provide a suitable buffer area of appropriate, complementary habitat to benefit the site and the wildlife around it. Actions in the buffer area could aim to enhance any existing habitats, create new complementary habitat areas, or reduce disturbance or pollution in that area including reduced run off or chemical inputs. Ultimately, these actions should aim to benefit the ecological health of the neighbouring irreplaceable or designated site.

Different sites will need different types/sizes of buffer habitat to offer the greatest benefits to wildlife in the area. Typically, it will be of benefit to create areas of low intervention land use in the land that buffers existing areas of importance for biodiversity, or to create mosaic habitat areas at these buffer edges that complement the adjacent site.

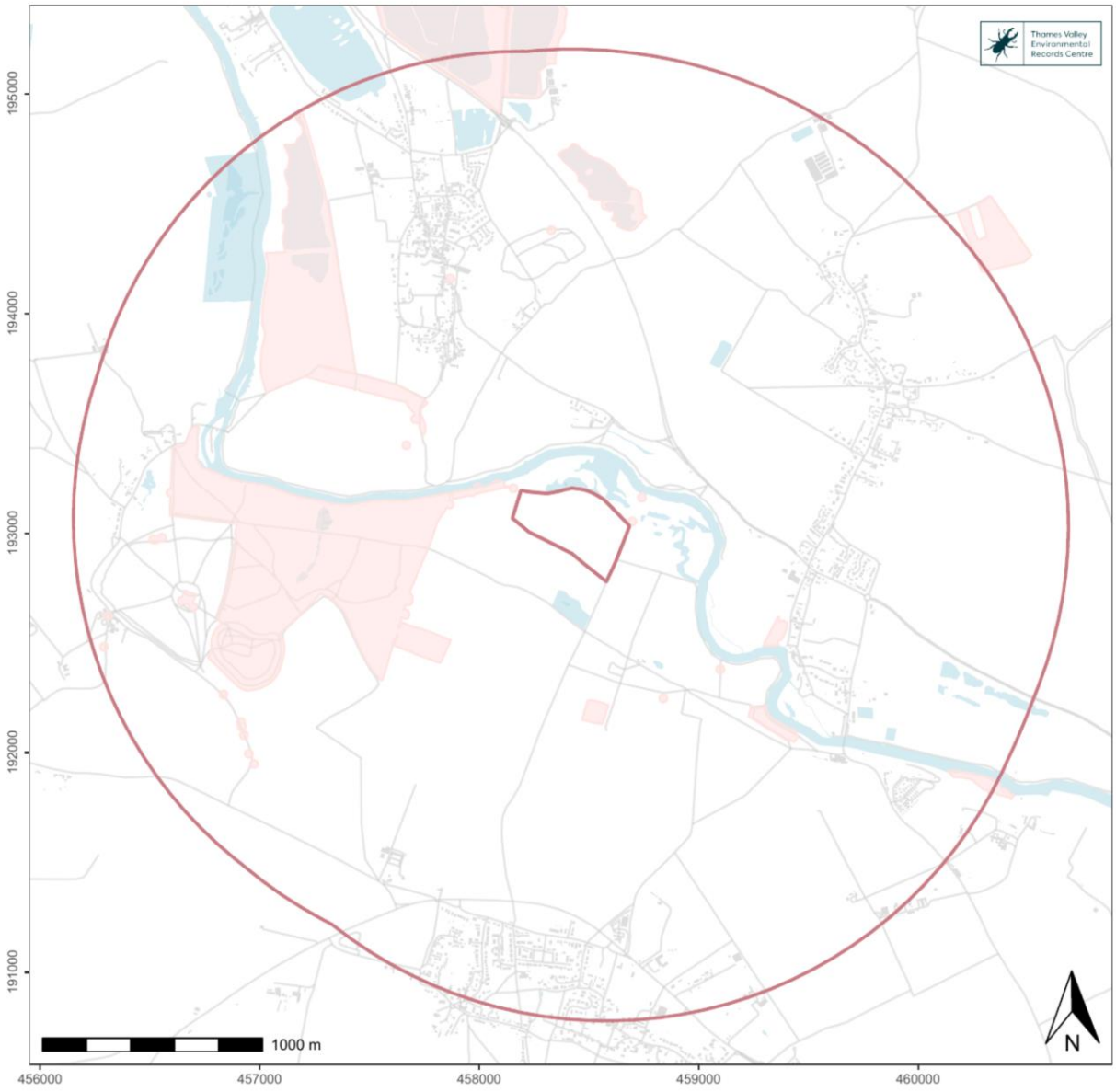
### *Wider benefits*

Undertaking enhancement of designated sites and irreplaceable habitats in suitable locations can be beneficial for a variety of wider environmental benefits including: recreation and leisure, aesthetic value, interaction with nature, sense of place, water supply, flood protection, erosion protection, water quality regulation, carbon storage, air quality regulation, cooling and shading, noise reduction, pest control, and pollination.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 1 : APIB
2km search area



## Oxfordshire Potential Measure 9: Create Lowland Meadow

Part of a series of grassland and scrub habitat measures.There is **73.91 ha** of Potential Measure ID 9: Create Lowland Meadow within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Moist, deep soils that are neither particularly acid nor lime-rich support flower-rich swards with cuckoo flower, meadow buttercup, common sorrel, meadow vetchling and oxeye daisy, followed later in the summer by taller species such as meadowsweet and great burnet. Wetter, less fertile sites support marsh marigold and more sedges.

Drier meadows and pastures are not quite so scarce and can still be found in corners of farms that have escaped 'improvement', and in nature reserves, churchyards and on road and railway embankments. Sweet vernal-grass (which gives hay much of its characteristic scent) and crested dog's-tail are typical grasses, but it is the herbs, including species such as cowslip, red clover, knapweed, oxeye daisy and lady's bedstraw that together make up the bulk of the sward.

Flower-rich meadows and pastures owe their wealth of species to traditional systems of hay-cutting and grazing that have persisted for centuries. Pastures are generally grazed throughout the summer; meadows are shut up in the spring to allow the sward to grow up, so a hay cut can be taken, and then the livestock are brought back to graze the re-growth in late summer. In meadows, the annual removal of vegetation keeps bulky species in check and allows more delicate species to flourish. In pastures, grazing can play a similar role to cutting, but flowering heads are fewer as many are grazed off. Fertile river silt left by floods gently fertilises the sward of floodplain meadows, while on drier sites farmyard manure may be used. Both sources of nutrients help balance the nutrients removed by hay and growing livestock, ensuring the continuity of a diverse sward."

from The Wildlife Trusts

### *Description*

This mapped measure indicates areas for the creation of new areas of lowland meadow through creating and restoring meadows in suitable locations, particularly on floodplains. The aim of this measure is to create new areas of species-rich grassland (including scrub and mosaic habitats) in Oxfordshire that are managed to support biodiversity and to achieve a good ecological condition.

### *Action*

This action is suitable for both floodplain areas and areas of lowland meadow on drier soils. Within floodplains, appropriate actions should be taken to allow water to easily come both onto, and off lowland meadow to help reconnect floodplain meadows with rivers. This can include embanking or deepening of the watercourse to ensure adequate discharge of water after flood events. In suitable locations, meadows could be restored through a range of techniques including by spreading green or dry hay, or brush harvested seed, into the floodplain soils. This can be done by sourcing hay or seed from existing floodplain meadows (as long as this doesn't compromise the condition of those meadows). See the Floodplain Meadows Partnership for advice on meadow creation and funding for farmers. This is a particularly important action for suitable arable fields in other locations where existing hydrological conditions are appropriate.

Floodplain meadows are amongst the UK's rarest and most biodiverse habitats whilst drier meadows are less rare. In the UK, only 1,200 hectares of MG4 floodplain meadow remains. More than 25% of this area is within Oxfordshire meaning that Oxfordshire has a strategically important role in supporting the recovery and expansion of MG4 floodplain lowland hay meadows. In addition, these floodplain habitats have particularly good capacity to store carbon and can improve the soil's ability to hold and capture water to help manage the flow of water and improve water quality.

A technical handbook on floodplain meadows can be found here.

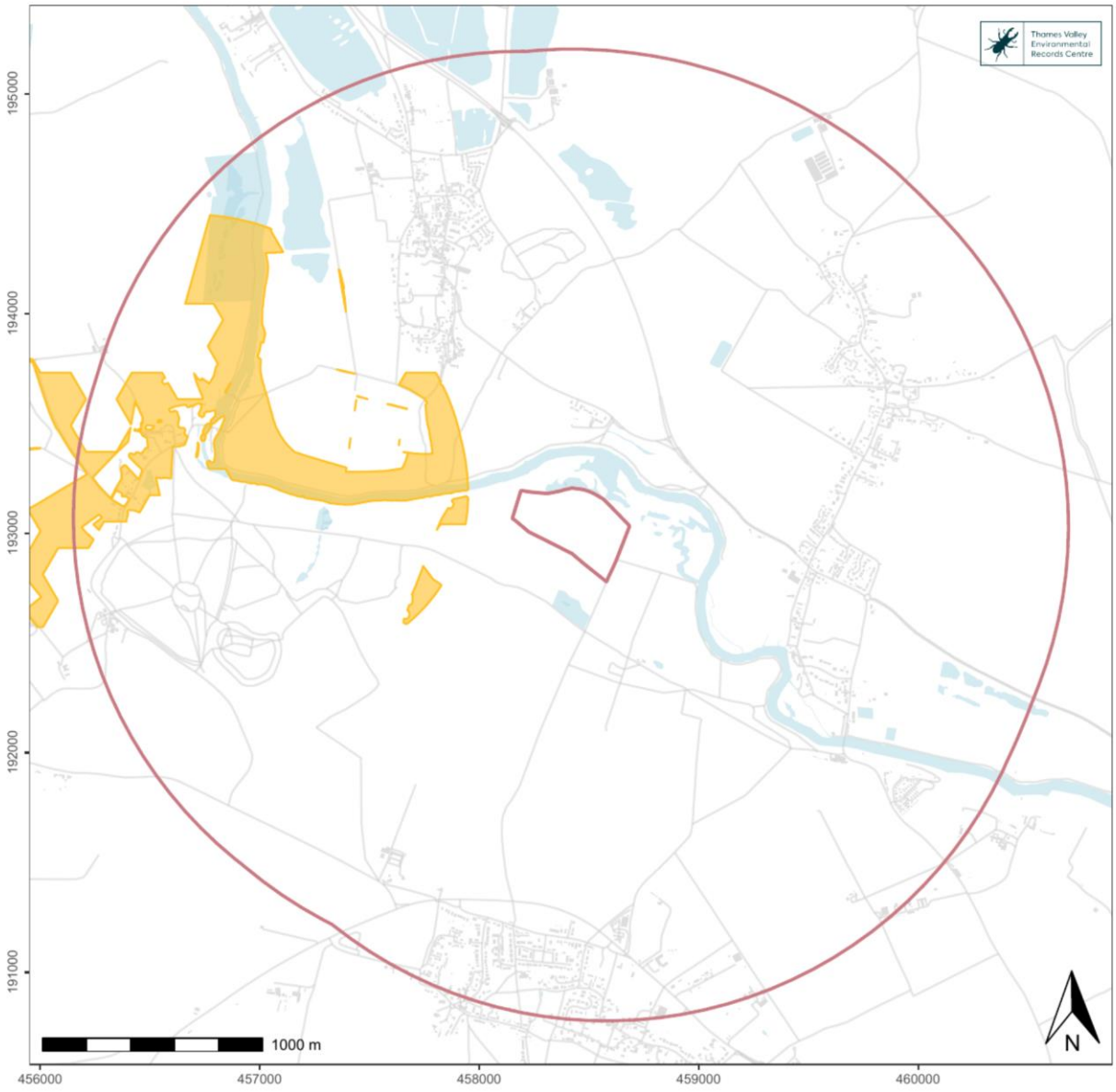
### ***Wider Benefits***

Undertaking lowland meadow creation in suitable locations can be beneficial for a variety of wider environmental benefits including: aesthetic value, erosion protection, water quality regulation, carbon storage, pollination, and pest control.

## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 9 : Create Lowland Meadow
2km search area



## Oxfordshire Potential Measure 11: Enhance Neutral Grassland

Part of a series of grassland and scrub habitat measures.There is **66.86 ha** of Potential Measure ID 11: Enhance Neutral Grassland within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Neutral grassland is a widespread and relatively common grassland type found across much of the UK, particularly in lowland areas. Typical locations include road verges, railway embankments, and unmanaged pastures. It encompasses a range of grassland communities, generally distinguished by their dominant grass species. These habitats are usually found on neutral soils, and are characterised by a moderate plant species diversity, typically ranging from 9 to 15 species per square metre.

In terms of ecological value, neutral grassland sits midway between high-quality habitats - such as species-rich Lowland Meadows (a Priority Habitat) - and more species-poor habitats, like intensively managed amenity grassland or mown lawns. It supports a moderate range of invertebrates, including bees, moths, and butterflies, and provides foraging and nesting opportunities for a variety of birds, as well as habitat for amphibians and small mammals."

from Biodiversity Units

### *Description*

This mapped measure indicates areas to enhance or maintain a good condition of existing neutral species-rich grassland. The aim of this measure is to enhance and manage existing grasslands to achieve and maintain species-rich grasslands that are in long-term good ecological condition.

### *Action*

Use land management techniques to improve or support grassland biodiversity, especially in ancient and unimproved grasslands. Plan to maintain low nutrient levels by undertaking cutting, collecting, and/or grazing of vegetation according to the broad habitat requirements whilst working to meet the specialist needs of species in the area. Ensure that grazing or cutting includes the removal of the cuttings (arisings). Where appropriate, continue hay-making practices and manage the grazing of sites flexibly in response to seasonal variations in vegetation growth. Ensure that a thick thatch of grassy matter doesn't develop to increase nutrients, suppress wildflowers, or create a fire risk. Further information about meadows can be found from Plantlife.

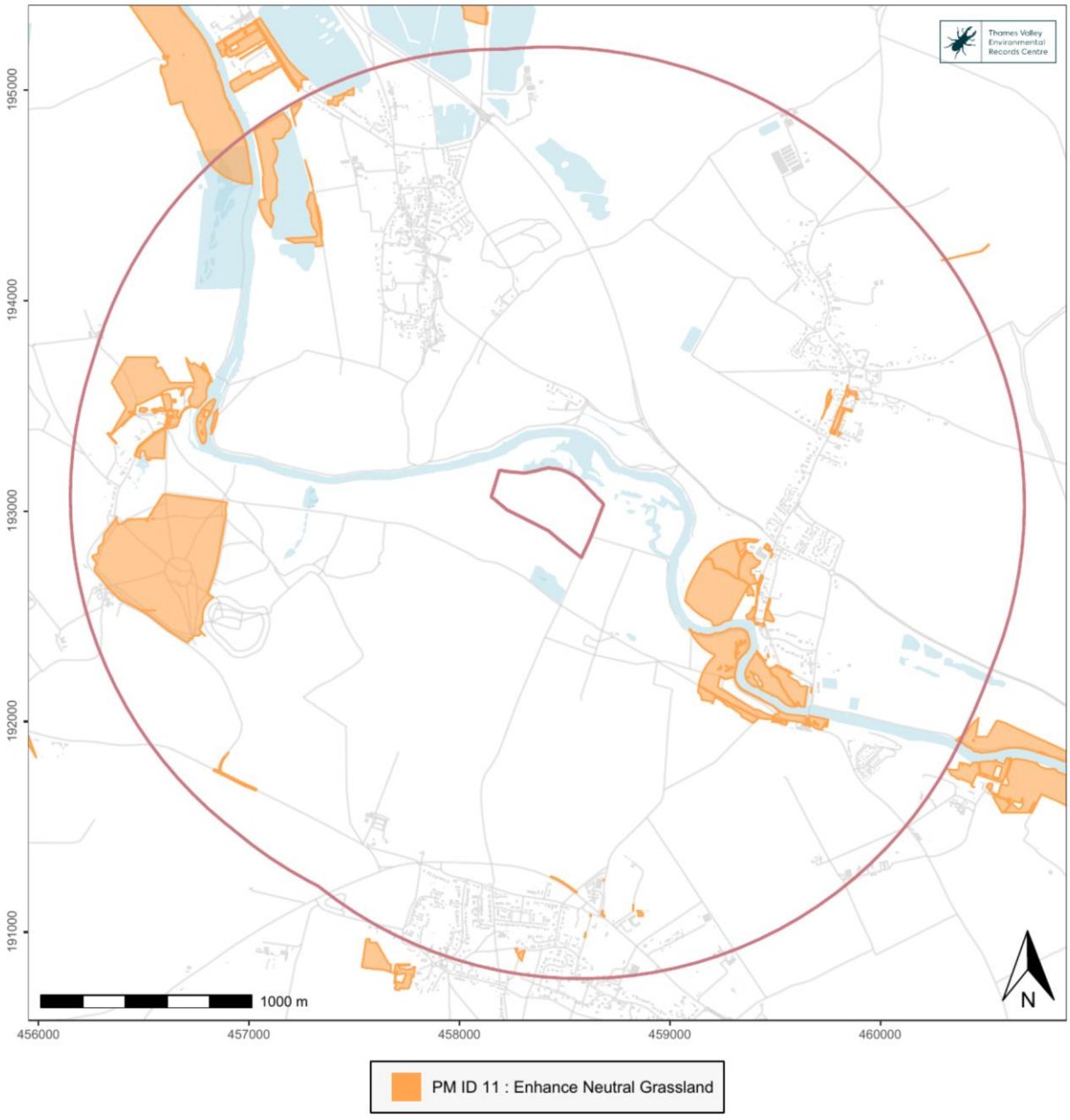
### *Wider Benefits*

Undertaking neutral grassland enhancement in suitable locations can be beneficial for a variety of wider environmental benefits including: food production, recreation and leisure, aesthetic value, interaction with nature, sense of place, erosion protection, water quality regulation, carbon storage, pest control, and pollination.

## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 11 : Enhance Neutral Grassland
2km search area



## Oxfordshire Potential Measure 5: Create Calcareous Grassland

Part of a series of grassland and scrub habitat measures.There is **57.73 ha** of Potential Measure ID 5: Create Calcareous Grassland within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Famous for its floristic richness (there can be over 40 species per square metre of turf) and its rare and beautiful butterflies, this habitat is mostly found on the low chalk or hard limestone hills of southern England and along the wilder coastal cliffs and headlands of limestone country in the west of England and in Wales. Traditionally sheep grazed, the typically short and open turf, well-drained conditions and sunny climate also make it suitable for invertebrates, and there are hundreds of rare species associated with the habitat. Scrub is typically present and includes lime-loving species such as guelder rose, dogwood and burnet rose, in addition to hawthorn and blackthorn, and occasionally juniper. The scrubby grassland margin tends to be less well-grazed, and supports species not found out on the open grassland, such as common calamint and the great green bush-cricket."

from The Wildlife Trusts

### *Description*

This mapped measure indicates areas for the creation of calcareous species rich grasslands in suitable locations, particularly slopes. The aim of this measure is to create new areas of species-rich grassland (including scrub and mosaic habitats) in Oxfordshire that are managed to support biodiversity and to achieve a good ecological condition.

### *Action*

Semi-improved or modified grasslands can be diversified by preparing low nutrient ground and over seeding. Where appropriate, arable areas can be reverted to wildflower grassland through seeding, following site preparation. Plants grown as plugs can be used for species that do not spread well as seed. Use seed or plug sources of local provenance and similar soil conditions as far as possible. Green hay from similar wildflower grasslands can be spread as an alternative to seed. See creation and management guidance to create new areas of calcareous grassland. They include further details about ground preparation and suitable soils.

Some hotspot locations include White Horse Hill, Hackpen Hill, the Berkshire Downs border, and steep calcareous banks and slopes.

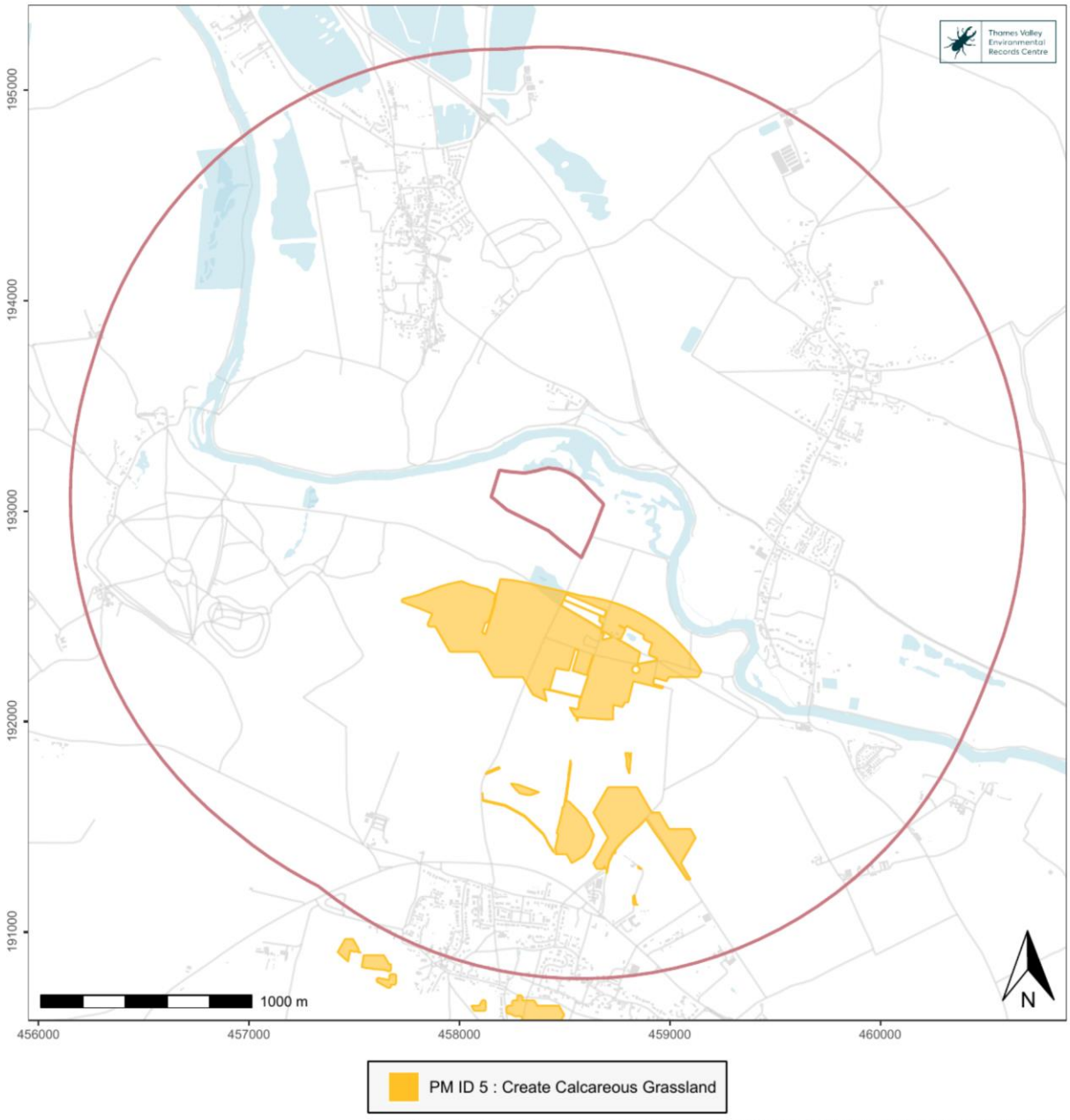
### *Wider Benefits*

Undertaking calcareous grassland creation in suitable locations can be beneficial for a variety of wider ecosystem services including: aesthetic value, erosion protection, water quality regulation, carbon storage, pollination, and pest control.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 5 : Create Calcareous Grassland
2km search area



## Oxfordshire Potential Measure 75: Restore Biodiversity Around Heritage Assets

A wider environment measure concerning archaeological and heritage assets.

There is **39.87 ha** of Potential Measure ID 75: Restore Biodiversity Around Heritage Assets within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Historic England and Local authorities designate different types of heritage assets including buildings, designed landscapes, conservation areas, and archaeological sites.

from SPAB and Historic England

- 'Scheduling' is the selection of nationally important archaeological sites. These sites can include standing stones, burial mounds, the remains of monastic buildings and more. They can be above or below ground and can consist of remains as well as structures that are still in use. The Schedule of Monuments has nearly 20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites.
- A Conservation Area is an area of the urban or rural built landscape set out, defined and designated by the Local Authority as an area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. Conservation Areas have been being designated since 1967 and there are now approximately 7,000 conservation areas in England. Conservation areas vary greatly in their nature and character. They range from the centres of historic towns and cities, fishing and mining villages, historic suburbs, model housing estates, country houses set in historic parks, through to historic transport links and their environs."

### *Description*

This mapped measure indicates areas for the restoration of biodiversity around heritage assets and scheduled monuments in a complementary manner. The aim of this measure is to restore and enhance biodiversity across the landscape in a manner that complements the landscape and historical and cultural features.

