Statement of Biodiversity Priorities

Oxfordshire's Local Nature Recovery Strategy

Draft version 06 September 2024

OXFORDSHIRE COUNTY COUNCIL

Contents

Local Nature Recovery Strategy (LNRS) Statement of Biodiversity Priorities.

Oxfordshire. Final version, October 2025.

Introduction

'Biodiversity' is a term that refers to the variety of all life forms or 'species' including plants, animals, fungi, and micro-organisms. A stable and healthy variety of species provides a wide range of benefits that enable people to survive, from fresh water, clean air, and climate regulation to food, medicines, mental and physical wellbeing and more. These benefits do not typically come from individual species but from a rich variety of species working together and interacting with each other in their natural habitats (ecosystems).

What is the Statement of Biodiversity Priorities?

In 2023, authorities across England were asked by Government to start developing Local Nature Recovery Strategies (LNRSs) to publish in 2025. This was a requirement from the Environment Act 2021. The Act also explained that the written statement of biodiversity priorities must include:

- a description of the strategy area and its biodiversity (which can be found as one of our key LNRS documents called the 'Description of Strategy Area')
- a description of the opportunities for recovering or enhancing biodiversity in the strategy area
- the priorities for recovering or enhancing biodiversity (found within this document, taking into account the contribution that this can also make to other environmental benefits)
- proposals for potential measures relating to those priorities (found within this document. The potential measures which are specific to particular species can be found on the LNRS 'Species Priorities List').

This Statement of Biodiversity Priorities sets out priorities for biodiversity that are of great importance to achieve locally and indicates which wider benefits could be achieved (See Appendix A). The 'priorities' are the outcomes that collectively, would result in the recovery of nature across Oxfordshire. Each priority, listed below, has a set of 'potential measures' with them which are the actions that need to be taken to achieve the priority outcome.

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

- Actions to create, improve, or restore habitats (expanding and/or enhancing habitat or changing management practices to better support biodiversity)
- Actions needed to benefit specific local species*

Actions to connect up habitat areas to improve the resilience of nature and enable species to move through the landscape

* Local species in this document means those that are already present in (or near) an area, and those that could become local or present in or near that area (considering those species that may migrate or move, and species that may be translocated or introduced to suitable habitats).

Is every potential measure mapped onto the Local Habitat Map?

Not all the measures have a specific location mapped for their delivery. The table below indicates whether a 'potential measure' (an action) could be undertaken "countywide" or whether the measure is "mapped" to specific locations. If a measure is labelled "mapped", then this means that specific areas have been identified on the LNRS Local Habitat Map as priority locations to deliver the measure. These locations are prioritised because they are expected to provide the greatest benefits for biodiversity and help to focus delivery in a way that would create a more resilient, connected network of nature in Oxfordshire. Typically, the mapping helps to expand existing areas that are important for biodiversity, buffer areas, and join up existing areas of importance to biodiversity. Whilst some measures are mapped to such locations, the measures could also be delivered in other suitable locations within the county. The measures do not have to be restricted to the mapped locations since actions outside of the mapped areas would still support the recovery of nature, just perhaps not to the same extent as the mapped network. Although care has been taken to map actions which are expected to be suitable for the soil type and location, all sites must still be assessed on-the-ground to ensure that the site is suitable for the proposed actions, including compliance with regulations such as those related to heritage.

At present, it has been feasible to map prioritised locations for about half of the listed measures. Some are not mapped and this is usually because they could be delivered, to great benefit, in many different locations across the county, or because we do not currently have sufficient data to map them. This does not mean they are of less importance than mapped measures. These unmapped, countywide measures should also be supported and delivered in suitable locations.

How to navigate this document?