### *Action*

If appropriate and suitable, take action to create, enhance, or maintain habitats around heritage assets and scheduled monuments. Actions should aim to achieve a good ecological condition to benefit biodiversity and should be undertaken in a manner that is complementary to the heritage feature(s), and not in a way that would cause them damage.

Often, but not always, grassland actions are likely to be possible, sometimes other actions may be suitable too. However, this must be checked before plans can be agreed or formalised. Before planning habitat actions on sites with heritage assets, consult with the relevant authorities like the County Council Archaeology team (archaeologydc@oxfordshire.gov.uk) and with Historic England.

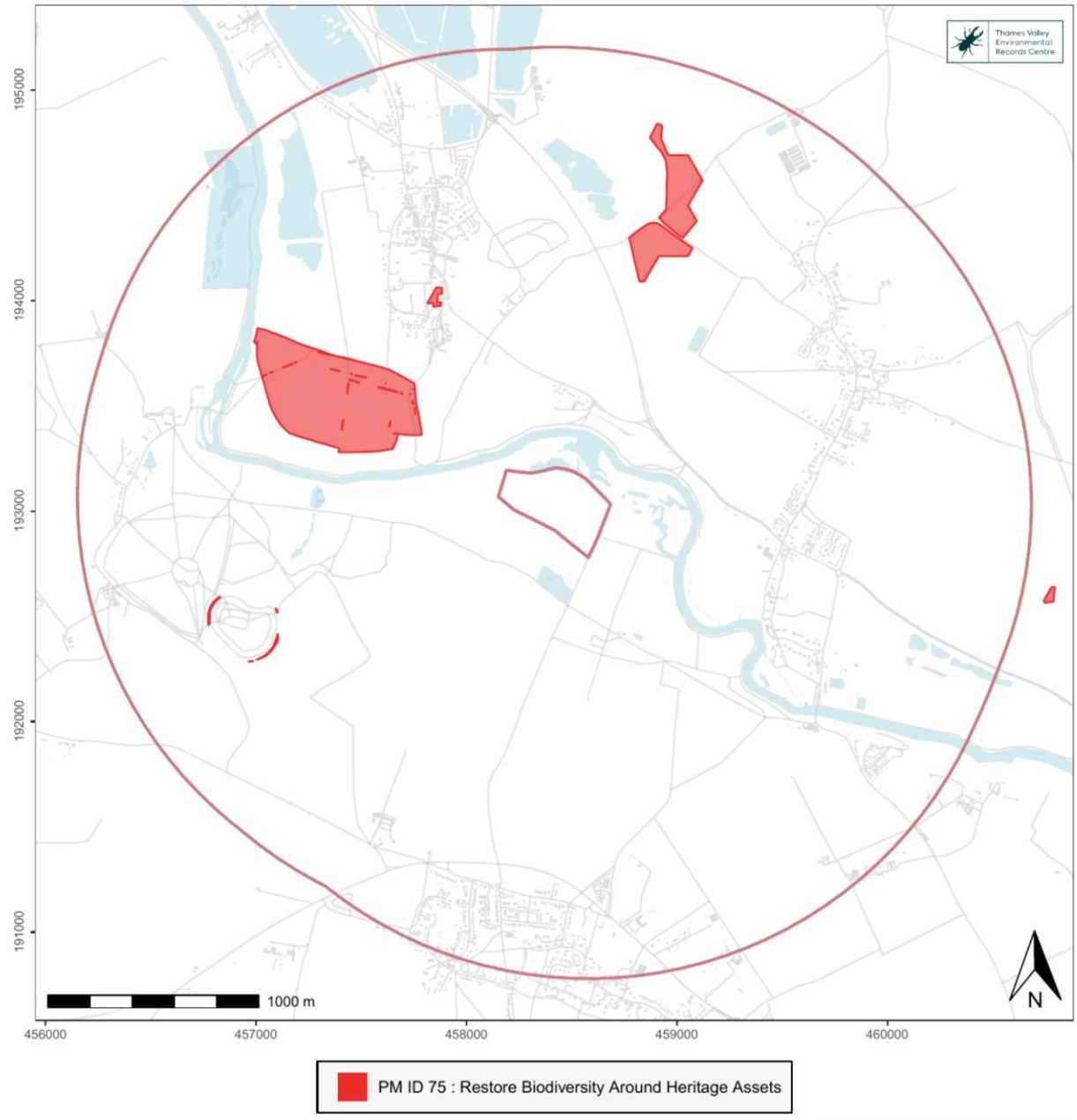
***Wider Benefits***

Undertaking biodiversity restoration in suitable locations around heritage assets can be beneficial for a variety of wider environmental benefits including: flood protection, erosion protection, water quality regulation, carbon storage, pollination, recreation and leisure, aesthetic value, education and knowledge, interaction with nature, and sense of place.

## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 75 : Restore Biodiversity Around Heritage Assets
2km search area



## Oxfordshire Potential Measure 76: Create & Enhance Greenspace in Urban Areas

Part of a series of wider environment measures, especially concerning villages, towns, cities, and green spaces.There is **32.53 ha** of Potential Measure ID 76: Create & Enhance Greenspace in Urban Areas within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Greenspace – also referred to as green infrastructure or green systems – encompasses all types of urban greenspace, ranging from public and private spaces such as domestic gardens, to the open spaces alongside roads and railway lines. The promotion of green infrastructure, or urban greening, has received considerable attention as a means of attracting people into their local natural environment by improving community access, recreation opportunities, and environmental and ecological quality close to and within communities.

Green networks, corridors and linkages are widely seen as a key mechanism for reversing the effects of fragmentation on biodiversity. They also deliver a range of other social and environmental benefits, including enhancement of local landscape character, and greater opportunities for public access and recreational use."

from Forest Research

### *Description*

This mapped measure indicates areas for the creation and/or management of greenspaces and habitats in urban areas to enhance their condition to benefit wildlife, improve connectivity, and provide wider benefits. The aim of this measure is to enhance and create more, connected habitats and spaces for nature in Oxfordshire's villages, towns, and cities to make biodiversity and a connection with nature part of daily life and to realise the wider benefits of nature in urban areas such as urban cooling, reduction of surface water run-off, and cleaner air.

### *Action*

Consider opportunities to create, enhance, or manage habitats and wildlife-friendly features. In and around settlements, various actions can be taken to create and/or enhance greenspaces, and habitats like those listed within this document (above), including but not limited to; grasslands, scrub, road verge nature reserves, orchards, parkland, woodland, mosaic habitats, wetlands, freshwater habitats, and rivers. Many of the sections above have further advice and guidance to help with these actions. Vary the action to be suitable to the scale, size, and type of habitat or greenspace in question as well as any species present or nearby. Any actions taken should also be compatible with the current land-use and should respect community preferences. See Wild Oxfordshire guidance for supporting nature on your local patch.

In urban environments, prioritise connectivity so that wildlife can more easily move between neighbouring land, and aim to establish a robust ecological network that supports wildlife movement through urban areas, making nature a part of daily life.

Actions to benefit biodiversity can also be tailored to deliver important benefits for local communities, including addressing inequitable distribution of environmental determinants of health and wellbeing', and improving climate resilience. Such actions could include innovative solutions like green (or brown) roofs, biodiverse swales, or rainwater gardens to mitigate the impacts of flooding. Other actions could include the use of vegetation cover to provide shade to mitigate excess heat and to filter particulate air pollution.

The advice sheet offers guidance on managing parks and green spaces for pollinators but you can refer up to other sections in this list for guidance about e.g. creating orchards, enhancing woodlands, creating ponds, and more.

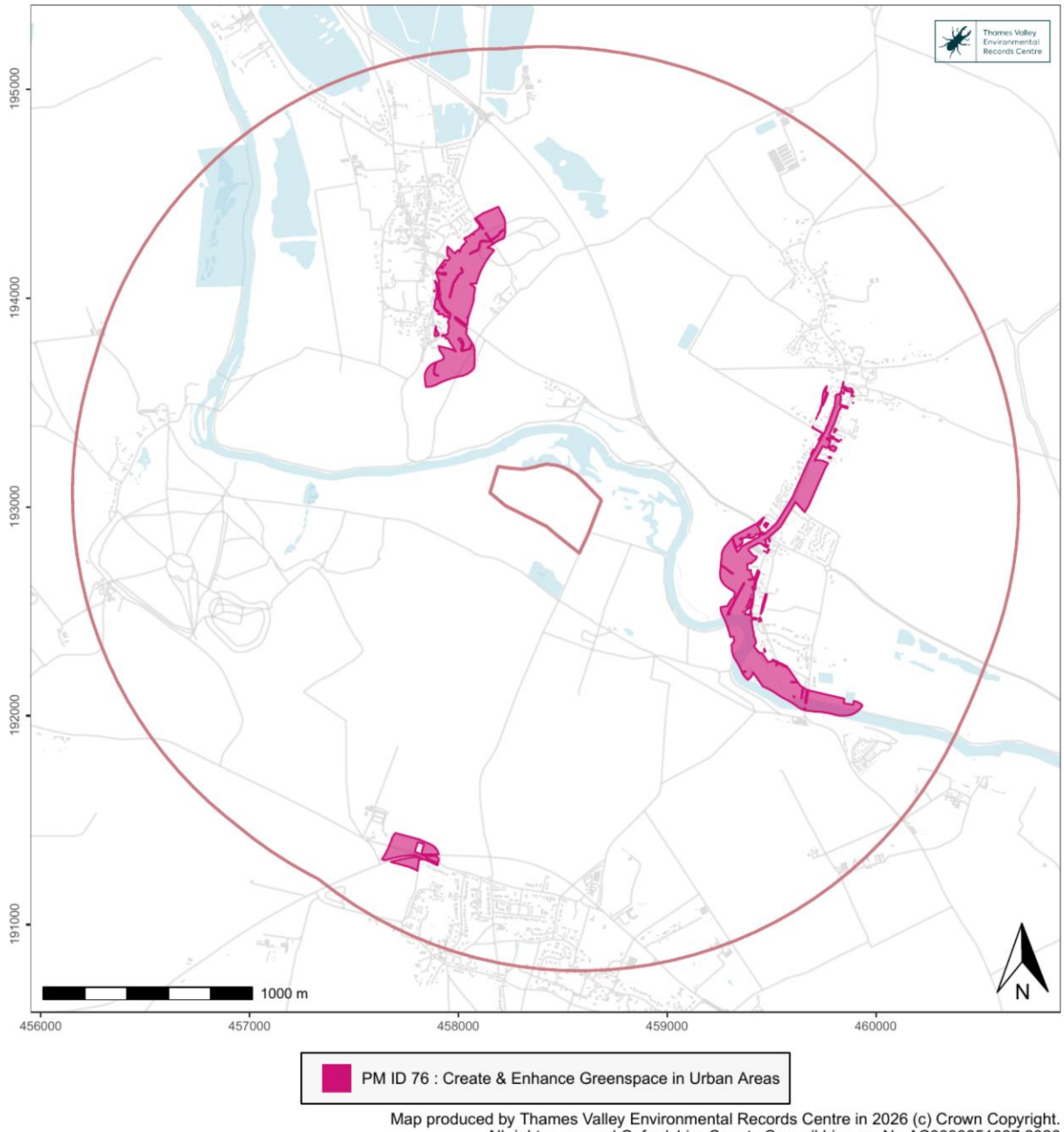
***Wider Benefits***

Undertaking the creation and enhancement of greenspace in urban areas in suitable locations can be beneficial for a variety of wider environmental benefits including: aesthetic value, interaction with nature, sense of place, flood regulation, air quality regulation, carbon storage, cooling and shading, noise reduction, pest control, and pollination.

## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 76 : Create & Enhance Greenspace in Urban Areas
2km search area



## Oxfordshire Potential Measure 26: Enhance Traditional Orchards

Part of a series of mixed habitat measures, including measures for wood pasture, parkland, orchards, and open mosaic habitats.There is **15.87 ha** of Potential Measure ID 26: Enhance Traditional Orchards within the 2km buffer.

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### *About This Habitat*

"Orchards are areas of trees and shrubs planted for food, usually fruit. They are an historic habitat; many species of fruit tree were brought over by the Romans and cultivating fruit trees might date back to the Neolithic period. Not only are orchards useful and beautiful, they can also be important for wildlife. They are perfect for pollinators, and fruit trees age quickly which creates essential deadwood habitats.

Because orchards are mosaics of trees, grasses, shrubs and wild flowers, they support a wide range of wildlife. As fruit trees age quickly, they create the perfect habitats for invertebrates and birds, such as the lesser spotted woodpecker and the rare noble chafer beetle. Orchards also lend themselves to certain mosses, as well as plants like mistletoe."

from Woodland Trust

### *Description*

This mapped measure indicates areas to improve or maintain a good condition of existing orchards for biodiversity. The aim of this measure is to enhance and manage existing habitats to support biodiversity and to enhance their ecological condition.

### *Action*

Manage orchard trees to maintain health and longevity of the trees. Allow dead, decaying, dying wood, and fungi to be present in the orchard in a manner that doesn't significantly compromise the health of the trees. For example, retain cushion bracket fungus on Prunus fruit trees and try to avoid removing or burning deadwood unless necessary (e.g. taking into account public safety if the site is open access). Retain and encourage mature and over-mature standing trees, and keep some standing deadwood and deadwood on living orchard trees. Plant successionally to maintain a strong overlap of younger, mature, and veteran fruit trees, and gap up where trees have died. Ideally, the age structure should allow for an overlap of 50 years which is how long it takes for a fruit tree to develop veteran features. When restocking existing orchards, consider including rootstocks, varieties, or species of tree with a view to future-proofing the orchards from changing weather patterns. Control scrub within orchards (allowing for small pockets to develop or remain where possible) and manage invasive species which cause significant damage to orchards.

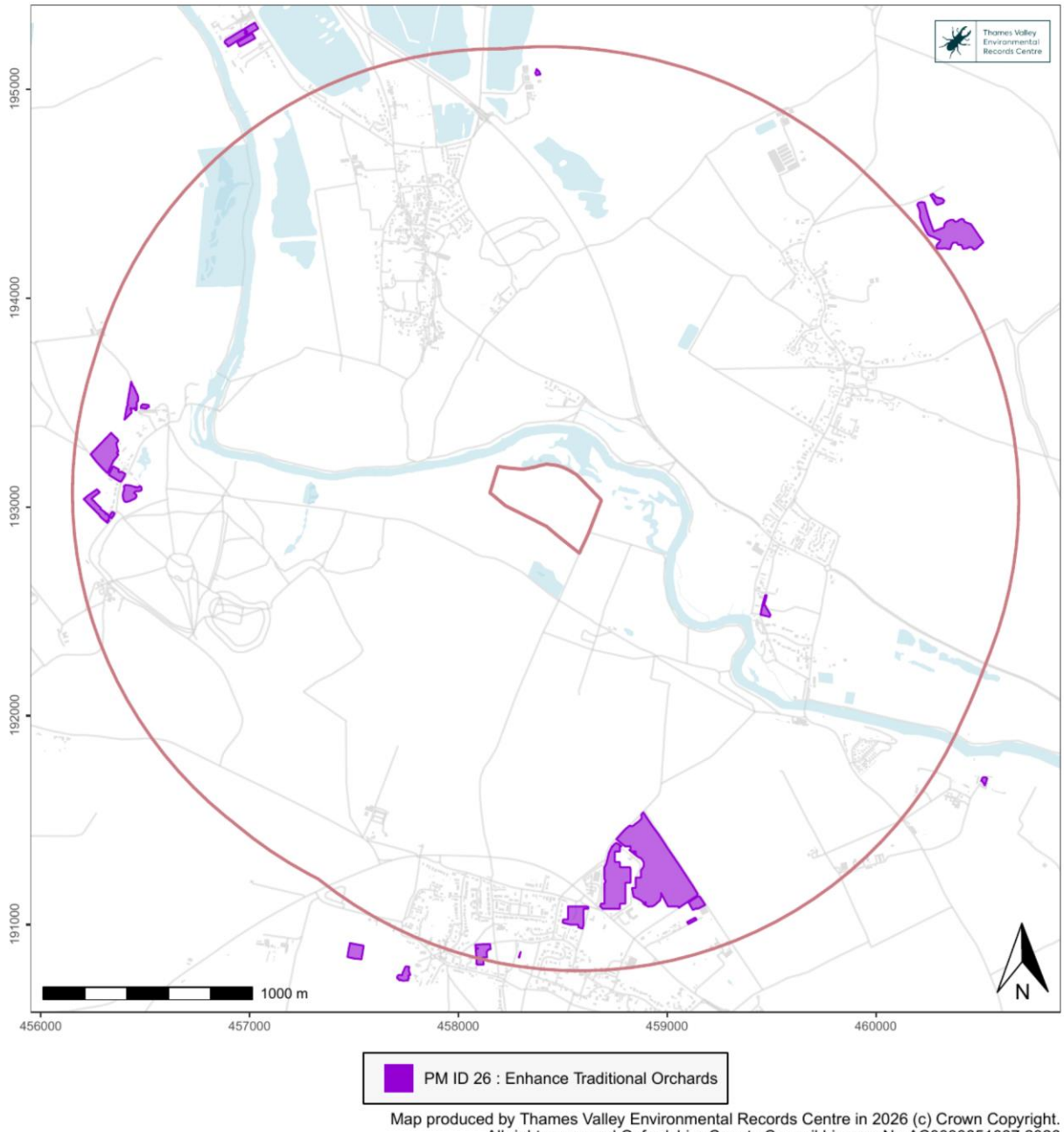
### *Wider Benefits*

Undertaking traditional orchard enhancement in suitable locations can be beneficial for a variety of wider environmental benefits including: food production, wood production, recreation and leisure, aesthetic value, interaction with nature, sense of place, carbon storage, air quality regulation, cooling and shading, pest control, and pollination.

## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 26 : Enhance Traditional Orchards
2km search area



## Oxfordshire Potential Measure 29: Create Wood Pasture & Parkland

Part of a series of mixed habitat measures, including measures for wood pasture, parkland, orchards, and open mosaic habitats.There is **13.3 ha** of Potential Measure ID 29: Create Wood Pasture & Parkland within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Wood pasture and parkland is land that has been managed through grazing. They can be ancient, or of more recent origin, and occur in regions with distinct woodland types, such as Caledonian forest. Some started as medieval hunting forests or wooded commons, and others are the designed landscapes from large estates. They are often perfect for spotting ancient and veteran trees.

Trees in wood pasture and parkland are often pollarded. This is an ancient form of management where trees are grown within grazed pastures. The crown was regularly cut at around eight feet high, above the browsing height of the stock below. This allowed the land to be used for both grazing and to provide useful material from the trees.

Wood pasture and parkland sites are often made up of a mixture of habitats, from denser wooded groves to more open areas. Ancient wood pasture and parklands have accumulated the 'old-growth' characteristics that are missing from many enclosed woodlands. These include old trees and large pieces of decaying wood. Ancient and veteran trees are full of nooks and crannies, holes and dead and rotting wood. They offer a range of homes for both widespread and very rare species."

from Woodland Trust

### *Description*

This mapped measure indicates areas for the creation and management of new areas of parkland and wood pasture whilst planning to produce future ancient and veteran trees. The aim of this measure is to create more areas of mixed habitat in Oxfordshire to support biodiversity.

### *Action*

Plant (or facilitate the growth of) new trees to create new wood pasture and parkland, using appropriate tree species that are adapted for the location and future climates and/or could support local wildlife. It should be noted that oaks are particularly important within such habitat settings. New trees could be established by fencing off suitable areas and allowing trees to grow up naturally, by planting seeds, or by planting and managing suitable young trees.

Expanding existing areas of mature parkland and wood pasture can be particularly beneficial. Local seed sourcing should be supported as one option for expanding parkland and wood pasture. If planting trees or seeds, consider using local species where possible and consider sourcing some trees or seed from a provenance that can tolerate various climate conditions where necessary. Diverse tree selection may better enable newly planted trees to be able to survive and become ancient and veterans in a warmer future climate although these decisions should be based on the latest climate prediction and the specific planting site. The Forestry Commission has an Ecological Site Classification tool that can help determine which species could be suitable.

Where appropriate, the species richness of the grassland components within wood pasture/parkland can be created or enhanced using species-rich grassland creation techniques such as overseeding, spreading green hay, and/or planting plug plants. Plan for suitable, future grazing or cutting regimes and where appropriate. In appropriate locations, consider the creation of scrub cover to encourage habitat variety through opportunities for e.g. rabbit grazing and disturbance.

Within these habitats, scrub can also play an important role as part of an overall mosaic and supports certain stages of lifecycles for different species. Look for opportunities to create and manage scrub if appropriate to the site conditions and local species.

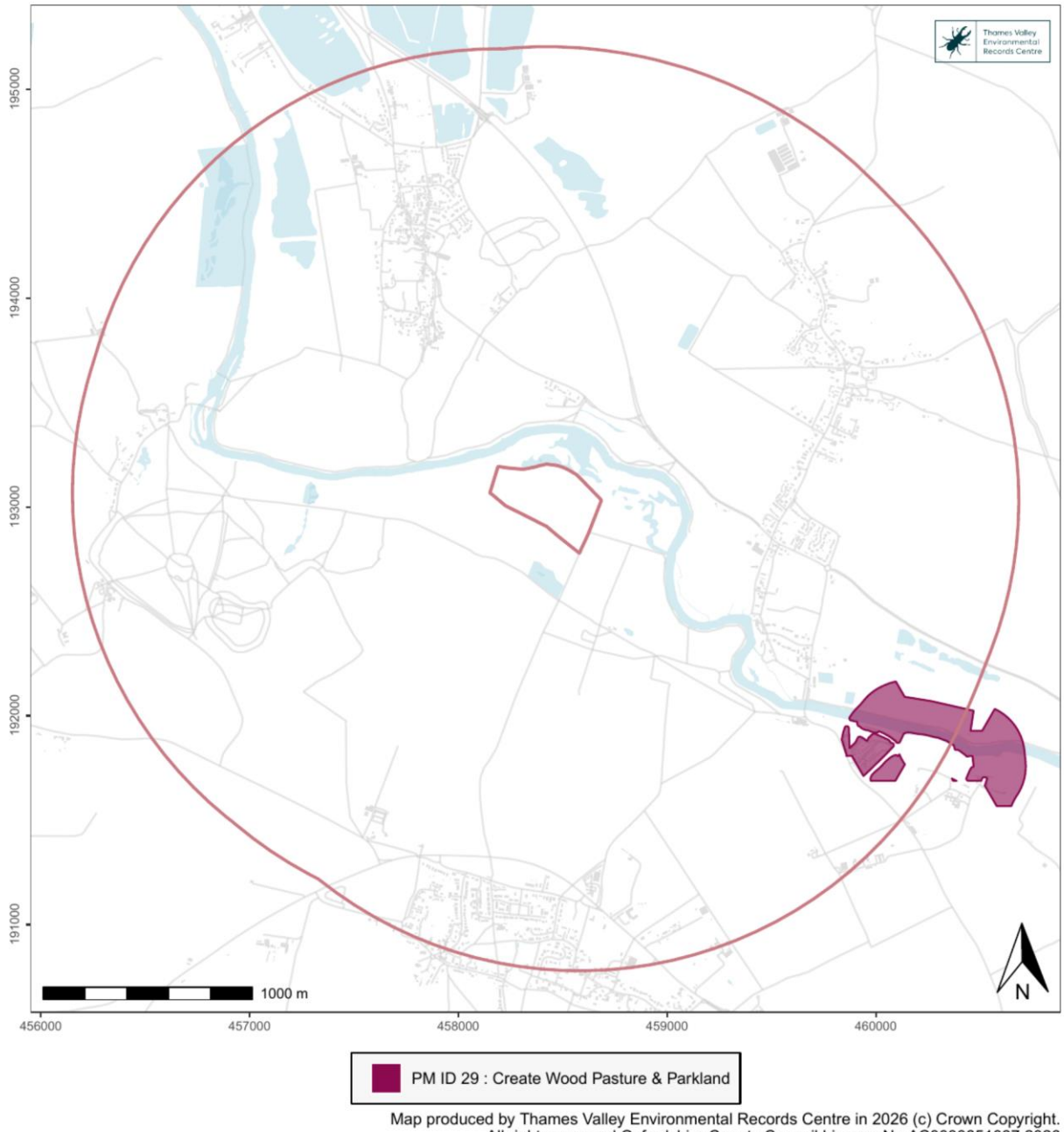
***Wider Benefits***

Undertaking wood pasture and parkland creation in suitable locations can be beneficial for a variety of wider environmental benefits including: food production, wood production, recreation and leisure, aesthetic value, sense of place, carbon storage, air quality regulation, flood regulation, erosion regulation, water quality regulation, cooling and shading, pest control, and pollination.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 29 : Create Wood Pasture & Parkland
2km search area



## Oxfordshire Potential Measure 38: Create Woodland

Part of a series of woodland measures.There is **11.37 ha** of Potential Measure ID 38: Create Woodland within the 2km buffer.

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### *About This Habitat*

"The term woodland encompasses a diverse group of habitats that can be rich in wildlife. They are a key habitat for many invertebrates, plants, birds, mammals and other species groups. Woodlands are also incredibly useful habitats, for instance by providing flood protection by holding back water in the soil, sequestering carbon dioxide and reducing local temperatures. They also help reduce soil erosion and regulate weather patterns, such as local rainfall and temperature. Woodland may also be beneficial to our health, as it's thought that spending time in forests decreases blood pressure, reduces stress levels and boosts your immune system. However, studies are still ongoing into the validity of these effects.

The types of woodland habitat include, but are not limited to, ancient, broadleaved, coniferous, mixed and wet woodland, as well as temperate rainforest, Caledonian forest, wood pastures and urban woodland. Each can have defining criteria such as plant types, soil moisture levels, humidity levels and age. There are also semi-natural and plantation woodlands, which are classified based on the percentage of planted trees. There are several indicator species used to determine the type of woodland habitats, such as the violet click beetle (Limoniscus violaceus), which rely exclusively on ancient decaying beech and ash trees."

from NHBS

### *Description*

This mapped measure indicates areas for the creation of new woodland by planting trees (or enabling their natural regeneration) using species that are suited to the soil type and site condition. The aim of this measure is to create new, diverse woodlands in Oxfordshire that mature into good ecological condition and are managed to support biodiversity.

### *Action*

Create and manage new woodland that complements the landscape across a range of habitats and contains a variety of tree species. Produce a long-term plan to manage the habitat with the aim to achieve a good ecological condition, this should include any relevant management in the early years as the woodland establishes. To establish new woodland, trees may be planted but particularly near existing and ancient woodlands, consider using natural regeneration/colonisation or directly drilling locally sourced seeds to establish young trees. All techniques will still require suitable forms of protection (guards or fencing) as appropriate to the site. Protection should aim to allow the new woodland to successfully establish whilst minimising damage from grazing and disturbance. If the new woodland is isolated from other woodlands, consider introducing locally sourced field-layer flora appropriate to the site conditions (this must be legally obtained and appropriate to the woodland).

Prior to creation, design new woodland planting plans to achieve structural diversity in the future woodland. Plan to create a variety of possible components including rides, glades, open areas,

dense shrubs, scrub components, and irregular edges. Aim for shrubs and scrub to grow within, and at the edges of woodland. Create a management plan to maintain a variety of these components as habitat niches within the woodland, including a plan for succession by younger trees over time to create a variety of tree ages within the woodland. Trees could be planted or allowed to grow naturally using protection from browsing animals over a number of years. If planting trees, consider tree species that suit the soil type for that area and which are likely to survive in a changing climate, with decision being made using the latest climatic predictions.

The creation of new woodland is particularly beneficial in areas that adjoin existing woodland and especially adjoining ancient woodland to make existing woodlands larger, or to join up existing areas of woodland. See this woodland creation guide from the Woodland Trust.

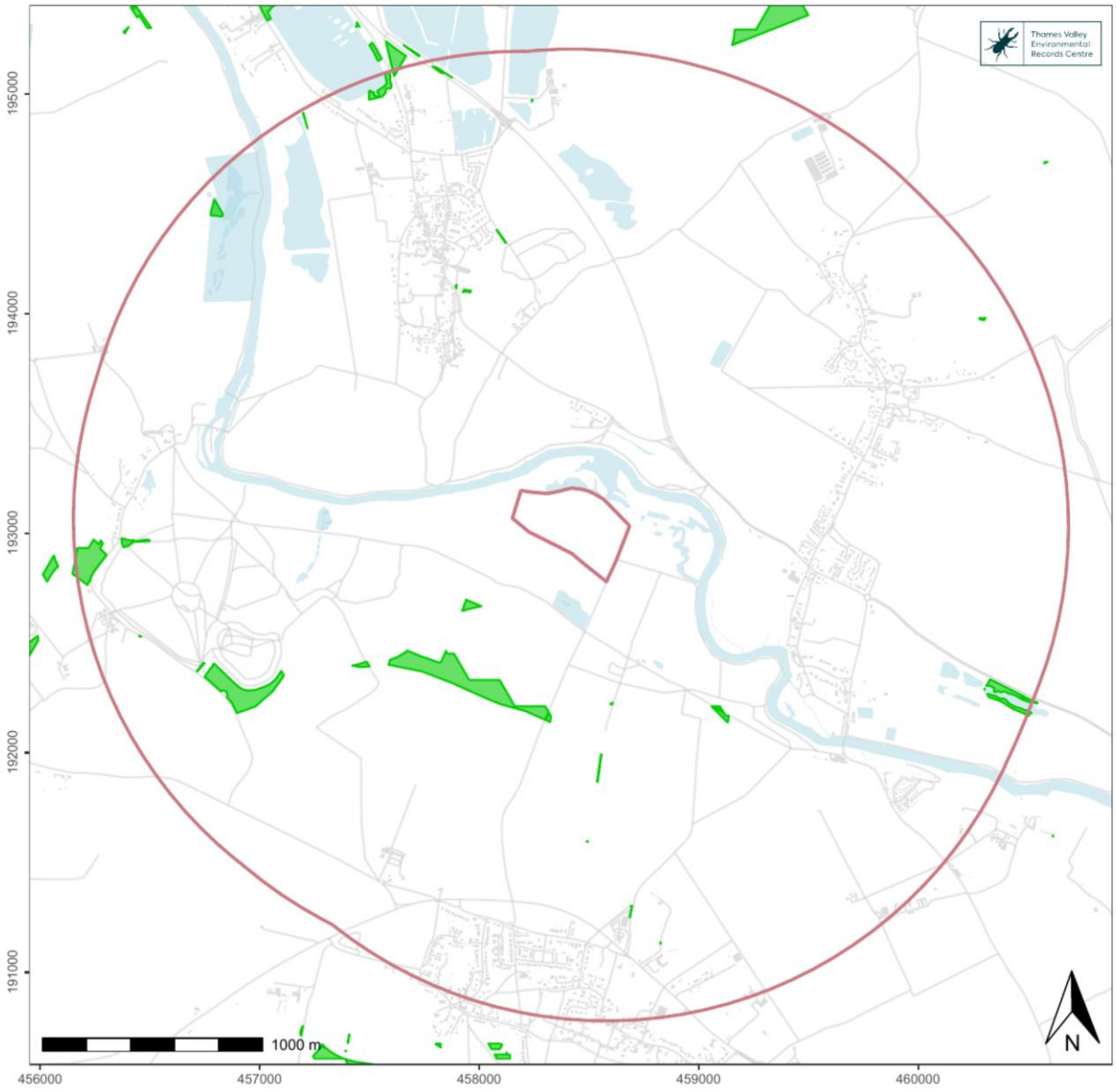
***Wider Benefits***

Undertaking woodland creation in suitable locations can be beneficial for a variety of wider environmental benefits including: food production (wild), wood production, recreation and leisure, aesthetic value, interaction with nature, sense of place, flood protection, erosion protection, water quality regulation, carbon storage, air quality regulation, cooling and shading, noise reduction, pest control, and pollination.

## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 38 : Create Woodland
2km search area



## Oxfordshire Potential Measure 14: Enhance Lowland Meadow

Part of a series of grassland and scrub habitat measures.There is **6.46 ha** of Potential Measure ID 14: Enhance Lowland Meadow within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Moist, deep soils that are neither particularly acid nor lime-rich support flower-rich swards with cuckoo flower, meadow buttercup, common sorrel, meadow vetchling and oxeye daisy, followed later in the summer by taller species such as meadowsweet and great burnet. Wetter, less fertile sites support marsh marigold and more sedges.

Drier meadows and pastures are not quite so scarce and can still be found in corners of farms that have escaped 'improvement', and in nature reserves, churchyards and on road and railway embankments. Sweet vernal-grass (which gives hay much of its characteristic scent) and crested dog's-tail are typical grasses, but it is the herbs, including species such as cowslip, red clover, knapweed, oxeye daisy and lady's bedstraw that together make up the bulk of the sward.

Flower-rich meadows and pastures owe their wealth of species to traditional systems of hay-cutting and grazing that have persisted for centuries. Pastures are generally grazed throughout the summer; meadows are shut up in the spring to allow the sward to grow up, so a hay cut can be taken, and then the livestock are brought back to graze the re-growth in late summer. In meadows, the annual removal of vegetation keeps bulky species in check and allows more delicate species to flourish. In pastures, grazing can play a similar role to cutting, but flowering heads are fewer as many are grazed off. Fertile river silt left by floods gently fertilises the sward of floodplain meadows, while on drier sites farmyard manure may be used. Both sources of nutrients help balance the nutrients removed by hay and growing livestock, ensuring the continuity of a diverse sward."

from The Wildlife Trusts

### *Description*

This mapped measure indicates areas for the enhancement of existing lowland meadows through grazing, cutting, or a combination of both, to increase and support species diversity. The aim of this measure is to enhance and manage existing grasslands to achieve and maintain species-rich grasslands that are in long-term good ecological condition.

### *Action*

This action is suitable for both floodplain lowland meadow, and for lowland meadow on drier soils. Manage these lowland meadows by introducing or maintaining appropriate management techniques like hay-cutting, grazing, and/or mowing regimes which are most appropriate to the site conditions, grassland type, species present, and any hay-making activities. Ensure that arisings are removed.

For grazing regimes, manage stocking densities and the timing of any grazing flexibly, aiming to respond to seasonal conditions and variation as well as preventing either under-grazing or over-grazing. Consider using traditional and/or rare breeds that are hardy and well suited to conservation

grazing. See further advice and guidance on managing floodplain meadows from the Floodplain Meadows Partnership.

For hay cuts, the timing of the hay-cut is critical to the long-term sustainability of species-rich meadows. There will be a need for increased flexibility in both the date and extent of management options in response to long-term seasonal variability in growing conditions and climates. Lowland meadow will need an adequate supply, temporal variation, and quality of water to adapt to changes in climate.

Floodplain meadows are amongst the UK's rarest and most species-rich (biodiverse) habitats whilst drier meadows are less rare. In the UK, only 1,200 hectares of MG4 floodplain meadow remains. More than 25% of this area is within Oxfordshire meaning that Oxfordshire has a strategically important role in supporting the recovery and expansion of MG4 floodplain lowland meadows. This is particularly true around Pixey, Yarton, and Osney Meads where work has been underway to connect 210 hectares of rare floodplain in a connected network with opportunity to expand this further in future. It should be noted that these floodplain habitats have particularly good capacity to store carbon, hold and capture water, manage the flow of water, and improve water quality.

See the technical handbook for floodplain meadows here. See further Natural England handbooks, guidance, and advice for detailed management. Additionally, organisations like Plantlife, and Buglife have resources and information that may be of interest.

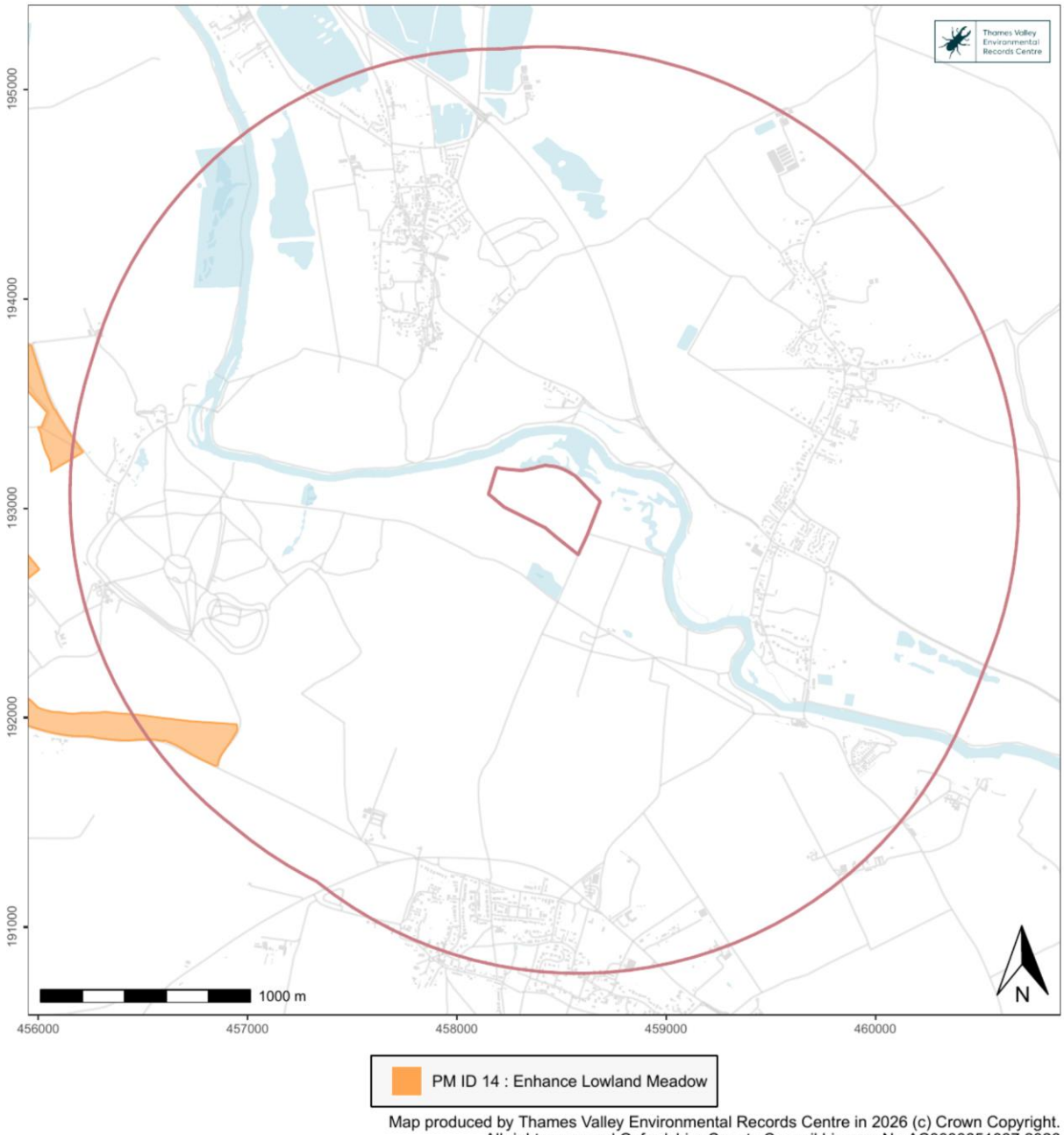
***Wider Benefits***

Undertaking lowland meadow enhancement in suitable locations can be beneficial for a variety of wider environmental benefits including: food production, recreation and leisure, aesthetic value, interaction with nature, sense of place, erosion protection, water quality regulation, carbon storage, pest control, and pollination.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 14 : Enhance Lowland Meadow
2km search area



## Oxfordshire Potential Measure 35: Enhance Ancient Woodland

Part of a series of woodland measures.There is **3.87 ha** of Potential Measure ID 35: Enhance Ancient Woodland within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Ancient woods are areas of woodland that have persisted since 1600 in England, Wales and Northern Ireland, and 1750 in Scotland. This is when maps started to be reasonably accurate so we can tell that these areas have had tree cover for hundreds of years. They are relatively undisturbed by human development. As a result, they are unique and complex communities of plants, fungi, insects and other microorganisms.

Ancient woodlands can be classified into different categories. These include:

from Woodland Trust

- Ancient semi-natural woods which are woods that have developed naturally. Most have been used by humans – often managed for timber and other industries over the centuries – but they have had woodland cover for over 400 years.
- Plantations on ancient woodland sites which are ancient woods that have been felled and replanted with non-native species. Typically, these are conifers, but it can also include broadleaved planting such as non-native beech, red oak, and sweet chestnut. Although damaged, they all still have the complex soil of ancient woodland, and all are considered to contain remnants of the woodland specialist species which occurred before."

### *Description*

This mapped measure indicates areas for enhancing existing ancient woodland to improve structural diversity, woodland, condition, and to benefit local species. The aim of this measure is to enhance and manage existing woodlands to achieve structural diversity and good ecological condition, enabling woodlands to act as a rich source of biodiversity for wildlife to disperse across the landscape.

### *Action*

Create management plans specific to the particular ancient woodland. Aim to enhance structural diversity where appropriate by creating or maintaining rides, glades, and edges in suitable locations (use the UK Forestry Standard to best understand what's appropriate for your site). Periodically thin 'high forest' type woodlands where/when necessary. These are woodlands with mostly tall trees and little to no understory (a lower growing set of trees, shrubs and plants). Prioritise techniques that minimise soil compaction to help safeguard the ancient soil communities, structures, and floristic diversity that are unique to ancient woodlands. In addition, undertake best practice woodland management techniques that support local species.

Apply this measure sensitively, aiming for an outcome that reflects the local context and which complements the history and character of the particular woodland (as well as historical features or

structures). Whilst some are mapped for particular focus, this was also felt to be an important, beneficial action for all existing ancient woodlands which currently cover 3.4% of Oxfordshire.

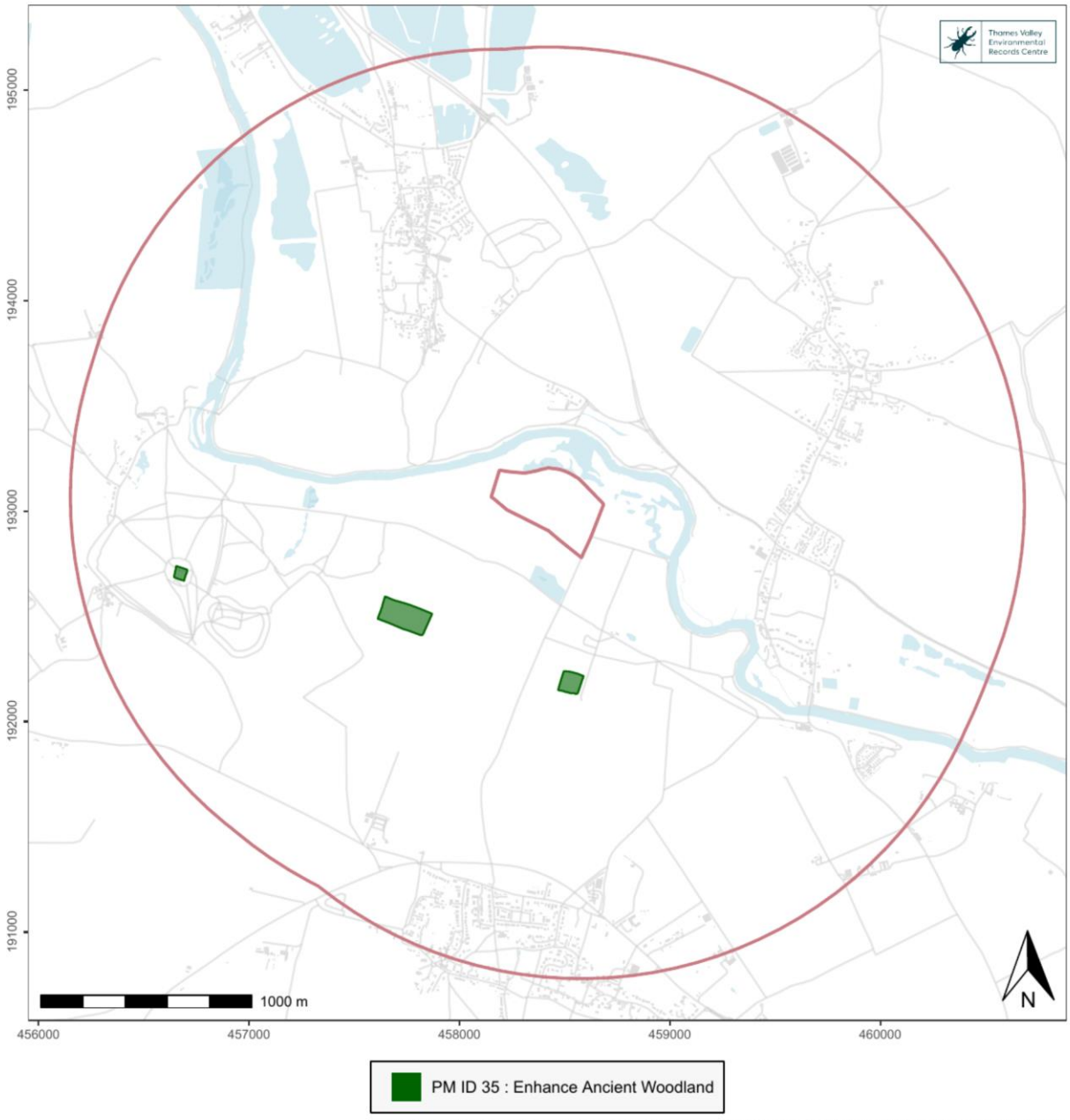
***Wider Benefits***

Undertaking ancient woodland enhancement in suitable locations can be beneficial for a variety of wider environmental benefits including: food production (wild), wood production, recreation and leisure, aesthetic value, interaction with nature, sense of place, flood protection, erosion protection, water quality regulation, carbon storage, air quality regulation, cooling and shading, noise reduction, pest control, and pollination.

## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 35 : Enhance Ancient Woodland
2km search area



## Oxfordshire Potential Measure 23: Enhance Wood Pasture & Parkland

Part of a series of mixed habitat measures, including measures for wood pasture, parkland, orchards, and open mosaic habitats.

There is **2.6 ha** of Potential Measure ID 23: Enhance Wood Pasture & Parkland within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Wood pasture and parkland is land that has been managed through grazing. They can be ancient, or of more recent origin, and occur in regions with distinct woodland types, such as Caledonian forest. Some started as medieval hunting forests or wooded commons, and others are the designed landscapes from large estates. They are often perfect for spotting ancient and veteran trees.

Trees in wood pasture and parkland are often pollarded. This is an ancient form of management where trees are grown within grazed pastures. The crown was regularly cut at around eight feet high, above the browsing height of the stock below. This allowed the land to be used for both grazing and to provide useful material from the trees.

Wood pasture and parkland sites are often made up of a mixture of habitats, from denser wooded groves to more open areas. Ancient wood pasture and parklands have accumulated the 'old-growth' characteristics that are missing from many enclosed woodlands. These include old trees and large pieces of decaying wood. Ancient and veteran trees are full of nooks and crannies, holes and dead and rotting wood. They offer a range of homes for both widespread and very rare species."

from Woodland Trust

### *Description*

This mapped measure indicates areas to enhance or maintain a good condition of existing wood pasture and parkland to support local species and future climates. The aim of this measure is to enhance and manage existing habitats to support biodiversity and to enhance their ecological condition.

### *Action*

Within wood pasture and parkland, manage the habitats and the trees to maximise the longevity of site-appropriate species and retain mature and large trees (including dead, dying, and decaying trees and wood in a manner that is considerate of public safety). Where trees are coming to maturity or end of life, ensure the emergence (or planting) of new, site-suitable trees within the existing habitat. This practice is designed to diversify the ages of trees present in the habitat and to ensure the possibility of future generations of veteran and ancient trees. Preferably, start allowing the growth of (or planting of) new generations before the existing mature trees are lost. Trees should be suited to the conditions of the particular location and, if planted, should prioritise diversity and resilience to future climates.

Maintain the grassland within wood pasture and parkland areas using suitable, extensive grazing or cutting regimes. Where appropriate the grassland component of this habitat can be floristically improved by overseeding and/or plug planting. In appropriate locations consider the creation of cover to encourage habitat variety through rabbit grazing and disturbance.

Within these habitats, scrub can play an important role as part of an overall mosaic and supports certain stages of lifecycles for different species. Look for opportunities to create and manage scrub if appropriate to the site conditions.