On the next page, you will see the table which contains 40 biodiversity 'priorities' and 85 'potential measures'. The measures are actions that could be taken to achieve their relevant priorities. The priorities are grouped into sections, mostly by habitat type e.g. 'Grasslands (including scrub) and road verges'. Each priority and each potential measure also has an identification code which increases in numerical order (e.g. 'PM01', 'PM02' and so on) so that you can more easily look up codes for measures shown on the Local Habitat Map to find further information. Links are included throughout this document to help readers find useful guidance on how to create or improve habitats but you can search for alternative guides, for example here and we recommend you seek expert advice before planning a nature recovery project.

A note on climate change

At the time of writing, the below actions were expected to be the most suitable ways to support the recovery of these habitats. However, there are expected changes to climate patterns with warmer, wetter winters and hotter, drier summers predicted, as well as increasing extremes in weather events and storms, although the exact nature of the changing patterns may be unpredictable. The LNRS recommends that the actions

listed below should be adapted, if necessary, based on the latest understanding of climate change in order to best support the recovery of these habitats in Oxfordshire.

How was this list made?

This ‘Statement of Biodiversity Priorities’ was produced by first collecting the actions and priorities from local people and organisations, grouping them into themes e.g. ‘create meadows’, ‘improve river condition’, and filtering out those which didn’t relate to habitat creation or enhancement. These were then refined into the priorities and measures by local experts from a range of organisations. For more information on the process, Appendix D, and the Oxfordshire County Council’s LNRS website.

The next pages list the Statement of Biodiversity Priorities and the potential measures in a table.

Statement of Biodiversity Priorities

#	**Priority** **In bold you will find the priority. A priority is a key outcome to achieve for Oxfordshire.** Underneath the priority, you will see some wider benefits which could be delivered by achieving each priority.	# **The code of each measure (and whether they are mapped)**	**Potential Measure (PM)** **In bold you will find the potential measure (action) that, if taken, would be expected to contribute towards achieving the priority (left).** Underneath the potential measure you will find further information.
Existing areas of particular importance for biodiversity (APIBs) You can see these areas identified on the LNRS Local Habitat Map [LINK].			
P1	**Enhance the ecological condition of Oxfordshire's existing designated sites and irreplaceable habitats. Aim to achieve good ecological condition.** Wider benefits: Recreation and leisure, Aesthetic value, Education and knowledge, 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, Pollination, Pest control.	PM01 (mapped)	**Enhance and maintain existing areas that are particularly important for biodiversity in Oxfordshire.** 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 the Thames Valley Environmental Records Centre 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.
	Connectivity and boundaries		
P2	**Improve the connectivity of habitats and reduce fragmentation. Create and enhance habitats to create more areas of nature that are bigger, better, and more joined up.** Wider benefits: Recreation and leisure, Aesthetic value, Interaction with nature, Sense of place, Erosion protection, Flood protection, Erosion protection, Water quality regulation, Carbon storage, Air quality regulation, Cooling and shading, Noise reduction Pollination, Pest control.	PM02 (countywide)	**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.

		PM03 (mapped)	**Create, maintain, or enhance wildlife passages to reduce habitat fragmentation by roads, rail, and other infrastructure.** Wildlife passages include 'green bridges' as well as other creative solutions that are designed to enable wildlife to move between areas of habitats such as tunnels, viaducts, underpasses, overpasses, stream and river crossings and culverts. Create crossings through new or existing infrastructure that can join up habitats, help wildlife to move across the landscape, stop species from becoming isolated, and also reducing the number of traffic accidents. This handbook describes a range of options like canopy bridges, bat crossings, viaducts and wildlife underpasses, as well as overpasses, adapted culverts, and more. Specific examples of wildlife passages include the Scotney Castle Land Bridge, adder tunnel, and a range of 33 multi-species crossing points including otter ledges in Cornwall. Priority locations for these wildlife passages may change over time as wildlife moves and infrastructure changes. Whilst this version of the LNRS has mapped some key locations of the strategic road network where National Highways could take this action in Oxfordshire, the creation of passages would also be suitable for other road, rail, and infrastructure networks across the county to reduce the fragmentation of habitats and should be supported accordingly.
P3	**Enhance and create wildlife-friendly boundaries that act as habitats to support species to spread through the county.** Wider benefits: Recreation and leisure, Aesthetic value, Interaction with nature.	PM04 (countywide)	**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. Target habitats: UK Hab Species-rich native hedgerow h2a5, or habitats with additional secondary code 114 (dry stone wall), 117 (laid hedgerow)