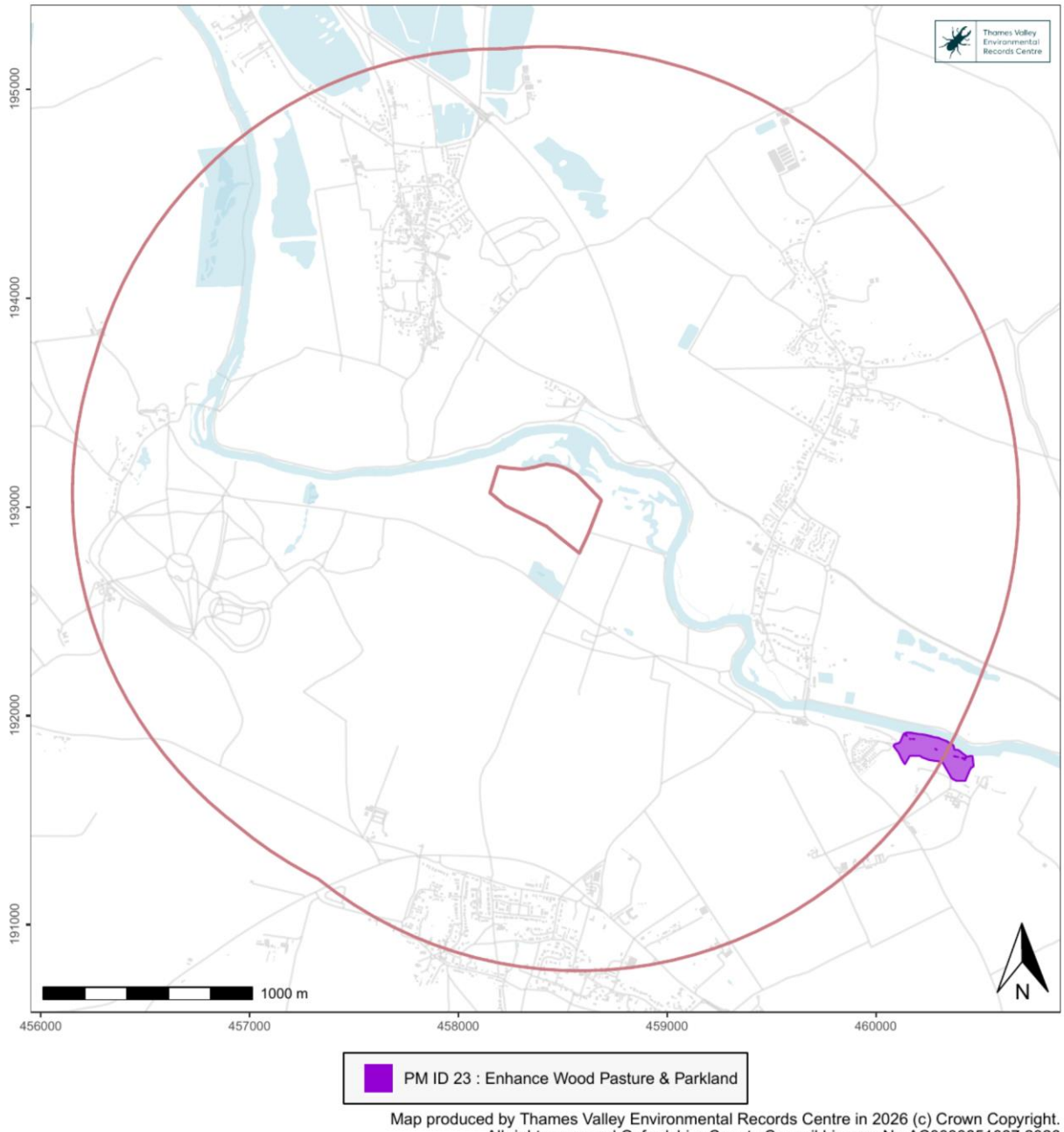
### ***Wider Benefits***

Undertaking wood pasture and parkland enhancement in suitable locations can be beneficial for a variety of wider environmental benefits including: food production, wood production, recreation and leisure, aesthetic value, interaction with nature, sense of place, carbon storage, air quality regulation, cooling and shading, pest control, and pollination.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 23 : Enhance Wood Pasture & Parkland
2km search area



## Oxfordshire Potential Measure 10: Enhance Calcareous Grassland

Part of a series of grassland and scrub habitat measures.There is **2.19 ha** of Potential Measure ID 10: Enhance Calcareous Grassland within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Famous for its floristic richness (there can be over 40 species per square metre of turf) and its rare and beautiful butterflies, this habitat is mostly found on the low chalk or hard limestone hills of southern England and along the wilder coastal cliffs and headlands of limestone country in the west of England and in Wales. Traditionally sheep grazed, the typically short and open turf, well-drained conditions and sunny climate also make it suitable for invertebrates, and there are hundreds of rare species associated with the habitat. Scrub is typically present and includes lime-loving species such as guelder rose, dogwood and burnet rose, in addition to hawthorn and blackthorn, and occasionally juniper. The scrubby grassland margin tends to be less well-grazed, and supports species not found out on the open grassland, such as common calamint and the great green bush-cricket."

from The Wildlife Trusts

### *Description*

This mapped measure indicates areas to enhance or maintain a good condition of existing calcareous grassland. The aim of this measure is to enhance and manage existing grasslands to achieve and maintain species-rich grasslands that are in long-term good ecological condition.

### *Action*

Use land management techniques to improve or support grassland biodiversity, especially in ancient and unimproved grassland. Plan to maintain low nutrient levels by undertake cutting, collecting, and/or grazing of vegetation according to the broad habitat requirements whilst working to meet the specialist needs of species in the area. Where appropriate, continue hay-making practices and manage grazing of sites flexibly in response to seasonal variations in vegetation growth. See management guidance or a detailed handbook here. Ensure that a thick thatch of grassy matter doesn't develop to increase nutrients, suppress wildflowers, or create a fire risk.

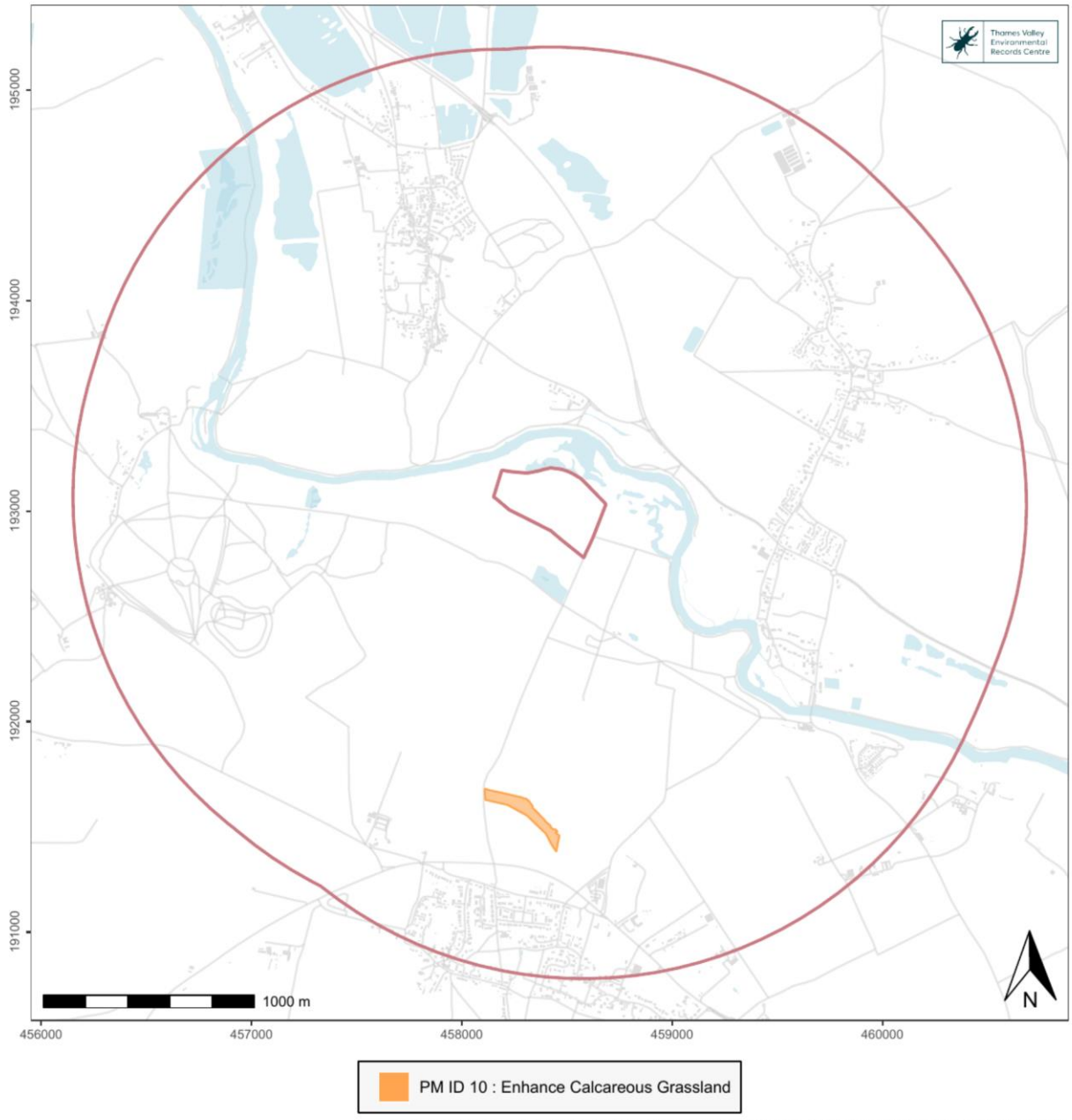
### *Wider Benefits*

Undertaking calcareous grassland enhancement in suitable locations can be beneficial for a variety of wider environmental benefits including: food production, recreation and leisure, aesthetic value, interaction with nature, sense of place, erosion protection, water quality regulation, carbon storage, pest control, and pollination.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 10 : Enhance Calcareous Grassland
2km search area



## Oxfordshire Potential Measure 78: Create & Enhance Habitats to Complement Community Use

Part of a series of wider environment measures, especially concerning villages, towns, cities, and green spaces.There is **1.69 ha** of Potential Measure ID 78: Create & Enhance Habitats to Complement Community Use within the 2km buffer.

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### *About This Habitat*

"Community green spaces include urban parks, country parks, playing fields, woodlands, green spaces between buildings, food growing areas, footpaths, and orchards – broadly termed 'environmental assets'. These spaces are complex, multifaceted places, and the best solutions and management strategies will see that complexity as a positive thing and build on it rather than reduce it."

from My Community

### *Description*

This mapped measure indicates areas for the creation or enhancement of a mosaic of habitats in a manner and size that complements the current use of the land by the local community. The aim of this measure is to enhance and create more, connected habitats and spaces for nature in Oxfordshire's villages, towns, and cities to make biodiversity and a connection with nature part of daily life and to realise the wider benefits of nature in urban areas such as urban cooling, reduction of surface water run-off, and cleaner air.

### *Action*

This action is suitable to take in and around community-use areas like playing fields, play spaces, cemeteries, golf courses, allotments, public parks, religious grounds and other community spaces or gardens.

On land used by local communities, look for complementary opportunities to enhance the area to support wildlife and create space for biodiversity. This can be done in edges and patches and doesn't have to be the whole space. Consider opportunities like planting trees, hedges, orchards, creating ponds, enhancing grassland, allowing corners of scrub to develop, and keeping deadwood in the area. Actions should complement the needs of the local community for safety and access. Think about what species are present or nearby that this space might be able to support through, for example; hedgehog highways, bird boxes, bat boxes, beetle banks, bug hotels, and more.

There are a range of organisations that can support you with this (BBOWT, CAG Oxfordshire, Wild Oxfordshire, TOE, Caring for God's Acre, and Sports England to name a few). Sports England have an action plan supported by committed funding that could be applied to local pitches (see case studies).

Whilst this is an important action across the county, actions that produce nature-rich spaces can be particularly beneficial near-to, or within, areas of public infrastructure like school, hospitals, and accessible green/blue spaces. In these spaces, the health and social benefits of nature connection

can be great. Additionally, there are particularly deprived areas of Oxfordshire (see this report, page 22) that could be a focus for these actions.

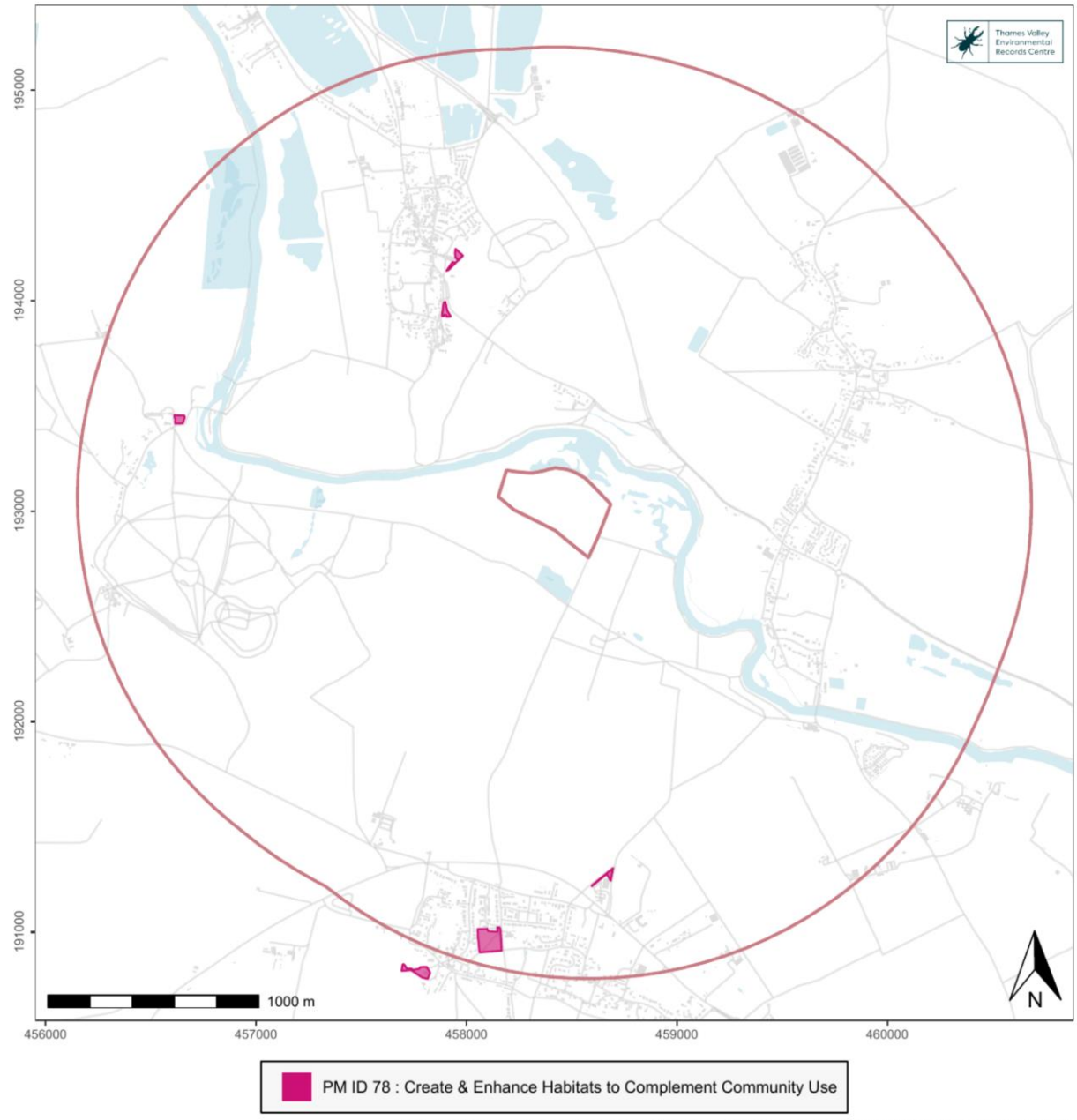
***Wider Benefits***

Undertaking the creation and enhancement of habitats to complement community use in suitable locations can be beneficial for a variety of wider environmental benefits including: aesthetic value, interaction with nature, sense of place, flood regulation, air quality regulation, carbon storage, cooling and shading, noise reduction, pest control, and pollination.

## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 78 : Create & Enhance Habitats to Complement Community Use
2km search area



## Oxfordshire Potential Measure 51: Manage Fen Buffer Areas

Part of a series of rivers, streams, ponds, standing water, and wetland habitat measures.

There is **0.21 ha** of Potential Measure ID 51: Manage Fen Buffer Areas within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Lowland fen is often found in small fragments, isolated by intensively managed farmland, but there are also more extensive areas in wetlands that have escaped drainage. The vegetation generally comprises typical wetland species such as reeds, rushes and sedges, including either tall robust species such as great fen-sedge and common reed, or a suite of small sedges such as common sedge and yellow sedges.

On managed sites, the structure of fen can be very diverse with open pools, wet hollows, mown areas, tussocky areas with deep litter and transitions to swamp and wet woodland, and this makes for a very diverse habitat. Around one third of all plant species native to the UK can be found in fens, together with half of the dragonfly species and thousands of other invertebrate species, notably beetles and flies."

from The Wildlife Trusts

### *Description*

This mapped measure indicates areas for the management of fen buffer areas to create and enhance areas of rough vegetation that help to enhance the condition of fen habitats. The aim of this measure is to enhance and manage fen habitats in Oxfordshire through appropriate management techniques to achieve good ecological condition of fens and support a wide range of (often rare) species in this irreplaceable habitat.

### *Action*

Around fens, aim to achieve a 10-metre buffer zone of rough vegetation or low earth bunds to help enhance the health of the fen habitat and/or in this buffer area, aim to achieve low/no applications of nutrients. Many fens may benefit from wider buffer areas if possible and achievable. Whilst the first 5 to 10 metres of the buffer zone has been reported as being the most important for nutrient removal, the optimum width of the buffer depends on the slope of the area, the size of the catchment, the type of soil, and the degree of enrichment. More details can be found in the fen management handbook.

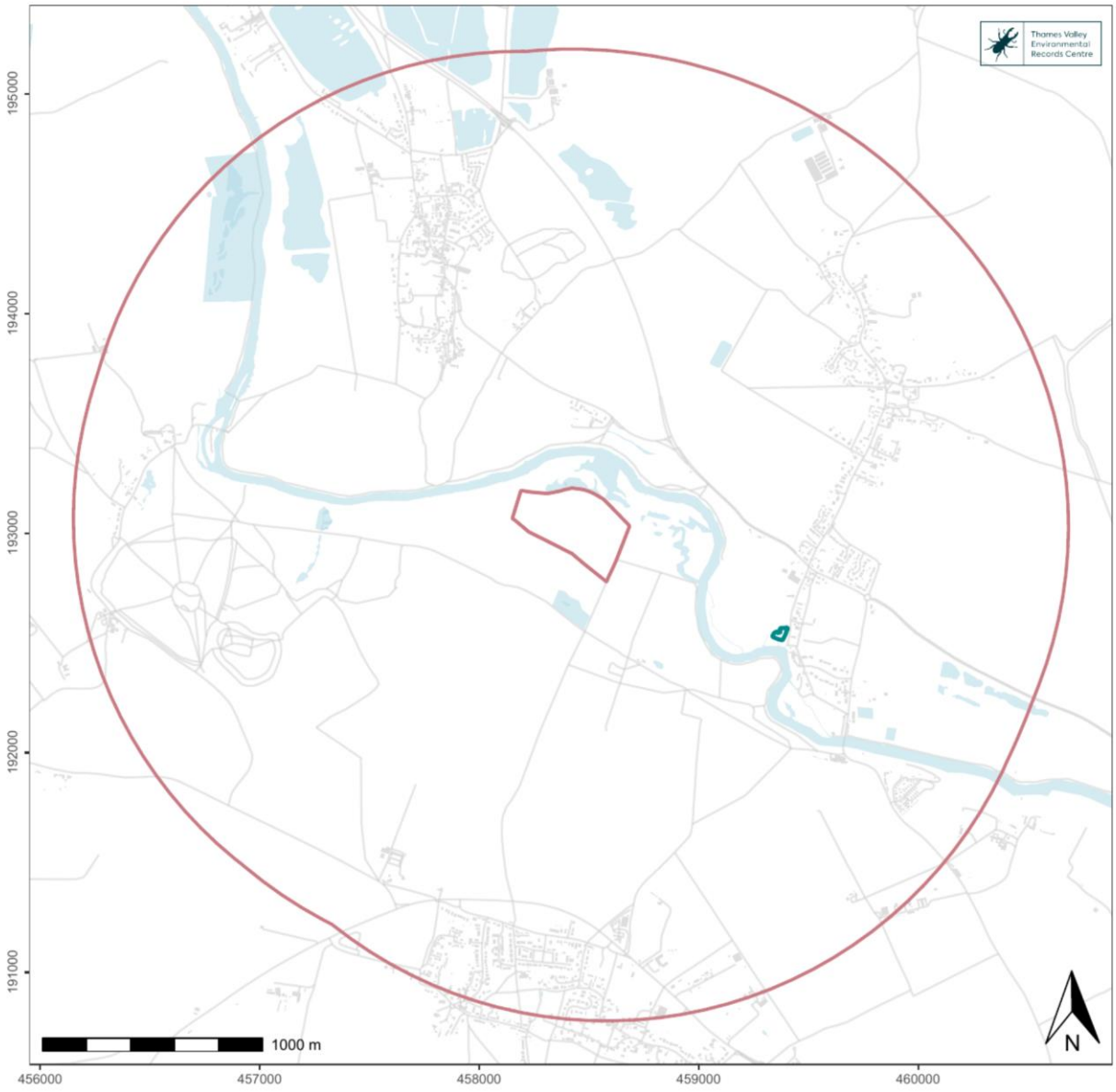
### *Wider Benefits*

Undertaking fen buffer area management in suitable locations can be beneficial for a variety of wider environmental benefits including: fish production, water supply, recreation and leisure, aesthetic value, interaction with nature, sense of place, water quality regulation, cooling and shading, pest control, and pollination.

## ***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 51 : Manage Fen Buffer Areas
2km search area



## Oxfordshire Potential Measure 50: Enhance Fens

Part of a series of rivers, streams, ponds, standing water, and wetland habitat measures.

There is **0.12 ha** of Potential Measure ID 50: Enhance Fens within the 2km buffer.

Back to Overview of Habitat Measures table

### *About This Habitat*

"Lowland fen is often found in small fragments, isolated by intensively managed farmland, but there are also more extensive areas in wetlands that have escaped drainage. The vegetation generally comprises typical wetland species such as reeds, rushes and sedges, including either tall robust species such as great fen-sedge and common reed, or a suite of small sedges such as common sedge and yellow sedges.

On managed sites, the structure of fen can be very diverse with open pools, wet hollows, mown areas, tussocky areas with deep litter and transitions to swamp and wet woodland, and this makes for a very diverse habitat. Around one third of all plant species native to the UK can be found in fens, together with half of the dragonfly species and thousands of other invertebrate species, notably beetles and flies."

from The Wildlife Trusts

### *Description*

This mapped measure indicates areas for the enhancement of existing fens through appropriate management and restoration to achieve good ecological condition. The aim of this measure is to enhance and manage fen habitats in Oxfordshire through appropriate management techniques to achieve good ecological condition of fens and support a wide range of (often rare) species in this irreplaceable habitat.

### *Action*

Fens are an irreplaceable type of habitat and they are only possible on unique geology types that happen to be found across Oxfordshire making this county a national hotspot for fen habitats. However, many fens have been lost as land use changed, management stopped, and scrub and woodlands took over. Most of the known remaining fens are in poor condition and require focused effort to recover their condition. Oxfordshire's fens support a range of particularly rare species which are at risk of becoming extinct from the UK.

Additionally, fens are a type of freshwater peat-forming wetland and the production of new peat is extremely efficient at pulling carbon dioxide out of the atmosphere, converting it into living plants and their dead remains into carbon-rich deposits in the soil. Restoring and maintaining habitats, particularly fens is essential if we are to maintain the effectiveness of these carbon sinks (Wildlife and Wetland Trust).

There are two types of fen habitats and they have different management needs. The two types are (1) surface water-fed fens and (2) groundwater fens (sometimes called spring- or seepage fens).

Before starting management, assess the fen type to distinguish which type it is and then plan and deliver management based on this.

For all fens, aim to allow the production of a continuous supply of deadwood (of various sizes) to benefit a range of species (invertebrates and fungal species). Consider which time of year management will be undertaken on fens based on any rare species (invertebrates, plants, and others) that are present to allow them to emerge and reproduce.

Whilst the LNRS has mapped this action onto the currently known fen locations, these measures are still a priority to deliver on any fens that are identified in the future if data changes after the publication of the LNRS (including ghost fens which occur where fens have been 'lost' to tree and scrub growth).

Oxfordshire has a number of fens that are being worked on by local people and organisations to create exemplar habitats. This includes (but is not limited to) Cothill Fen, Lye Valley Fen, and Hinksey Heights Fen. Visit Oxfordshire's Fen Project for more information.

- Surface water-fed fens typically benefit from cutting and collecting a third of the vegetation annually and cutting the next third in the following year, and so on. In this way, you manage a third of the site each year on rotation. Graze, cut, and/or rake pond marginal vegetation to ensure light, low nutrient, shallow pools and wet runnels. Additionally, scrub tends to require management to allow some but avoid taking over the fen pools. Scattered bushes and trees such as sallows can provide a valuable resource for invertebrates. This is the more common type of fen often found in floodplains with mixed, tall wetland vegetation, see detailed guidance here.

- Groundwater fed (seepage) fens rely on very low nutrient, high calcium, alkaline water from underground limestone or chalk water (aquifers). This base-rich spring-fen type is extremely rare (see UK map here) and a special habitat in Oxfordshire, found especially in the South, Vale, and Oxford City. These fens benefit from grazing or cutting (and removing the vegetation) every year to maintain a short structure that mimics historic grazing. Expert hydrological advice will benefit the management plan of these fen types, as nearby land use within the ground and surface water catchments has significant impacts on the health and condition of the fen. Groundwater fens have much rarer and at-risk plant and invertebrate species which will simply disappear if not cut every year. See the following for a detailed management and restoration guide for these fens. Freshwater Habitats Trust have an Oxfordshire Fens Project to work with communities and landowners across the county, get in touch for advice and support.

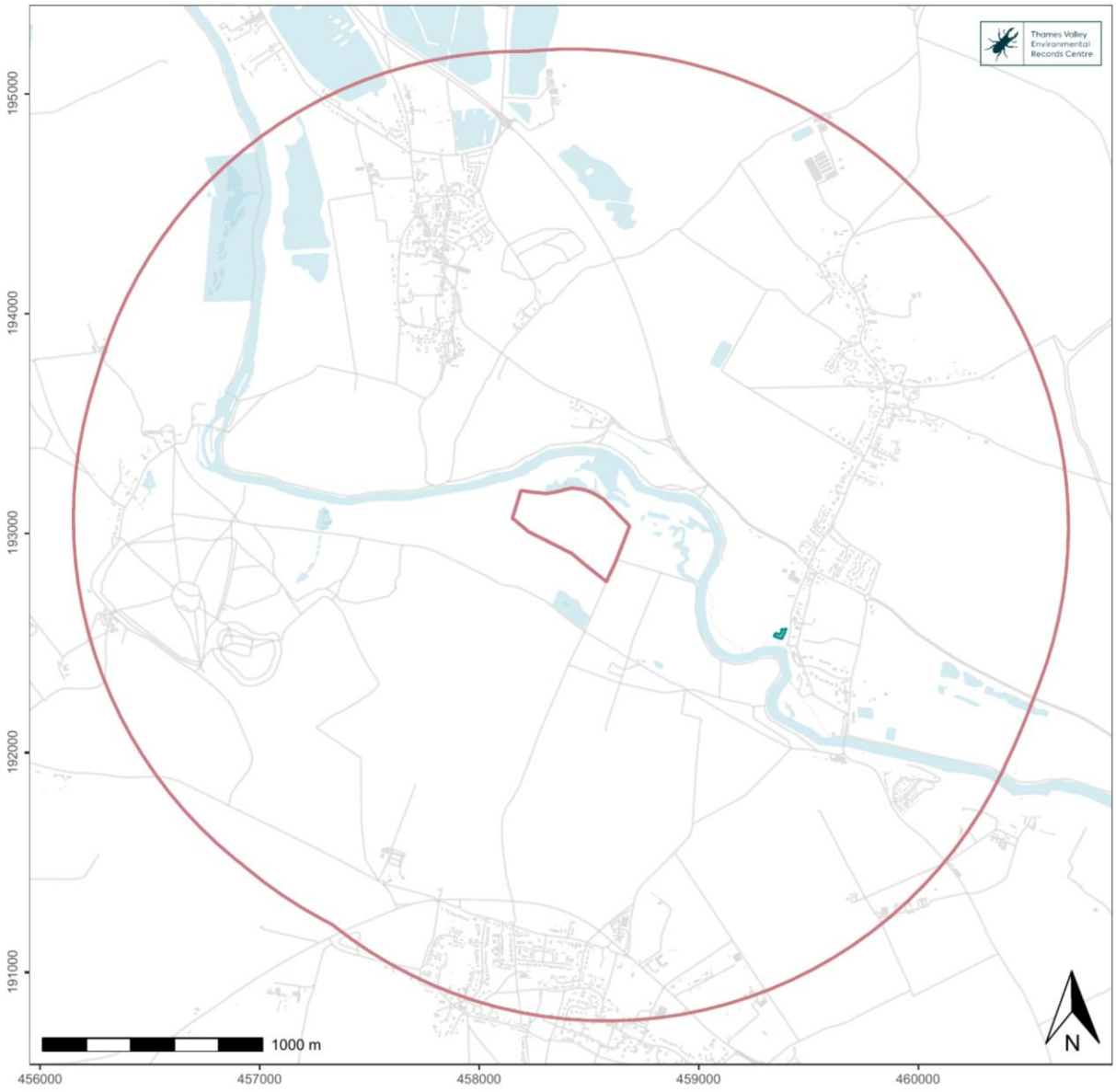
***Wider Benefits***

Undertaking fen enhancement in suitable locations can be beneficial for a variety of wider environmental benefits including: fish production, water supply, recreation and leisure, aesthetic value, interaction with nature, sense of place, water quality regulation, cooling and shading, pest control, and pollination.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map
Oxfordshire PM ID 50 : Enhance Fens
2km search area



## Recommendations for Local Nature Recovery - Species Measures

### *Overview of Species Measures*

| PM ID | Measure Name | Area (ha) in 2km | Area (ha) in site boundary |
|---|---|---|---|
| 223 | **Take action for White Letter Hairstreak** | **85.08** | **3.34** |
| 249 | Take action for Water Vole | 34.04 | 0.00 |
| 252 | Take action for Devil's-bit scabious | 263.23 | 0.00 |
| 250 | Take action for Black Poplar | 100.68 | 0.00 |
| 220 | Take action for Small Blue butterfly | 86.07 | 0.00 |
| 241 | Take action for spider species Tuberta maerens | 42.12 | 0.00 |
| 212 | Take action for Willow Tit | 39.21 | 0.00 |
| 226 | Take action for fish | 33.62 | 0.00 |
| 207 | Take action for Nightingale | 6.40 | 0.00 |
| 234 | Take action for dung specialists | 5.31 | 0.00 |

## Oxfordshire Potential Measure 223: Take action for White Letter Hairstreak

Retain Elm trees for White Letter Hairstreaks and plant or grow new disease- resistant Elms, especially within 2km of existing Elm woodlands.There is **3.34 ha** of Potential Measure ID 223: Take action for White Letter Hairstreak within your site boundary and **85.08 ha** within the 2km buffer.

Back to Overview of Species Measures table

### *About This Species*

The White-Letter Hairstreak still remains in small populations where elms are present including large, isolated elm trees and hedgerows, scrub, and woodland rides or edges which contain elm. Many butterflies have been lost over recent decades during the period where many Elms were lost to Dutch Elm Disease. Elm is now a relatively rare tree species and these butterflies need targeted action around remaining or newly planted Elm sites in Oxfordshire to expand and/or connect butterfly populations.

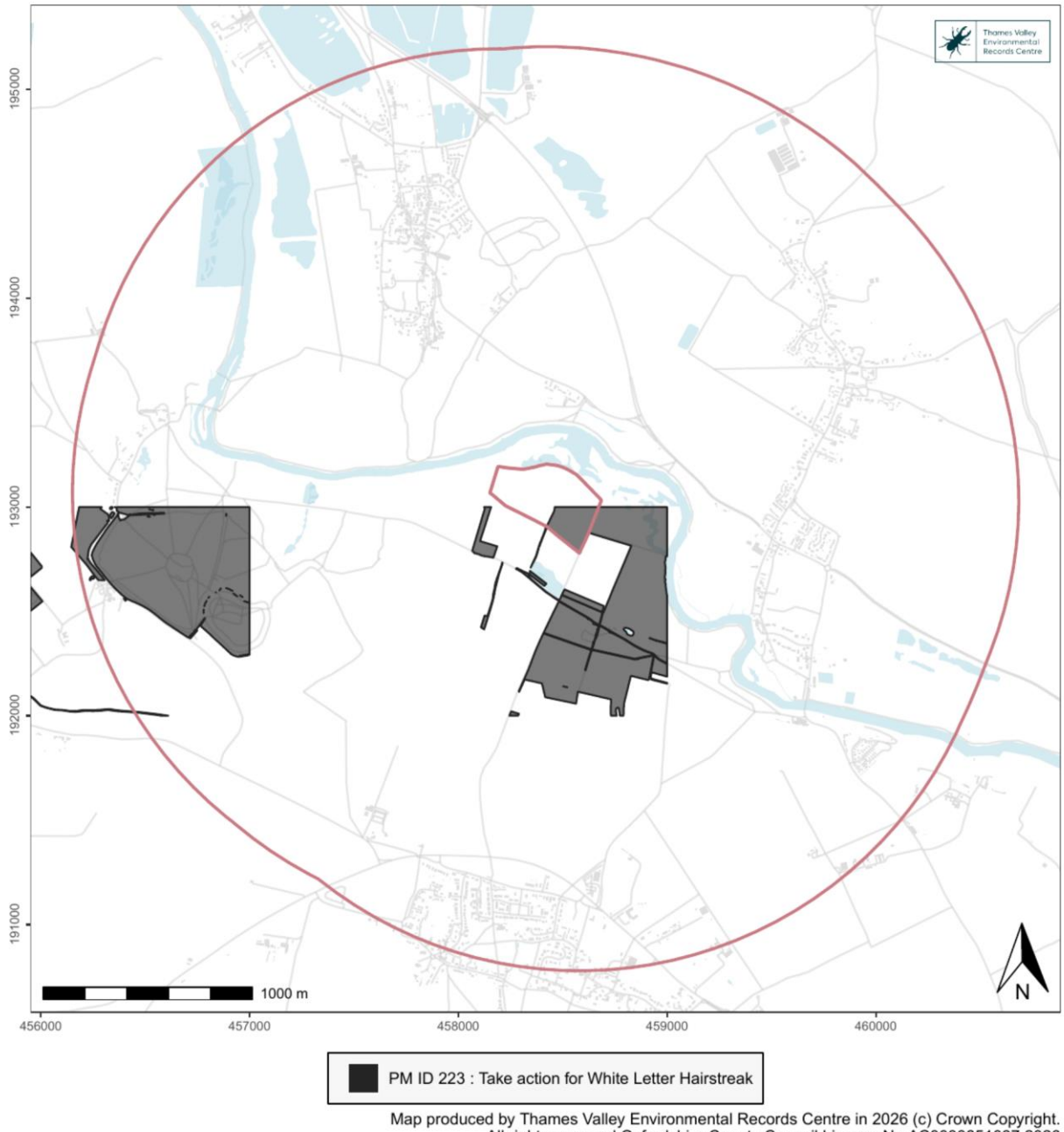
### *Action*

Do not fell mature, healthy Elm trees as a precaution against Dutch Elm disease. Allow Elm suckers to grow where they appear. In areas where scrub or woods show evidence of Dutch Elm disease, introduce coppicing on a 10-year cycle. Manage hedgerow shelterbelts that contain elm and avoid cutting edges where new elm suckers appear. Enhance rides and glades and create extensive ride and glade networks within woodlands. Connect habitats with hedgerows containing Wych Elm (Ulmus glabra) as a hedging plant and disease-resistant elms as hedgerow trees.

***Map***

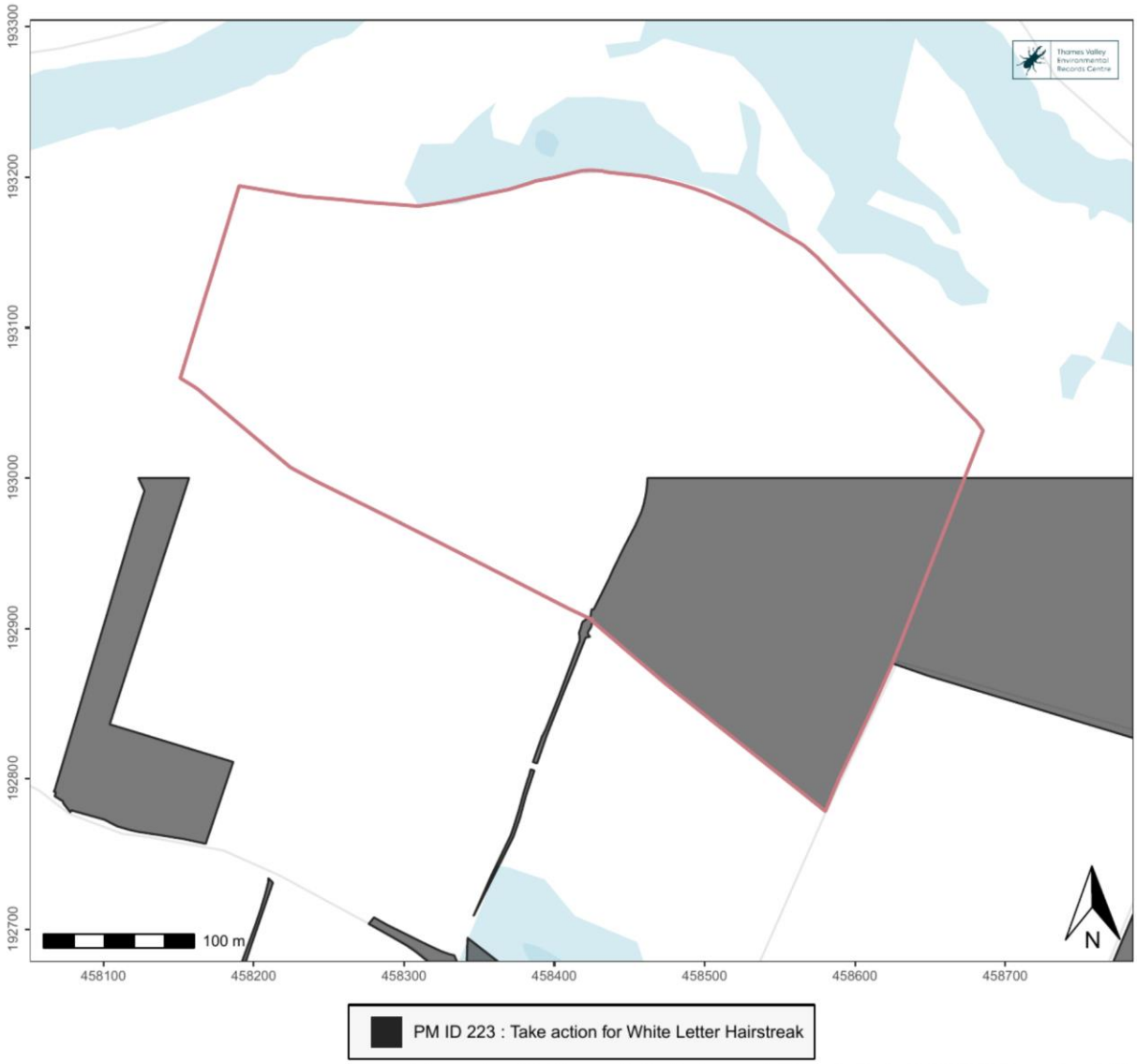
TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 223 : Take action for White Letter Hairstreak
2km search area



# TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 223 : Take action for White Letter Hairstreak
Site boundary



## Oxfordshire Potential Measure 249: Take action for Water Vole

Manage (or enhance) riverside banks, ditches, and watercourses for Water Voles.There is **34.04 ha** of Potential Measure ID 249: Take action for Water Vole within the 2km buffer.

Back to Overview of Species Measures table

### *About This Species*

Water voles have experienced drastic declines in the UK. Their numbers dropped by almost 90 per cent between 1989 - 1998 but water voles can still be found in the banks and waters of Oxfordshire's fens, rivers, streams, and ditches.

They are most commonly found in areas of slower flowing water with abundant vegetation and steep sided banks (for burrowing into) that have small ledges at their base. Effort should be made to improve habitats where the remaining populations could be joined up with each other.

### *Action*

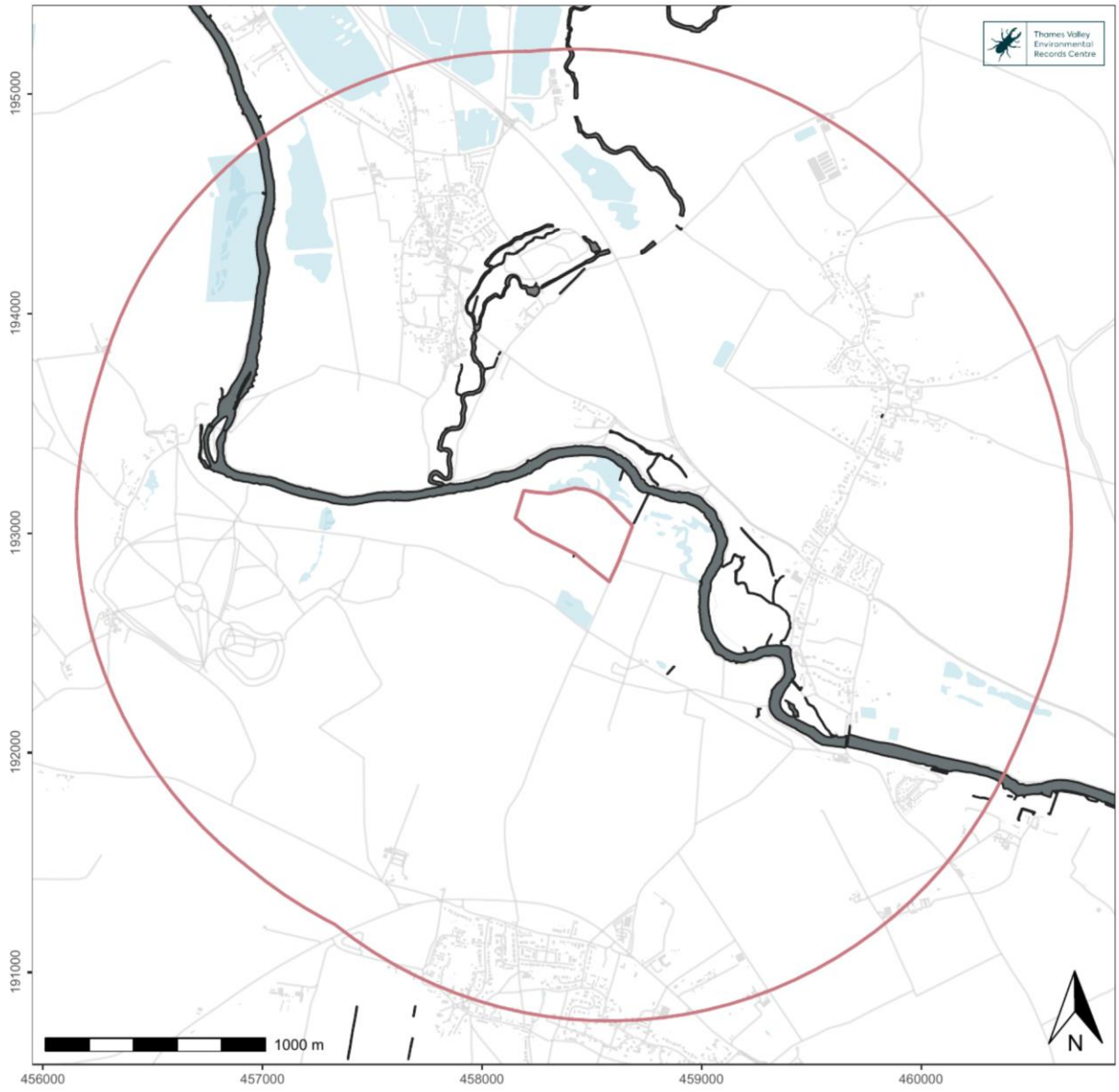
This action can be to support existing Water voles, or to create suitable habitat for new water voles to colonise. Manage riverside banks, ditches, and watercourses to create or maintain areas of sunny shallow water margins with marginal and bankside vegetation and avoid excess or extensive overshadowing of the water by scrub or trees (especially if water vole colonies are already present). Avoid trampling or intensive grazing along the watercourse edge which can damage water vole burrows. Ensure that American Mink are being controlled with the aim to achieve their exclusion where water voles are present.

Alongside improved bank and ditch management, it is key to control the (invasive species) American mink which predate on water voles in an unsustainable manner and cause local extinctions which have driven the decline of this species. Water vole recovery is primarily based on whether the efforts to control American Mink are successful. Mink were introduced to the country and are the primary cause of the decline of water voles. Water vole projects, like that of BBOWT, bring together habitat restoration and mink management and have played a major role in safeguarding Oxfordshire populations. Improved monitoring and trap-alarm systems now provide an opportunity to create a mink-free Oxfordshire if sufficient resource and support can be found. To support Water Voles, see management factsheets, conservation handbooks for water voles, advice for landowners, and advice for planning decisions.

***Map***

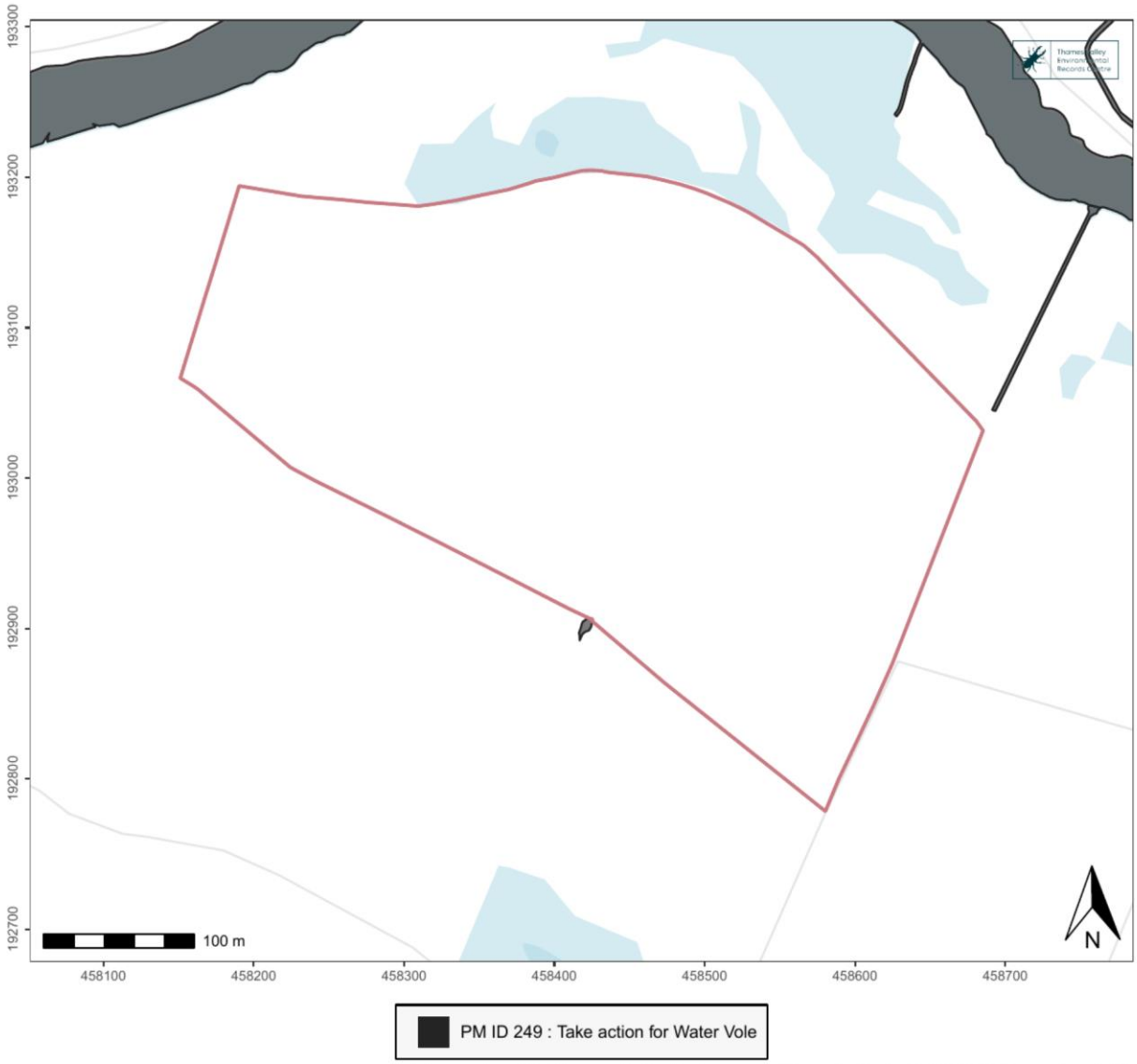
TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 249 : Take action for Water Vole
2km search area



# TVERC/25/0000 Example

LNRS Potential Measure Map − Species
Oxfordshire PM ID 249 : Take action for Water Vole
Site boundary



## Oxfordshire Potential Measure 252: Take action for Devil's-bit scabious

Enhance existing areas of Devil's-bit scabious and create new large areas in suitable, large habitats. In suitable sites, reintroduce Marsh Fritillary butterflies.There is **263.23 ha** of Potential Measure ID 252: Take action for Devil's-bit scabious within the 2km buffer.

Back to Overview of Species Measures table

### *About This Species*

To support this butterfly, Devil's-bit Scabious needs to be retained on large sites including adequate areas retained throughout winter. Extensive grazing regimes are ideal to support this. Devil's-bit Scabious creates no seedbank which is why it requires regular, consistent management to maintain its populations and avoid losing both the species mentioned here.

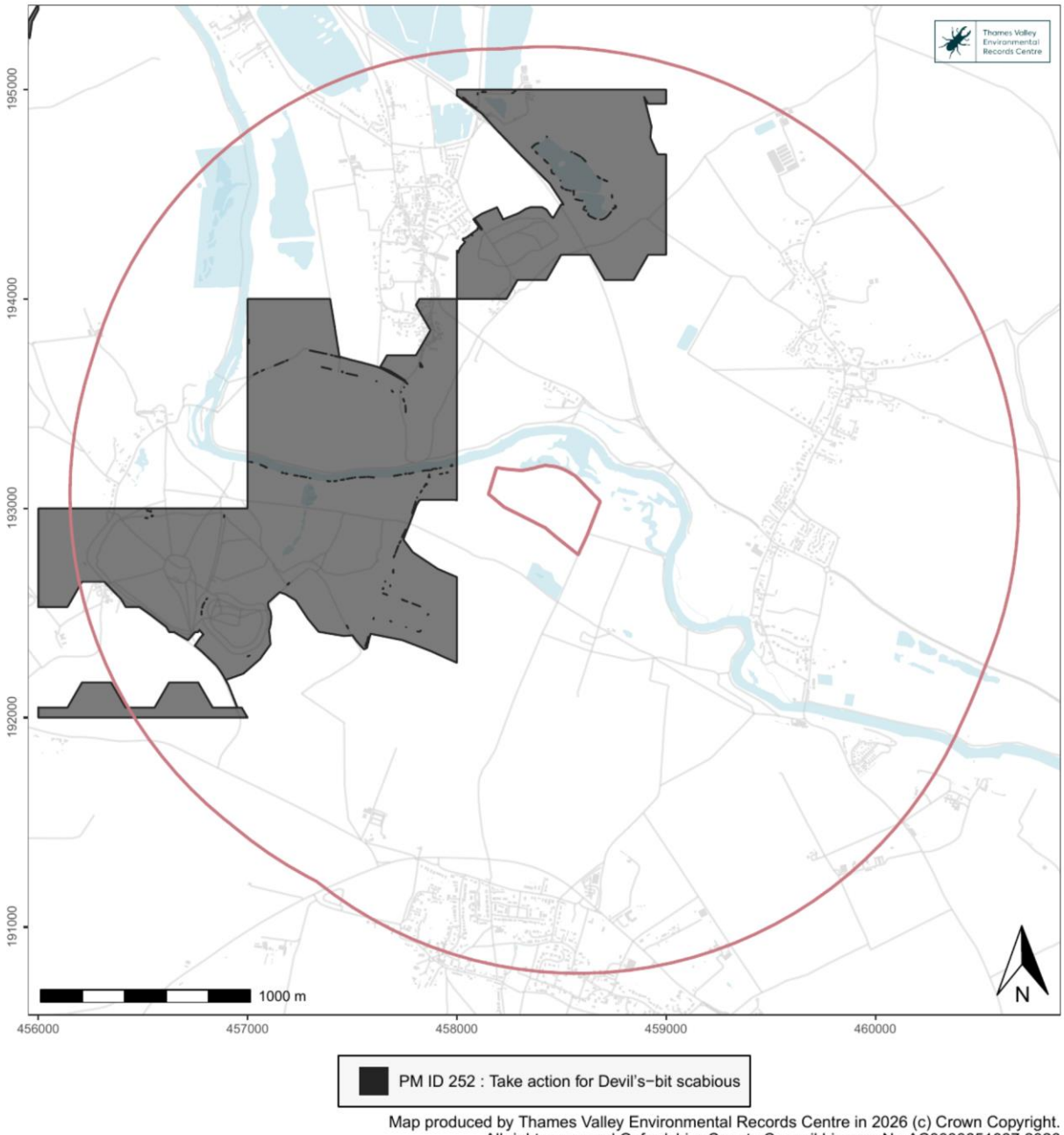
### *Action*

Propagate, plant, and establish Devil's-bit Scabious to create extensive patches of this plant (throughout the year, including winter) and introduce or maintain appropriate grazing or other suitable techniques that support this plant species. Where suitable, reintroduce Marsh Fritillary butterflies to areas which have very large populations of Devil's-bit Scabious. The Marsh Fritillary butterfly has become locally extinct due to habitat loss. It relies on well-managed, very large areas of grassland (e.g. wet meadows and calcareous grasslands) which contain Devil's-bit scabious and are appropriately grazed. Guidance suggests that good habitat should exceed 70 hectares with at least 20 per cent of the area containing three or more Devil's-bit scabious plants per square metre.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 252 : Take action for Devil's-bit scabious
2km search area



## Oxfordshire Potential Measure 250: Take action for Black Poplar

Plant or enable Black Poplars to grow in Oxfordshire and retain dead and dying poplars where they have been growing. Retain deadwood where possible.There is **100.68 ha** of Potential Measure ID 250: Take action for Black Poplar within the 2km buffer.

Back to Overview of Species Measures table

### *About This Species*

Black poplar trees used to be commonplace across England but are now few and far between. The black poplar is considered to be Britain's rarest tree species associated with wet woodland and forested floodplain. One cause of the decline for this wetland tree was the extensive draining of agricultural land across the country. Now that there are so few black poplars left, it is unlikely that they can pollinate each other due to the distance between the trees. Careful propagation and planting should be undertaken to grow male and female black poplars close to each other where their seeds can land on damp ground. In this way, population numbers may start to recover.

Oxfordshire used to have strong populations of this tree since it grows particularly well in wetlands, floodplains, and near ditches. The tree itself supports a wide range of other rare species

### *Action*

Efforts to plant new black poplars could be targeted near to the remaining black poplar trees in Oxfordshire as well as other wetland sites in the county that are suitable to support the growth of new black poplars.

See a Black Poplar action plan here.

Avoid removing or burning the deadwood of any remaining black poplars where practicable and possible (accounting for public safety and access).

A local initiative to restore black poplar populations would greatly support the recovery of these trees. Examples include projects for native Black Poplars in Herefordshire and Dorset often offering free trees to expand the UK's populations.

### *Wider Benefits*

This deadwood itself offers a very rare habitat to other species which are at risk of extinction like the true fly (Solva marginata) which breeds under the bark of live, dead, and dying poplars. It requires dead, dying, and rotting poplar trees to be kept in the environment, not removed or burned. For this species it would be particularly beneficial to plant new suitable poplar species in locations near to mature, dead, and dying poplars to ensure a local new source of aging poplars.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 250 : Take action for Black Poplar
2km search area

## Oxfordshire Potential Measure 220: Take action for Small Blue butterfly

Create and manage wide field margins and sheltered grasslands to contain Kidney Vetch (Anthyllis vulneraria) on low nutrient soils which get disturbed, to support Small Blue butterflies.There is **86.07 ha** of Potential Measure ID 220: Take action for Small Blue butterfly within the 2km buffer.

Back to Overview of Species Measures table

### *About This Species*

The Small Blue is England's smallest resident butterfly and requires habitat management to recover their numbers in Oxfordshire.

Oxfordshire is reported to have local populations which are declining but this species is expected to be able to recover if suitable habitats are created and maintained.

### *Action*

See this guide about creating bare ground for butterflies

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 220 : Take action for Small Blue butterfly
2km search area

## Oxfordshire Potential Measure 241: Take action for spider species Tuberta maerens

Create new areas of connected coppice with standard trees including oaks (Quercus robur) especially in and around Brasenose Wood, to support the spider (Tuberta maerens).There is **42.12 ha** of Potential Measure ID 241: Take action for spider species Tuberta maerens within the 2km buffer.

Back to Overview of Species Measures table

### *About This Species*

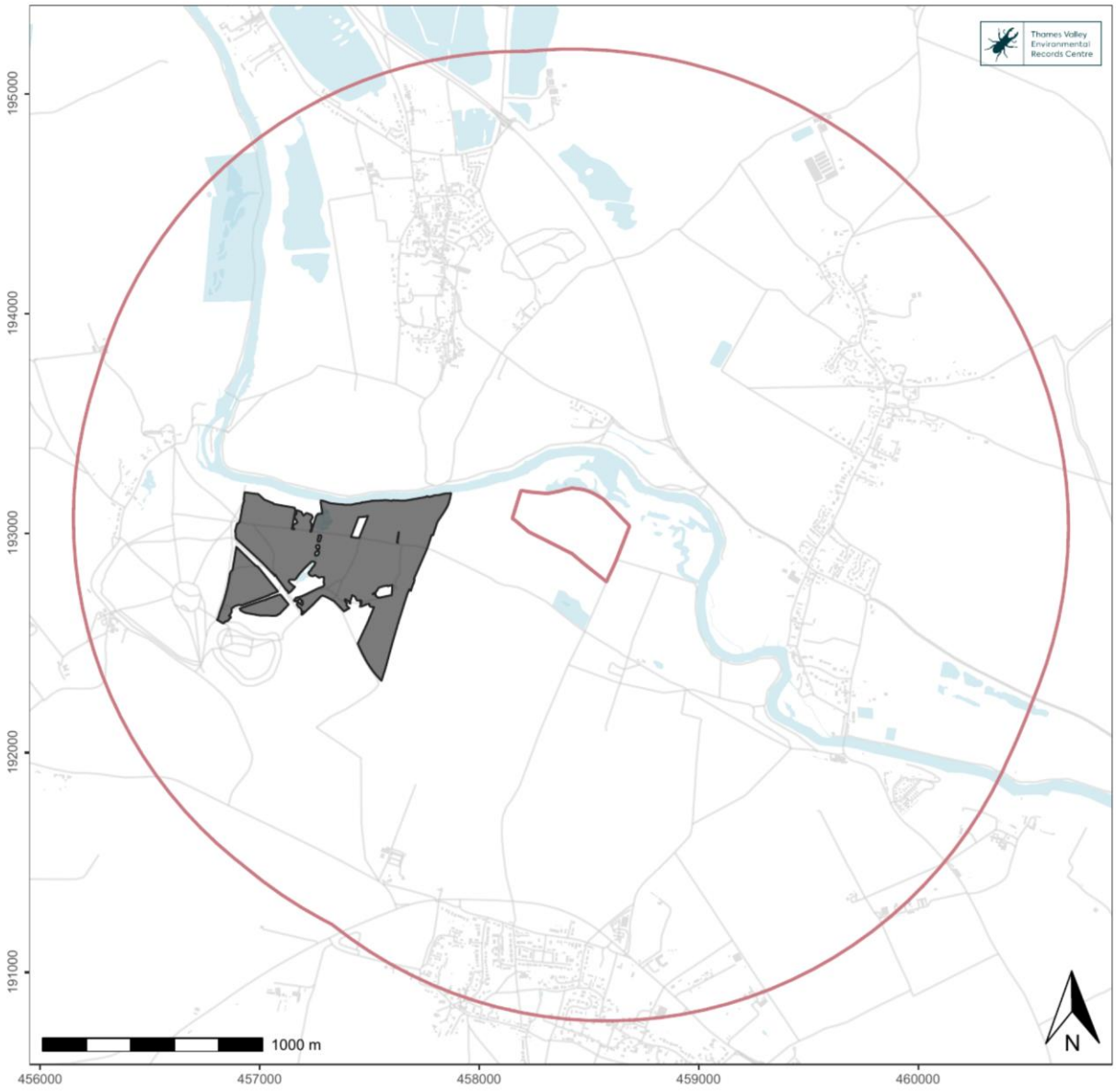
This spider is reported to be highly specialised to managed habitats and its range is greatly limited to Oxfordshire, Dorset, Berkshire and Wiltshire.

Whilst the exact, ideal management actions aren't fully clear, the greatest abundance of this species was associated with oak trees (Quercus robur) in a coppice-with-standards woodland 12 years after coppicing. The spiders were particularly found on the South and West facing areas of the tree trunks.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 241 : Take action for spider species Tuberta maerens
2km search area



## Oxfordshire Potential Measure 212: Take action for Willow Tit

Support Willow Tits by linking up wet woodland, dense scrub, and hedgerow habitats along river corridors with lots of deadwood and stumps.There is **39.21 ha** of Potential Measure ID 212: Take action for Willow Tit within the 2km buffer.

Back to Overview of Species Measures table

### *About This Species*

Willow Tits are found throughout the UK but are less common in the South East of England but they are present in Oxfordshire. The measures above should be considered in addition to the need for good woodland management and the creation of new wet woodlands. When creating tall deadwood stumps, the ideal trees are willow and alder with stumps at least 1.5 metres tall. Scrub growth around wet woodland should aim to achieve height of 2-4 metres and it may be necessary to control browsing animals to achieve this. Where coppicing is practiced, willow is preferable over alder. For more information, see the Willow Tit habitat guide.

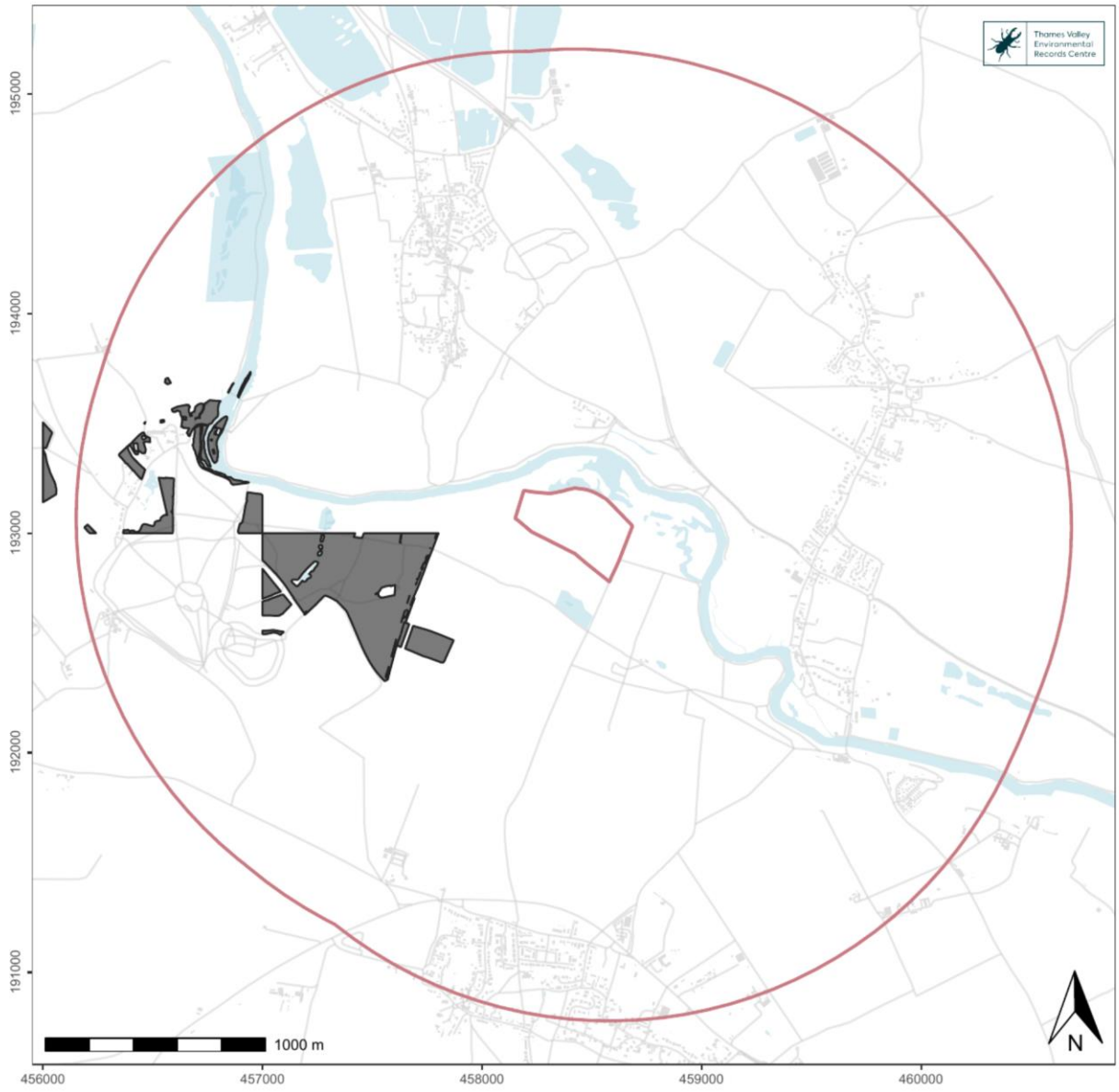
### *Action*

Retain and create a successive supply of deadwood, such as tall stumps, within and around wet woodland and scrub. Create structural diversity and promote dense scrub growth near Willow Tit nesting sites through selective felling or the reintroduction of coppicing within damp woodlands. Restore wet woodlands by reversing drainage where suitable. To improve the stability of Willow Tit populations, link up suitable habitats by creating or retaining scrub lined river corridors and mature hedgerows.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 212 : Take action for Willow Tit
2km search area



## Oxfordshire Potential Measure 226: Take action for fish

Create and maintain fish passes or remove structures within rivers to enable fish to migrate and reproduce.There is **33.62 ha** of Potential Measure ID 226: Take action for fish within the 2km buffer.

Back to Overview of Species Measures table

### *About These Species*

Eels are a migratory species which spawn at sea but grow on in freshwaters and are experiencing a major global decline in numbers including within Oxfordshire rivers in the past 30 years.

Local declines are also noted for Brown Trout and Grayling.

Alongside overall improvement to river quality and river habitat, all fish also need to be able to move through river systems to access good habitat for breeding and growing, but the legacy of the numerous structures built on rivers for milling, navigation and amenity has created numerous barriers to fish movement.

Creating fish passes (multi-species passes for trout and coarse fish, and eel passes for eels) would help fish to move between sections of river to access places to reproduce and leave their eggs.

### *Action*

Remove physical structures that blockade the river (if the blockade is currently redundant and serves no essential purpose). For structures which cannot be removed, provide bespoke fish passes at these structures along rivers to enable fish to migrate and move between river sections and to access spawning ground (to lay eggs to reproduce).

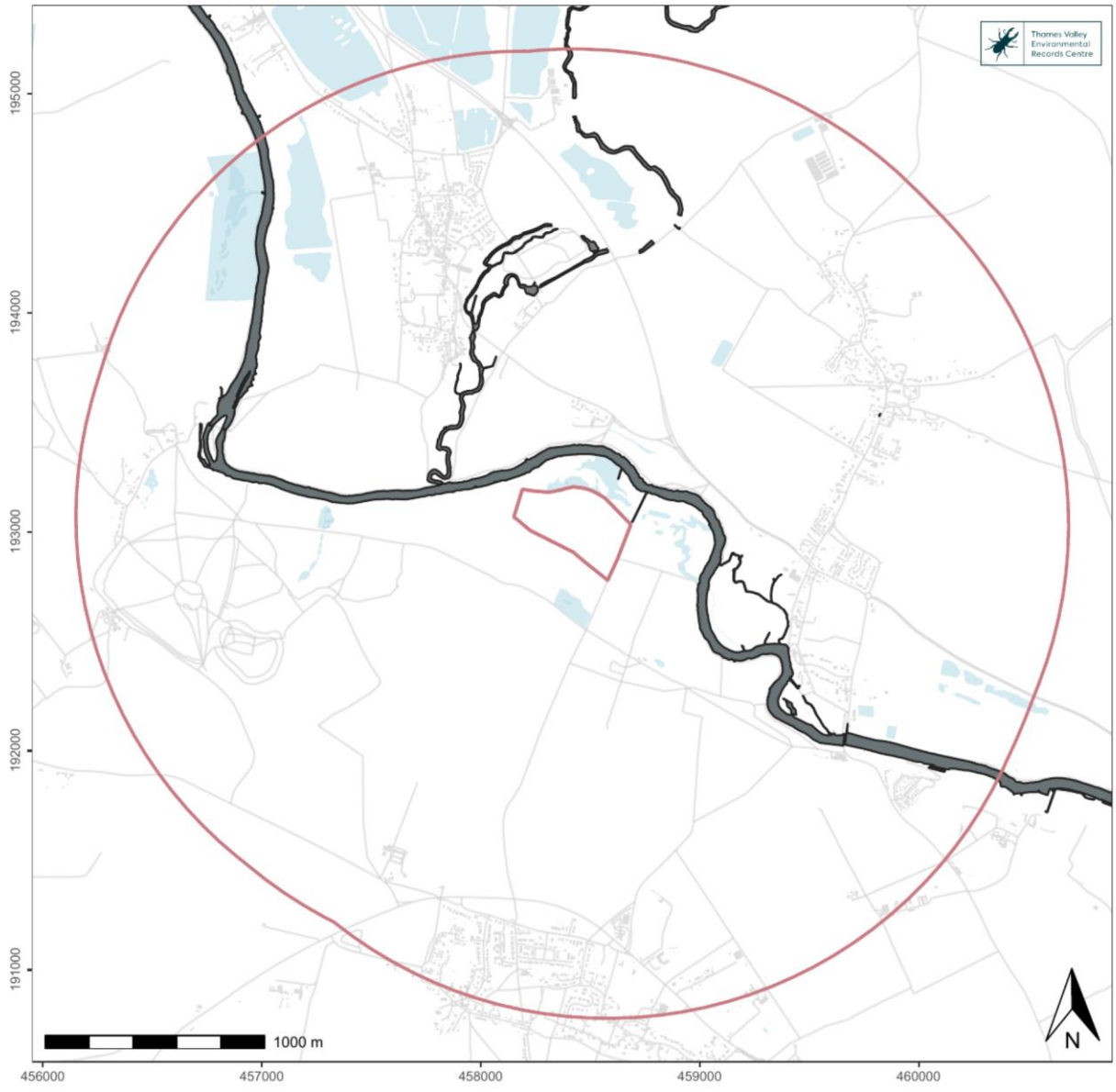
Fish passages are essential in addition to the more general restoration along more areas of modified river channels to reduce excess siltation by e.g. narrowing over-wide channels and replacing gravel beds, which will provide habitat diversity and improve spawning habitat for a greater diversity of fish species.

Contact the Environment Agency's Fisheries and Biodiversity teams who can advise on key locations to provide fish passages and river restoration. Oxfordshire's local catchment partnerships are also a valuable point of contact.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 226 : Take action for fish
2km search area



## Oxfordshire Potential Measure 207: Take action for Nightingale

Manage woodlands and scrub for Nightingales. Coppice on rotation and encourage dense layers of shrub in woodlands with scrub at the edges.There is **6.4 ha** of Potential Measure ID 207: Take action for Nightingale within the 2km buffer.

Back to Overview of Species Measures table

### *About This Species*

Nightingales fly from West Africa to the UK in April for about 3 months to breed before flying back. Numbers of breeding birds are thought to have reduced by over 90 per cent since the 1960s. In Oxfordshire, breeding Nightingales had been lost from the county for 2-3 decades but around 2020 after dedicated habitat work by MOD Bicester, nightingales returned once again, to breed in Oxfordshire. Habitat actions should be focused towards areas where Nightingale records emerge in Oxfordshire and Nightingales are also expected to benefit from countywide creation of large scrub and woodland mosaic habitats. Nightingales prefer to nest in the medium growth stage of coppiced trees (aged 4 – 10 years since they were coppiced). It takes about 7 years for scrub to be sufficiently dense for nightingale breeding. View conservation advice guide here.

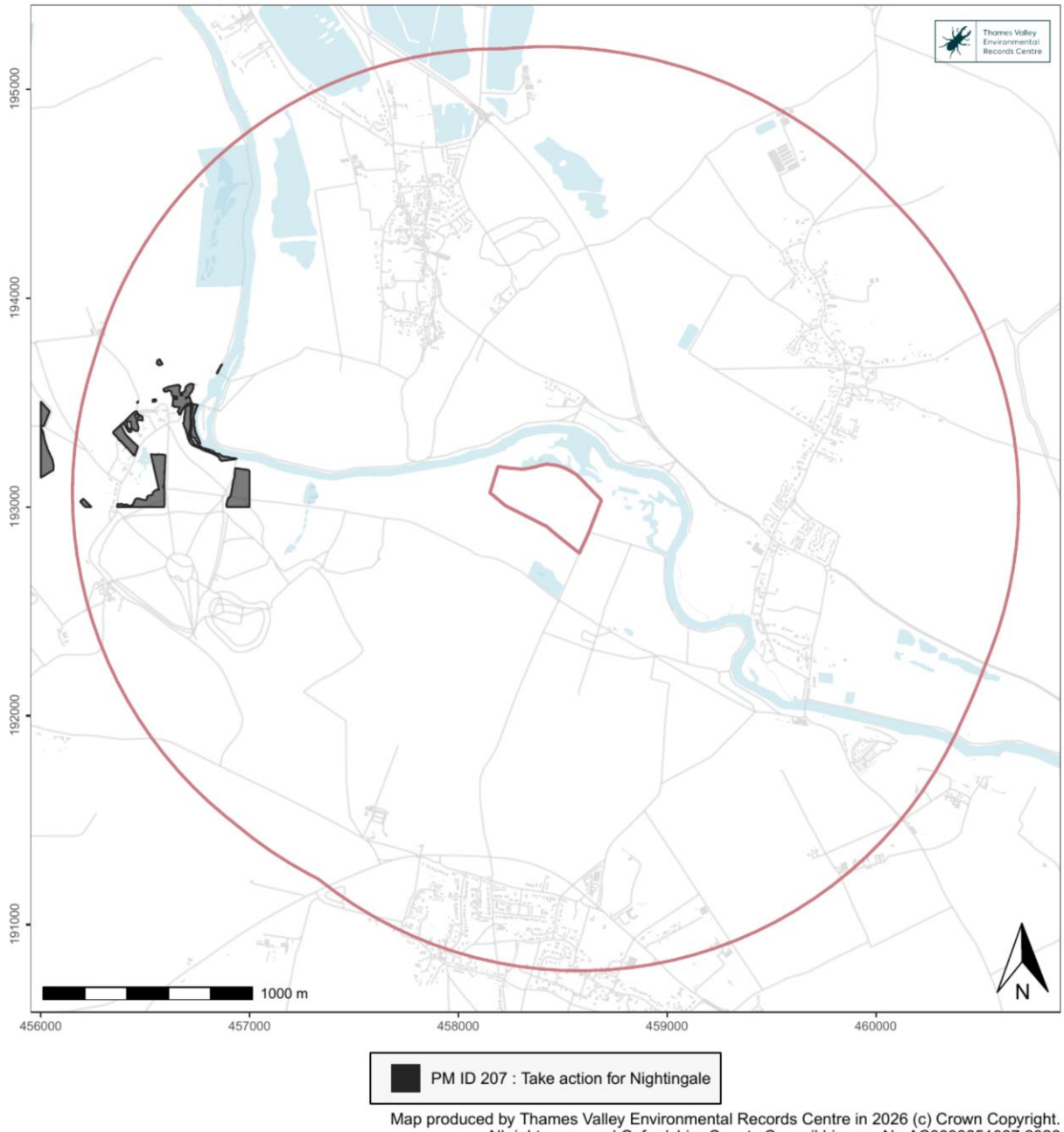
### *Action*

Introduce coppicing to woodlands and manage it so that all stages of the coppice lifecycle are always present in the woodland. To do this, coppice coupes (groups of trees) that are cut on rotation. Within woodlands, encourage dense layers of shrub to develop (including bramble) and control deer where necessary to prevent them from eating the shrub layer. On woodland edges allow dense scrub and shrubs to develop to offer feeding and nesting habitat and create woodland rides and glades that have space for a scrub zone. Re-wet woodlands to improve invertebrate presence and food supply for these birds. Connect existing suitable habitats with tall, thick hedges.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 207 : Take action for Nightingale
2km search area



## Oxfordshire Potential Measure 234: Take action for Dung specialists and dung beetles

Graze pastures with unmedicated animals to supply unmedicated dung to support rare dung specialist species and dung beetles.There is **5.31 ha** of Potential Measure ID 234: Take action for dung specialists within the 2km buffer.

Back to Overview of Species Measures table

### *About These Species*

Many beetles like dung beetles are threatened by the loss of permanent pasture (being disturbed or converted to another use), the cessation or change in routine of grazing animals, a lack or change of dung supply, and the use of parasite medications (endectocides) as a routine treatment for livestock (Natural England report). Many medications are used to keep livestock healthy. However, there is rising evidence about the negative impact of Avermectins on wildlife and the environment. The toxins build up in the dung, soil, and water with negative effects on plants and soil invertebrates like dung beetles. The dung itself also contains significant amounts of the toxin which impacts dung-dependant species. However, there are non-chemical and reduced- chemical options available to farmers, read more here.

### *Action*

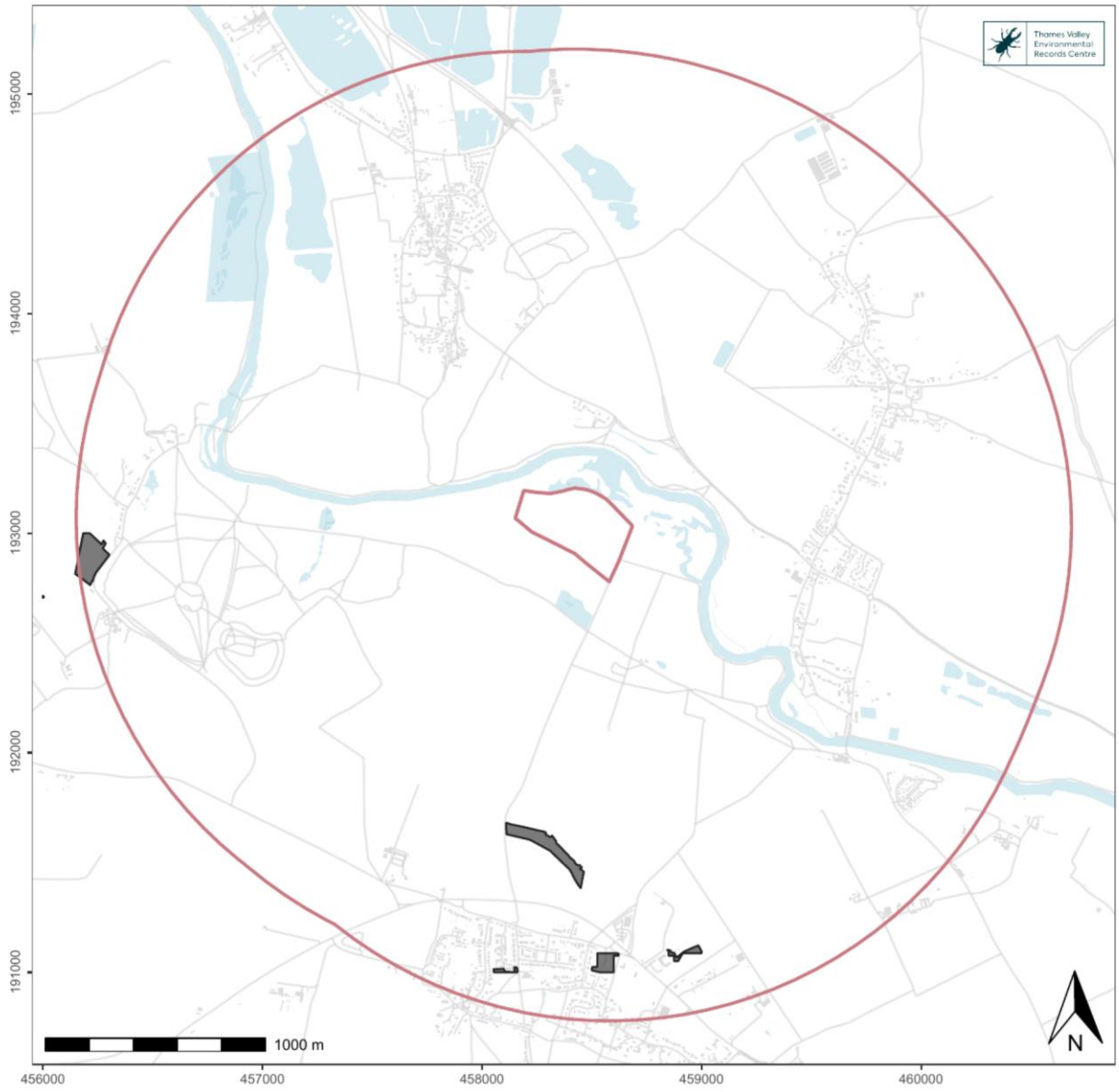
Ensure the continuation of this unmedicated grazing and management on sites where unmedicated animal grazing has been long-established and introduce it to adjacent sites. Additionally, introduce this grazing management to new sites across the county. This action particularly applies to horses and cattle not treated with anthelmintics, to produce dung that enables rare species to survive and spread including the Hornet Robberfly and dung beetles like the Violet D'Or beetle.

A paper about Hornet Robberflies and habitat management to support them can be found here with a detailed resource here. See information here about helping Dung Beetles for Farmers.

***Map***

TVERC/25/0000 Example

LNRS Potential Measure Map – Species
Oxfordshire PM ID 234 : Take action for dung specialists
2km search area



## Recommendations for Local Nature Recovery - Unmapped Measures

The Oxfordshire Local Nature Recovery Strategy includes a set of 'unmapped measures' which are additional creation, restoration, or enhancement opportunities. These broader measures can or should be taken county-wide where possible.

## Unmapped Habitat Measures

### *Countywide Measures for Connectivity and Boundaries*

***Potential Measure 2: Prioritise connectivity when creating and maintaining habitats to join up areas of nature and habitats more effectively.***

Strengthen and maintain ecological corridors, prioritise the creation of new habitats that can enable wildlife to move, feed, reproduce, and disperse across the landscape. This is particularly important between existing wildlife-rich areas.

The creation of new habitats should be prioritised in locations where they could make existing areas of habitat bigger and more joined up across Oxfordshire. This would contribute towards creating a large, functioning ecological network of diverse habitats that are fit for purpose, and which allow wildlife to move though landscapes, expand their range, and respond and adapt to climate change. Connectivity requirements should be factored into long term site management objectives. Large, connected spaces could be achieved through ambitious projects with a long-term vision (likely to involve multiple partners) and could create nationally important large nature areas, perhaps thousands of hectares in size, if possible, in one or more areas of Oxfordshire.

Connectivity can be achieved or enhanced in different ways, including (1) by creating new habitat to join existing habitats, or maintaining and enhancing existing wildlife-friendly corridors such as watercourses, canals, railway embankments, road verges, cycle ways, hedgerows, and other linear features, (2) by creating and maintaining 'stepping stones', distinct wildlife rich areas between existing, larger sites to allow species to move and disperse across the landscape, and (3) by creating, enhancing, or maintaining habitats near to existing wildlife-rich habitats to produce larger blocks of habitat.

To achieve the best outcomes, newly created habitats should look to complement the local wildlife-rich habitats and species that already exist. Habitat creation should seek to connect "like with like" and consider how species move through the landscape. New habitats could include (but are not limited to), grassland, woodlands, wetlands, open and mosaic habitats, orchards, parkland, and wood pasture.

If existing sites are made bigger and better with more links like corridors and stepping stones to enable species to move across the county, Oxfordshire will be able to pass on to future generations a network of healthier more functional ecosystems. This would benefit wildlife as the climate changes and will improve opportunities for people to enjoy wildlife.

Improving connectivity and reducing fragmentation is likely to be best achieved through co-ordination with neighbouring land managers. Some areas of the County have farmer clusters, Conservation Target Areas (CTAs) and catchment partnerships which help facilitate this approach.

Whilst this measure isn't directly mapped, the Local Habitat Map has been created with this priority built in and most of the mapped areas offer strategic places to create habitats to contribute towards this priority.

Read more about the importance of connecting England's wildlife sites, managing them, and creating more, bigger, better, joined up ecological network here.

***Potential Measure 4: Create or improve boundaries using natural products that support biodiversity.***

Where possible, improve the biodiversity value of boundaries. Where appropriate, consider replacing or enhancing existing boundaries like post and wire or rail fences with hedges, untreated wood fencing, and/or dry-stone walls. Where possible use local businesses and sustainably sourced local materials. This may not be suitable in cases where the boundaries are historic features e.g. park railings or in protected landscapes where openness is a special quality and where species such as ground-nesting birds require open conditions.

***Countywide Measures for Grassland, Scrub, and Road Verge Habitats***

***Potential Measure 13: Maintain or introduce grazing or cutting techniques that enhance the structural diversity of grasslands and support local species.***

On grasslands, including ancient and species-rich grasslands, introduce or maintain management techniques and grazing regimes that are site-appropriate using breeds that achieve a variety of sward heights and structures to benefit local species. Consider utilising traditional and rare breeds which are hardy and well suited to conservation grazing. Aim, where possible, to create patches of bare ground via periodic disturbance of the soil and turf which encourages the dispersal of many flowering plant species. Where species require short turf, cut & graze, some areas of grassland vegetation across calcareous, acid, and sandy sites to maintain a short sward and a low nutrient grassland. A similar result can be achieved by the presence of rabbits and on some sites it may be appropriate to encourage them by providing suitable cover, see more details here.

Grazing is often a good way to maintain grassland sward and to disturb the soil, typically in spring, autumn, and winter but grazing and cutting times may change based on seasonal weather patterns or particular species that you may be working to conserve. Sometimes summer grazing may be appropriate on sites that require extensive grazing.

***Potential Measure 15: Implement conservation grazing techniques that minimise or reduce the need for permanent physical fencing.***

Within pasture and grasslands or other appropriate habitats, consider approaches like regularly moving livestock through grazed areas by creating 'cells' within field parcels that you move regularly using, for example, electric wire fencing. Collar-based virtual fencing and other technology is also rapidly developing and could enable grazing animals to be focussed on particular locations and moved as needed to achieve the best conservation outcomes.

***Potential Measure 16: Create and maintain pockets of diverse scrub on grasslands as appropriate.***

Continue management that prevents excessive amounts of scrub from taking over species-rich wildflower grasslands but, where appropriate, integrate scrub creation into the site to increase structural variety to benefit biodiversity. This can be achieved through allowing occasional areas of scrub to grow as habitats within or around grasslands, to provide shade for animals, livestock,

people, and to offer food, nectar, and shelter to invertebrates, birds, and wider species. Scrub habitats on floodplains can provide a refuge for invertebrates and reptiles during prolonged flooding. Aim to allow different pockets of scrub to grow up at different points in time to create a variety of ages including the development of old scrub which supports particular invertebrate communities. Also aim for diversity of tree and shrub species, various shapes, and sizes of scrub pockets. This could be achieved through low intervention techniques (e.g. fencing an area off from browsing and/or allowing natural regeneration). Accept changes to community composition (the types and amounts of different species within your scrub growth) when driven by climate change.

It is not expected to integrate the development of scrub into ancient meadows including floodplain meadows where hay has to be taken.

***Potential Measure 19: Create new road verge nature reserves (RVNR) to allow wildflowers to grow, flower, and set seed by changing their management.***

Creating new RVNRs should be completed in safe and suitable locations where vegetation and cuttings would not block paths, roads, or lines of sight. Avoid using topsoil to create new verges, consider laying out cuttings from existing local road verge nature reserves to spread local seeds and increase biodiversity. Plan for long-term changes to the cutting pattern to reduce the number of cuts, this allows existing seeds from those places to flower and set seeds again. Ensure that enough management is undertaken to avoid any unintended scrub encroachment. You can access urban grassland and verge guidance here, find information about building community support here, and if you have an area that could become a road verge nature reserve you can propose that it becomes one here.

***Potential Measure 20: Where new roads are created assess the opportunity for new road verge nature reserves.***

Create and manage road verges, roundabouts, and other suitable spaces to promote biodiversity. The use of subsoil can create opportunities for new wildflower grasslands along new roads, while using species such as yellow rattle can potentially reduce frequency of cutting (and collecting). New grasslands need to be managed through well-timed cutting and collection of arisings. You can access urban grassland and verge guidance here.

***Countywide Measures for Mixed Habitats (Including Wood Pasture, Parkland, Orchards, and Open Mosaic Habitats)***

***Potential Measure 24: Enhance (or maintain a good condition of) existing ancient and veteran trees and the species that they support.***

Veteran and ancient trees (including those that are dying or dead) should be managed to achieve a good ecological condition, respective to their age. These trees should be managed to support important varieties of species based on the age, species, and local context of the trees. Prioritise actions that can increase the longevity of existing mature and veteran trees implementing whole life-cycle management to ensure a provision of dead and decaying wood where safe and possible, and either use natural regeneration techniques or plant new trees (of suitable species) close to existing veteran and ancient trees to provide an ecological continuity of veteran trees.

Oxfordshire is home to some exemplar ancient and veteran trees and groups of trees including at Blenheim (which is believed to have the largest collection of ancient oaks in Europe) and Ashdown Park. Many ancient trees like oaks can also be seen within hedgerows across the county and the action applies for all ancient or veteran trees.

***Potential Measure 25: Selectively create more veteran features in mature non-veteran trees where appropriate.***

Veteranisation techniques create veteran features in suitable, non-veteran trees. Identify locations and trees that may be suitable for veteranisation. Apply these techniques selectively to trees in locations where species are particularly expected to benefit from more veteran features. See more information about veteranisation here.

Using these veteranisation techniques, aim to create habitat niches in established trees that mimic the features that would normally be found in ancient and veteran trees. This can include the creation of crevices and cavities in trees, or creating canopy deadwood by selective ringbarking to mimic and produce valuable habitats that are typically found on older trees and which support a range of rare and declining species. The use of these techniques should not be seen as a replacement for veteran trees.

You can download guidance manuals about veteran trees and future veteran trees.

***Potential Measure 27: Enhance, create, or maintain a good condition of existing 'open mosaic habitat on previously developed land' (OMHPDL) to conserve and enhance biodiversity on these open, dynamic areas.***

Conserve and enhance land where open habitats of mixed scrub, grassland, and wetlands with areas of bare ground have developed on brownfield sites. Manage these sites to support species that may be present and maintain an open, dynamic nature to these areas including patches of bare ground where suitable to support invertebrates (including beetles, bees, and wasps). The creation of bare substrate as a result of minerals extraction can present an opportunity to create the mosaic of early successional communities that are characteristic of this habitat as part of the restoration of quarries. Further management guidance from Natural England can be found here.

***Potential Measure 28: Improve habitat condition and biodiversity by introducing or maintaining flexible grazing regimes where appropriate (and/or cutting and collecting).***

Where grazing or cutting is suitable and possible, maintain flexible options to be able to respond to increased variation in weather patterns, floods, and drought. Consider using traditional and rare breeds which are hardy and well suited to conservation grazing. Where necessary, protect trees from possible long-term damage that can be caused by grazing animals.

***Potential Measure 31: Create new orchards or restore orchards in areas where there used to be traditional orchards, using a diverse range of trees.***

Create orchards by planting and growing fruiting trees and plan for their management. This can be done in both urban and rural areas. Choose tree types that are well suited to the site's conditions including local or heritage varieties if possible and consider varieties that could tolerate future

climates. Orchard trees can vary by rootstock, fruit type, and variety. Where possible, aim to create a diverse orchard habitat with varieties that differ from, but complement, neighbouring orchards. Orchards should have a management plan for the long-term care of the trees as well as any species like birds or insects that are found in or near to the orchard. Additionally, outline the purpose of fruit that is produced, whether for people, biodiversity, or both. There are examples of projects that support people to create community orchards and this page contains further details. The species richness of the grassland components can also be created or enhanced using species-rich grassland creation techniques such as overseeding, spreading green hay, and/or plug planting. See a guide from Natural England about orchard creation here.

***Potential Measure 32: Create new areas that contain a mix of habitats suitable to the site to benefit wildlife.***

In suitable spaces, use natural processes of succession and techniques that mimic this to produce complex mosaic habitat types. These, ideally large, areas are encouraged to include a variety of suitable habitat types for the area, possibly including but not limited to: grazed grassland, scrub, trees, open water, wetland, rivers, and/or woodland. Consider allowing natural processes like natural colonisation of trees to create a complex mosaic of new habitats that are encouraged to be wild, diverse, and connected. Consider reducing intensive human management of habitats in these spaces and consider utilising traditional breeds and species which are hardy and well suited to conservation grazing or creating dynamic habitats that support biodiversity. The species richness of the grassland components can be increased using species-rich grassland creation techniques such as overseeding, spreading green hay, and/or plug planting.

### ***Countywide Measures for Woodland Habitats***

***Potential Measure 34: Manage populations of species that reach unsustainable levels so that existing woodlands can achieve good ecological condition to support a diverse range of species.***

This includes managing grey squirrels, deer populations, rhododendron and any invasive species or species that reach unsustainable numbers. Where possible, collaborate across land ownership boundaries to undertake effective management techniques that could control such species at a scale that could help to support the natural regrowth of woodlands and regeneration of new young trees. Consider the use of fencing, tree protection, sustainable population control, and emerging new techniques using relevant professionals or organisations.

***Potential Measure 37: Enhance and/or create areas of active, worked coppice in Oxfordshire.***

Various tree species can be coppiced on a rotation. Coppices offer important nesting and foraging sites within woodlands and can support unique and rare species. Manage existing coppices to retain flowering trees and shrubs within worked coppice compartments to benefit woodland species. Reintroduce coppicing particularly to suitable areas of historic, derelict sites where coppicing was previously practiced.

Create new areas of coppice by planting (or enabling the growth of) a variety of new trees with a plan to manage these on a specified coppice rotation e.g. long, short, or a specific cycle (usually defined by a number of years). This can take into account the need of particular species as/when they emerge.

For new and existing coppices, plan the management around any local species to best accommodate a range of species. For example, some wildlife particularly depend upon young, dense, coppices of willow, aspen, and poplar with areas that are allowed to build up deadwood and become less 'tidy' to support those species. Other coppice species include but are not limited to; lime, ash, oak, sweet chestnut, hazel and many more. Plant or retain flowering trees and dense shrub layers within worked coppice compartments to support invertebrates.

All remaining derelict coppice or existing coppice areas could be important locations to deliver this action and there are a few exemplar coppice habitats in Oxfordshire including on MOD sites near Bicester.

***Potential Measure 39: Use low intervention woodland creation techniques including natural regeneration where appropriate, especially near existing ancient woodland.***

Consider, and where appropriate opt for natural regeneration techniques as a method for the creation of new woodland habitats or mosaic habitats that include trees and wooded areas. If the site is isolated from existing woodlands and seed sources, then direct seeding could be an alternative option to establish new trees instead of planting young trees. Whilst waiting for the seeds/young trees to grow and establish, ensure they have sufficient levels of protection from grazing and disturbance to allow the woodland area to establish. If tree guards are necessary, consider effective degradable or reusable tree protection options over non-biodegradable, single-use options.

***Countywide Measures for Rivers, Streams, Ponds, Standing Water, and Wetland Habitats***

***Potential Measure 41: Improve water quality through action(s) that help to reduce or stop pollution of freshwater habitats.***

This includes but is not limited to:

1. Timely and appropriate upgrades to the sewerage network and sewage treatment,
2. Nature based solutions like constructed wetlands,
3. Working in catchment partnerships and with authorities such as Natural England and the Environment Agency to reduce surface water pollution from agricultural runoff.

This action is also of great importance in areas where people live (in both urban and rural areas) where water corridors often act as key corridors that connect areas of the environment. Water courses, lakes, and other freshwater habitats are culturally and recreationally significant to people in Oxfordshire.

To achieve widespread, good water quality, actions need to happen across the whole landscape (across catchments) anywhere where rainwater falls or where water moves on its way into the local rivers. This measure can be delivered by a range of partners and is where local Catchment Partnerships and their projects play a key role in delivering improved water quality across the county. Work with planning authorities, landowners and the water company (Thames Water) to increase the number of waterbodies in good ecological status via improving water quality. This may be through targeted, evidence-based upgrades to sewage treatment works, nature-based solutions like

constructed wetlands, or encouraging landowners to adopt water friendly farming practices which minimise run-off.

***Potential Measure 43: Restore, create and enhance marginal habitats.***

Marginal habitats on rivers are vital ecological features which can be important for much of the wildlife associated with them; ensure appropriate management of these habitats so that they are retained (often requiring no management at all), and seek to create/restore them where they are absent due to artificial vertical bank structures and steep-sided profiles, taking expert advice as to what is appropriate on a site-specific basis.

***Potential Measure 44: Manage operational canals to enhance (or maintain good condition of) habitats or wildlife corridors through Oxfordshire.***

Identify opportunities to support more species to live, forage, or move alongside canals. This could include creating or dedicating areas that are not disturbed and maintaining or restoring marginal vegetation, bank-side scrub, and/or woodland in suitable locations that don't interfere with the navigation. This will support the species that use canals as habitats and as wildlife corridors. Guidance for supporting biodiversity along canals can be found through the Canal & River Trust.

***Potential Measure 47: Enhance (or maintain a good quality of) existing reedbeds to create a varied vegetation structure that supports reedbed species.***

Well-functioning reedbeds can clean water before it enters rivers and streams and are a rare habitat type that supports reedbed-specialist species. Most reedbeds require cutting, grazing, or management of different parts of the reedbed over a cycle of e.g. 4 – 7 years to create a variety of ages and structures that support the health of the habitat and species. Normally no more than 5% of the area is recommended to be scrub or young trees to avoid losing the reedbed to ecological succession.

***Potential Measure 49: Create, improve, and manage the variety of ditches across Oxfordshire to benefit biodiversity in appropriate locations.***

Ditches vary from dry to wet and creating and maintaining ditches that hold water throughout the year holds greater value for biodiversity. For existing ditch systems, adopt best practice management measures to maximise their ecological diversity. Create new ditch habitats in appropriate locations e.g. in conjunction with the restoration of floodplain grazing marsh, and buffer ditch habitats with low-intensity land use or buffer strips in order to benefit water quality and maximise opportunities for biodiversity. See management guides and advice which recommend restoring ditch profiles (including on farms) and rotationally (not annually) managing ditches with vegetation buffers that are managed sensitively.

***Potential Measure 52: Where appropriate, retain and/or create 'fen carr', a wet woodland fen habitat that tends to be made up from 'sallow' willow species and alder.***

In appropriate locations create, maintain, or enhance fen carr habitats. Within fen carr habitats, maintain or create an open structure by utilising grazing or other suitable techniques to ensure the existence of open areas within wet woodlands. Fen carr habitats can be suitable on floodplains

which have historically held fen carr and which don't hold strong potential to become biodiverse floodplain meadows. There are situations where the retention/creation of fen carr may not be suitable, for example if the fen carr is, instead, a tree-colonised ghost spring (groundwater) seepage fen that could benefit from restoration. The initial step is to accurately identify the fen type in order to understand whether to retain/create/remove fen carr. For assistance or advice about fen carr, contact Freshwater Habitats Trust who can support with fen identification.

***Potential Measure 53: Ensure that fens in Oxfordshire retain continued, appropriate flow rates of clean water into fen habitats to support their ecological condition.***

Fens are some of the most botanically diverse habitats in England and are mainly irrigated by groundwater discharge from springs and seepages, with the water table close to the surface all year round. Without clean and consistent flows of water, fens cannot survive. Prioritise, maintain, and enhance the ecological condition of fens by ensuring a consistent flow of clean water into fen habitats. The groundwater catchment of any fen should not be contaminated with nutrient-rich water. This is particularly important for the rarer spring fens. Catchment sizes can vary for each fen and can spread hundreds of metres out from fens. The best management of the fen groundwater catchment to help clean the water supply to the spring fen by creating, maintaining, or enhancing areas of permanent grasslands like hay meadows or grazed pasture with no-inputs. You can read about fen catchment mapping in Oxfordshire here.

***Potential Measure 56: Create more reedbed habitat at suitable locations to provide habitat for reedbed specialists (often as part of larger wetland mosaics).***

Create new reedbeds in suitable locations. Reedbeds are wetland areas where common reed is dominant; looking at areas where reeds already grow is a good indicator of a suitable location. Reedbeds can filter potentially polluted water from settlements before it is discharged to rivers. This habitat type is typically found in river floodplains and can exist as reed swamp (flooded all year) or reed fen (flooded periodically). Reeds are often used to supply thatch. Often created within floodplain grazing marsh to complement the overall wetland habitat mosaic.

***Potential Measure 57: Enhance any existing fen, marsh and swamp wetland habitat areas.***

Enhance and maintain wetland habitat areas to achieve a variety of appropriate vegetation types and habitat elements that are suitable to both the area and to the source, supply, and flow of freshwater. Aim to achieve a diversity of edges, structures, and include areas of open water where suitable for the site. More information on the management of fen, marsh, and swamp habitats can be found here.

***Potential Measure 59: Create and manage biodiverse habitat alongside riverbanks to enhance biodiversity, improve water quality, and offer a corridor to enable wildlife to move along rivers, banks, and watercourses.***

Enhance habitats and biodiversity along riverbanks by creating vegetative buffers and, where suitable, plant (or allow the growth of) new trees that are well suited to the soils alongside the river (this can include but is not limited to willow, alder, birch, and poplar). Consider and plan for the future management of these trees and vegetation. This action has the ability to create a corridor of connected habitats and can often be appropriate along towpaths and pathways. This action can be

undertaken in both urban and rural settings to improve the condition and diversity of land alongside rivers and streams benefitting both people and wildlife.

### ***Countywide Measures for Deadwood Habitats***

***Potential Measure 60: Across all habitat types that have trees, retain dead, decaying, and/or dying wood in the environment where it is safe to do so (including deadwood in water).***

Aim to retain and add new deadwood (in a range of sizes and ages) into all habitat types and expose the deadwood to a range of conditions (submerged in water, wet, dry, damp, heavily shaded, partial shade, and sunny open areas).

Retain deadwood in a variety of structures; standing deadwood (upright trees, trunks, or stumps that are dead or dying), fallen deadwood (wood on the floor), and deadwood branches on alive trees. Hollows within standing trees support a wide range of species. Avoid using fungicides around these trees to allow and encourage fungal growth on this deadwood. Manage trees and branches using techniques that can enable you to regularly add new deadwood to the environment. Where necessary, reduce dead and dying tree height in stages to make the tree safe & prolong the presence of dead and dying wood in this location. Manage deadwood in accordance with any species priorities for the site.

Where safe to do so, leave dead and dying ash trees in situ. Where ash trees have to be removed, look for opportunities to retain standing deadwood and/or stumps. Implement measures to introduce veteran tree characteristics to a range of tree ages and species.

### ***Countywide Measures for Hedgerows and Hedgerow Trees***

***Potential Measure 61: Manage existing hedgerows and hedgerow trees to enhance their condition and longevity to benefit biodiversity.***

Refer to hedgerow guidance and organisations like Hedgelink. Allow hedgerows to grow to a thick and tall condition or to be laid into appropriate or traditional 'profiles' (shapes and designs). Instead of cutting all hedges annually, consider moving to a two- or three-year management regime for suitable hedgerows, or longer where possible. Where possible (on sites with lots of hedges) ensure that the 2–3-year management regime is not undertaken on all the hedges on a holding at the same time. Retain hedgerow trees for as long as is safe to do so and, where suitable, manage tree-less hedgerows in a way that allows new hedgerow trees to emerge at suitable intervals. Lay or coppice suitable hedgerows on a long rotation to regenerate them when they show signs of becoming gappy. Aim to trim hedges after berries have been taken by wintering birds and avoid hedge cutting or trimming during bird nesting periods. Retain dead, dying, and decaying wood where safe and practicable in hedges and hedgerow trees.

***Potential Measure 62: Plant, or allow the growth of, new and diverse hedgerows.***

Establish a diverse range of hedgerow species, particularly native species and those adapted to the particular location or range of climatic conditions. Plan to grow and manage hedgerow trees within the hedgerow at suitable intervals to increase the connectivity of these habitats for species. Consider planting native fruiting hedgerow species that provide nectar in spring and fruit in summer and autumn; for example, hawthorn, blackthorn, and grey willow would support a wide range of rare

species and establishing Wild Pear (*Pyrus pyraster*) could help to re-establish this rare species in the county. Plan for maintenance and management whilst the young hedgerow establishes.

Aim to enhance connectivity by planting and establishing new hedgerows so that they join up to existing habitats, especially any existing hedgerows or patches of semi-natural habitat to promote the movement of species through the landscape and offer a corridor.

### ***Countywide Measures for Invasive Species***

***Potential Measure 63: Slow, stop, and/or reverse the spread of invasive species that compromise the health of habitats in Oxfordshire.***

Support or develop initiatives and actions to control or eradicate unsustainably high levels of invasive non-native species throughout all habitat types (including but not limited to, woodlands and freshwater habitats like rivers). If eradication is not possible or appropriate, actions to reduce, slow, or stop the spread of invasive, non-native species should be supported. Actions must be in alignment with the legislation about moving/handling/disposing of species.

There is a UK Government list of invasive species which can be seen here. At the time of writing, some of the invasive species that are particularly relevant to Oxfordshire include, but are not limited to:

More information about what to do and how to record invasive species can be seen here with research and evidence available to read here.

***Potential Measure 63: Slow, stop, and/or reverse the spread of invasive species that compromise the health of habitats in Oxfordshire._bullets***

Freshwater-associated species - American Mink, American Signal Crayfish, New Zealand Pygmyweed, and Himalayan Balsam.

Woodland-associated species – Grey squirrel, Muntjac deer.

Problematic and invasive species are expected to change with future climatic variation and this action should be adapted to the specific, relevant, invasive, or problematic species at the time.

### ***Countywide Measures for the Wider Environment focused on Agricultural (Improved Grassland and Arable) and Rural Landholdings***

***Potential Measure 64: Create and manage graded margins up to hedgerows and dry-stone walls to support birds and other farmland species.***

Within fields that have hedges, provide margins that are graded in height (shortest near the field, longest grass at the hedgerow). These graded margins next to a thick hedgerow offer important nesting sites for birds including who seek long grass at hedgerow bases.

***Potential Measure 65: Create and manage wide arable field margins and in-field strips as wildflower grassland.***

Methods vary and could include rotational mowing regimes to create wide in-field strips or margins (e.g. 3 – 18 metres) which offer cover for small mammals and refuge over winter for invertebrates. Remove arisings as needed to avoid enriching the soils and to avoid losing wildflowers to vigorous grasses. Manage arable fields, their margins, and in-field strips to encourage and retain populations of arable flowers and avoid spraying these areas. Alongside increasing biodiversity in those places, field margins and in-field strips can be positioned to connect to each other within farm holdings or between neighbouring holdings to help species to move through the landscape. Wide margins are particularly important alongside water courses and ditches to reduce diffuse pollution, erosion and enhance the biodiversity of the water course.

***Potential Measure 66: Create and manage field margins to improve and increase biodiversity around fields.***

Maximise the diversity of field margins to provide a range of habitats within margins. Aim to vary management of margins to increase diversity. For example, annual cutting of the strip nearest the crop but with less frequent cutting nearer the field boundary. Variety could also be introduced by managing blocks, strips or whole margins at different intervals. In planted margins, tailor the seed mix diversity to include a variety of flowering plants that could provide continued options for pollen and nectar throughout an extended season. Include species in planted margins that are able to tolerate and flower under hotter and drier summers.

***Potential Measure 67: Create and improve areas that support rare arable plants on farmland.***

If species of arable plants are present, and if it is appropriate for those species, you can support arable plant species on any relevant soil types by disturbing or cultivating some areas of suitable soil (typically each year in autumn) and allowing arable plant seeds to grow in the following years. Minimise or stop the use of herbicides within this area.

***Potential Measure 68: Support farmland birds over winter.***

Implement measures to assist farmland birds survive across the hungry gap (mid-February to Mid-April): overwinter stubble, seed-rich winter cover crops using wild bird seed mixtures, unsprayed and unharvested arable headlands, and/or supplementary feeding.

***Potential Measure 69: Take action to improve farmland bird nesting success.***

Offer and retain nesting and roosting sites for birds including; bird boxes, trees with hollows, standing deadwood, areas of scrub, dense hedges, suitable buildings and barns (including those derelict).

***Potential Measure 70: Retain, improve, or create habitat to increase the opportunity for wildlife to move through the landscape (e.g. wildlife corridors).***

Improve the connectivity of habitats or of any permanent areas of uncultivated land that support species to move through the landscape. Aim to join up areas of habitat within farms and between neighbouring farms.

***Potential Measure 71: Across Oxfordshire's farmland, increase the biodiversity in soils by choosing cultivation practices that can regenerate species and produce healthy soils.***

Take actions and use techniques that are suitable to the farm type and location to improve the abundance and health of species that produce good quality soils (e.g. minimum cultivation, cover crops, leys, grazing techniques, and crop rotations). Measure, and aim to improve the health, abundance, and diversity of soil species.

Improving soil biodiversity will enhance the structure and quality of the soil enhancing productivity, building carbon content, and improving water retention and infiltration to help reduce runoff and leaving of soil nutrients. The actions to enhance grassland health and condition are described in the grassland section at the top of this document.

***Potential Measure 72: Plant (or allow the growth of) diverse trees of various ages and types on farmland.***

Plant trees, or allow trees to grow up, across different years (successional planting/successional growth) to broaden the age diversity of trees. This could include agroforestry, woodland, standard trees in hedgerows, scrub growth, shelterbelts, silvopasture, individual trees and/or orchards.

You could create shelterbelts (windbreaks) made up of trees to protect livestock and crops from inclement weather (see the benefits of trees on arable farms here). Alternatively/additionally, you could incorporate trees or agroforestry into agricultural systems, particularly livestock grazing systems (silvopasture), or alongside crop production (silvoarable systems). This could include trees that can produce a fruit or nut crop (see agroforestry handbook).

***Potential Measure 73: Retain and/or plant in-field trees with suitable buffer zones to ensure continuity of open grown trees (live, dead, or dying) that support species across the landscape.***

Retain existing trees within the farmed landscape, particularly veteran and ancient trees, and fence off ancient and veteran trees if necessary to protect them and their root zones from soil compaction and/or to enable new trees to grow nearby (see guidance on managing such trees).

***Potential Measure 74: Create a tailored integrated pest management plan to reduce the use of artificial fertilisers and pesticides.***

When thinking about how to manage crop pests, plants, and diseases within farmland, implement measures that can support and work with biodiversity to work with nature to produce food (for example, NFU integrated pest management plans).

## ***Countywide Measures for the Wider Environment focused on Villages, Towns, Cities, and Green Spaces***

***Potential Measure 77: Integrate wildlife-friendly measures into homes, gardens, greenspaces and developments.***

Take action to enhance these spaces for wildlife and consider key species that you could support in gardens and greenspaces. These may include birds, bats, hedgehogs, frogs, toads, bees, butterflies, and more. Consider installing bird boxes, bat boxes, swift bricks and other options that support wildlife in and around buildings where appropriate. For new homes being built, see this Wildlife Trust guide on 'Homes and wildlife - How to build housing in a nature friendly way'.

In existing gardens and greenspaces follow suggestions for 'Wildlife gardening' e.g. how to build wildlife ponds, attract pollinators, plant native shrubs, trees, and hedges. Ensure any fences or walls have 13 by 13cm holes to create 'Hedgehog Highways' that allow hedgehogs to move through gardens. See a list of hedgehog friendly fencing suppliers here. Avoid using pesticides or peat-based compost in gardens and avoid introducing potentially invasive non-native species into gardens and other outdoor spaces. Remove existing invasive species where possible. See a list of invasive plant species here.

Retrofit wildlife kerbs to existing gullies, particularly near existing nature sites, and install wildlife kerbs on new gullies as standard. This will provide safer passage for amphibians and small mammals around road gullies and drainage openings.

Reduce recreational pressure on wildlife and habitats in urban areas by maintaining clear paths, keeping dogs under close, effective control, reducing the impact of cats on wildlife, and aiming to create or enhance some areas for wildlife in areas in places where there is little-to-no disturbance.

Whilst these are important actions to take across the county, the impact of providing nature-rich spaces is likely to be highest near/within public infrastructure such as schools and hospitals where the health and social benefits of nature connection are particularly marked.

***Potential Measure 79: Create and enhance wildlife-rich corridors of suitable habitat between, through, or near settlements in Oxfordshire.***

Create new corridors or enhance existing corridors that offer room for nature and wildlife to move through towns, cities, gardens, parks, and villages and which include habitat for foraging and for resting/nesting. Consider the importance of dark corridors with minimal artificial lighting to benefit wildlife (read more about lighting and guidance here).

Corridors should ideally join up habitats and may be possible through, between, or near to settlements and could be created alongside active travel corridors, providing benefits for both people and wildlife. Such corridors may include Public Rights of Way, permissive paths, accessible walking/wheeling routes, watercourses, footpaths, hedgerows, greenways and others.

***Potential Measure 80: Ensure that actions in urban areas offer wider benefits and meet relevant green space standards.***

Whilst benefitting biodiversity, actions can also be tailored to deliver benefits for local communities, including addressing inequitable distribution of environmental determinants of health and wellbeing', and improving climate resilience. This could include innovative solutions like green (or brown) rooves, biodiverse swales, or rainwater gardens to mitigate flooding or actions such as increasing vegetation cover to mitigate excess heat through shading or to filter particulate air pollution. The Environmental Benefits from Nature Tool can be used to understand the wider benefits that might be gained or lost from changes in land use.

Where relevant and appropriate, create or enhance multifunctional parks and green spaces to ensure that residents of new (and existing) housing have sufficient access to larger green spaces (meeting Natural England Access to Green Space Standards). This should be prioritised in areas with the least local access to greenspaces, where significant housing development is expected, where local habitats and species are under pressure from high levels of use by local communities, and/or where people and homes are highly vulnerable to negative impacts such as air pollution, urban heat

island effects, flood risk, and others. See guidance in the Green Infrastructure Framework and read about the public health benefits of accessible greenspaces here. Consider opportunities to create and enhance greenways in cities to improve people's access to rivers and provide nature-rich corridors.

Design and deliver new housing developments with sufficient accessible, nature-rich spaces for residents (meeting Building with Nature Standards).

Whilst this is an important action across the county, actions that produce nature-rich spaces can be particularly beneficial near-to, or within, areas of public infrastructure like schools, hospitals, and accessible green/blue spaces. In these spaces, the health and social benefits of nature connection can be great. Additionally, 16 priority neighbourhoods have been identified in Oxfordshire(see this report, page 22) that could be prioritised for efforts to improve access to greenspace and could be a focus for these actions.

***Potential Measure 81: Increase tree canopy cover in Oxfordshire by planting and managing trees and woodlands in built up areas.***

Plant trees and/or woodlands that can cool and shade the local environment and improve air quality. These trees could also create or maintain corridors for wildlife to support species to cross the county (in both rural and urban environments). This action offers particular benefits to human health by mitigating the impact of excessive heat and filtering particulate pollutants from the air.

Planting trees and creating canopy cover in warmer areas of the county (especially urban environments) helps to reduce temperatures and increase the resilience of urban areas in the face of climate change. Planting trees between sources of particulate pollution (such as road traffic) and particularly sensitive areas such as schools, active travel corridors, and residential areas will have the most benefits for human health from improvements in air quality.

Suitable locations could include green space, gardens, parks, schools, or as street trees. When planting new trees, plan for their long-term management, and plant them strategically, aiming to create corridors of trees that connect up urban greenspaces, gardens, or other habitats. Corridors could connect either to each other and/or to the wider countryside where possible. These corridors of canopies help local species to move and join-up their populations.

Whilst this is an important action to take all across the county, this would be particularly important action to support and incentivise in built-up areas that have low tree cover, and in locations that experience particularly high vulnerability to heat or particulate air pollution. See this guide on how to select and plant urban trees, and see this new 'Trees outside woodland map' to see extent and location of woodlands and trees in England. Some of Oxfordshire's neighbourhoods have particularly low tree cover or access to green space and actions could be focused on these locations to maximise the benefits for people, health, and nature.

***Potential Measure 82: Carry out wildlife-friendly actions that also reduce flood-risk and the impact of heat in built-up areas.***

Areas of Oxfordshire are increasingly vulnerable to the effects of changing climate patterns (including flooding, drought and excess heat). There are solutions that can reduce these impacts which also benefit nature, these are called nature-based solutions.

Install more green walls, green roofs, or innovative surfaces on new or existing buildings that help to cool urban areas, catch water, and provide more space for nature. Link to further guidance.

Increase vegetation cover to mitigate excess heat through shading and intercept rainfall. Keep gardens instead of creating more impermeable hard surfaces, and where possible, remove hard-standing surfaces in favour of permeable surfaces (ideally natural, green options that also benefit wildlife). These options to retain and create more permeable space helps to soak up water, reducing the risk of surface water flooding. Read about the impact of hard surfaces and the problem with paved gardens here.

Integrate sustainable drainage systems (SuDS) to capture, hold, and manage the flow of water near built up areas and developments. SuDS are designed to manage rainfall and stormwater runoff in ways that mimic natural drainage processes and can also enhance the local ecosystem. Examples include rain gardens, mini ponds, orchards, wetlands, and balancing ponds. These SuDS features not only contribute to flood risk management but also serve to support biodiversity by creating habitats for plants, animals, and insects.

Oxford City has published a Design and Evaluation Guide to help navigate sustainable drainage options and there are national standards for SuDS here.

***Potential Measure 84: Reduce pollution and damage to the environment by changing products, behaviours, and actions.***

Support initiatives that could help to prevent damage to the environment and which contribute towards enhancing the condition of the environment (by reducing pollution into the environment across Oxfordshire, including in places where people live and work). There are a large range of actions that could be supported like preventing run-off, preventing littering, or cleaning up litter from local areas. Additionally, damage and pollution could be limited by changing commonplace habits, for example, reducing the use of chemical controls in the environment (such as herbicides), helping people to purchase products that are less harmful to the environment when put down drains, or to change sources of fuel. Some actions may focus on changes to diets or enabling people to buy more local produce. Other actions could include increasing healthcare options: for instance, offering more green social prescribing treatments to people, which can reduce the amount of pharmaceutical pollution in our waterways from medications taken by people. Oxfordshire Community Action Groups is a network of over 100 community action groups working in local communities across Oxfordshire to make it a safer, fairer, greener, more sustainable place to live, work and visit.

***Potential Measure 85: Offer courses, spaces, and opportunities for people of all ages to connect with nature and learn about nature recovery and practice environmental stewardship.***

In order to deliver this kind of action, a variety of landowner and land manager projects would need to be enabled and supported in partnership with a range of organisations (where suitable). For example, the creation of visitor centres, of more areas of nature with accessible routes, and more accessible education opportunities for adults and young people that relate to nature recovery (including nature-friendly farming).

Aim to improve awareness of the biodiversity crisis and efforts to address this, and address barriers to involvement so that more people from across all communities are taking action for nature. This

can include opportunities around the identification and recording of species and habitats to contribute towards our understanding of local biodiversity.

## Unmapped Species Measures

### *Potential Measure 201: Take action for Great-Crested Newt*

Create or maintain fish free ponds, which ideally are within 1km of other ponds that could support Great Crested Newts.

### *Potential Measure 203: Take action for Breeding waders*

Create (and maintain) areas of grassland with extensive, shallow, water during breeding months including reeds and greater pond sedges for nesting. Manage habitats with grazing (ideally) and exclude and manage predators.

### *Potential Measure 204: Take action for Curlew*

Manage nesting fields for Curlews and protect their nests from predation using predator control, electric fencing and/or other techniques which increase Curlew breeding success to hatch, rear, and fledge chicks.

### *Potential Measure 205: Take action for Farmland birds*

Support farmland birds in fields, field margins, and hedges by providing nesting sites, chick rearing food, adult food, and overwinter food for the target bird species.

### *Potential Measure 206: Take action for Montagu's Harrier*

Locate and protect the nesting sites of breeding Montagu's Harriers on farmland fields. Landowners and local organisations can work together to monitor nesting birds and secure their breeding success.

### *Potential Measure 209: Take action for Swifts and House martins*

Provide new nesting spaces that are suitable for Common Swifts and House Martins and do not disturb, remove nests, or try to limit these birds from nesting.

### *Potential Measure 210: Take action for Tawny Owls*

Provide nesting holes and/or boxes for Tawny Owls

### *Potential Measure 211: Take action for Turtle Doves*

In appropriate areas on, or near to farmland, create and manage scrub with trees and habitats that support Turtle Doves.

### *Potential Measure 218: Take action for Moths of Dyer's Greenweed*

Manage meadows to increase populations of Dyer's Greenweed for moths by preventing scrub and grasses outcompeting this plant.

***Potential Measure 228: Take action for White clawed crayfish***

Conserve remaining White Clawed Crayfish populations by managing the river habitat and improving water quality. Also look for suitable sites to expand their range.

***Potential Measure 235: Take action for Ellipteroides alboscutellatus***

Increase the presence of the moss (Palustriella commutate) in tufa springs with open woodland. Moss growth could be encouraged by managing woodland to achieve consistent, partially shaded seepages along tufa springs.

***Potential Measure 242: Take action for bats***

Design, create, and enhance wildlife corridors to support bats (in both urban and rural areas).

***Potential Measure 244: Take action for Beaver***

Reintroduce beavers into suitable locations where they are given space and time to naturally restore river diversity and wetland ecosystems.

***Potential Measure 246: Take action for Hedgehog***

Manage gardens, parks, urban environments, and new developments for hedgehogs.

***Potential Measure 247 and 248: Take action for Otter***

Prevent otters from drowning in traps by ensuring that any fish and crayfish traps being used are legally compliant and have properly-fixed otter guards.

In locations where there are regular otter roadkills, consider adapting infrastructure to improve their chances of survival as they move across land and watercourses.

***Potential Measure 255: Take action for Greater Water-Parsnip***

Propagate and translocate Greater Water Parsnip out to locations to restore its historic distribution in Oxfordshire.

***Potential Measure 258: Take action for Long-Leaved Helleborine***

Maintain permanent areas of suitable glades, rides, or open spaces within woodlands where long-leaved helleborine are present.

***Potential Measure 262: Take action for Adder***

Create new Adder habitats with mosaic areas of heathland, scrub, grassland, and woodland. Or manage and enhance existing mosaics to reintroduce adders.

***Potential Measure 263: Take action for Common lizard***

Carefully manage habitat near known lizard colonies to create open, sunny places in dry, exposed sites with areas of dense cover nearby where they can feed on spiders and insects.

# Documentation

***Oxfordshire Local Nature Recovery Strategy***

For more information and to download the full documentation please visit:

Oxfordshire LNRS website

Oxfordshire LNRS Description of LNRS area - short summary

Oxfordshire LNRS Biodiversity priorities

Oxfordshire LNRS Species priorities

Oxfordshire LNRS online map

Oxfordshire LNRS shapefile download