Grassland (including scrub) and road verges			
P4	**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.** Wider benefits: Food production, Recreation and leisure, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Erosion protection, Water quality regulation, Carbon storage, Pollination, Pest control.	PM05 (mapped)	**Create areas of calcareous species-rich grasslands in suitable locations, particularly slopes.** 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 locations were regularly mentioned by people and organisations for this action to occur, however this is not an exhaustive list: White Horse Hill and Hackpen Hill, steep calcareous banks and slopes, Berkshire Downs border. Target habitats (UK Habs codes): lowland calcareous grassland (g2a including g2a5 and g2a6) National Vegetation Classification (NVC) CG1-CG7
		PM06 (mapped)	**Create areas of neutral species-rich grasslands in suitable locations** 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.

			Target habitats (UK Habs codes): lowland meadows (g3a including g3a5 and g3a6) and other neutral grassland (g3c, only where it qualifies as species-rich grassland – secondary code 18) National Vegetation Classification (NVC) MG4, MG8, and MG5 and species-rich examples of MG1,MG6, MG9 and MG10.
		PM07 (mapped)	**Create areas of species-rich acid grasslands in suitable locations** Acid grasslands can be created on suitably sandy and acidic soils. These grasslands are characterised by short fine grasses and patches of bare soil which support a particular range of insects, spiders, and reptiles. Acid grassland is also strongly associated with heathland and these two habitat types are rare in Oxfordshire. See management guidance and handbooks for further details. Some examples of acid grassland in Oxfordshire can be found in areas including Boars Hill, Frilford Heath, and Shotover. Target habitats (UK Habs codes): lowland dry acid grassland (g1a6) National Vegetation Classification (NVC) U1-U4

		PM08 (mapped)	**Create varied physical ground structure when creating new grassland habitats.** Whilst creating new grasslands, consider using techniques to create a varied physical ground structure similar to the lumps and bumps of historic delves. Seek opportunities to keep areas of thin skeletal soils as well as areas of rocky, bare, and disturbed ground with a variety of aspects and gradients. Aim to support varieties of sward heights suitable to the location and local species. These actions can be taken whilst creating new grassland habitat (including quarry restoration). This guide gives some examples of the varied features that may be found in grassland habitats.
		PM09 (mapped)	**Create new areas of lowland meadow by creating and restoring meadows in suitable locations (particularly on floodplains).** 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 and 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. Target habitats (UK Habs codes): lowland meadows (**g3a5 and g3a6)**, National Vegetation Classification (NVC) MG4, MG8, and MG5
P5	**Enhance and manage existing grasslands to achieve and maintain species-rich grasslands that are in good ecological condition (long-term).** Wider benefits: Food production, Recreation and leisure, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Erosion protection, Water quality regulation, Carbon storage, Pollination, Pest control	PM10 (mapped)	**Enhance (or maintain a good condition of) existing calcareous grassland.** 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 guidance on management 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.

			Target habitats (UK Habs codes): lowland calcareous grassland (g2a, including g2a5 and g2a6) National Vegetation Classification (NVC) CG1-CG7
		PM11 (mapped)	**Enhance (or maintain a good condition of) existing neutral species-rich grasslands** 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. Target habitats (UK Habs codes): lowland meadows g3a (including g3a5 and g3a6) and other neutral grassland g3c only where it qualifies as species-rich grassland – secondary code 18) National Vegetation Classification (NVC) MG4, MG8, and MG5 and species-rich examples of MG1,MG6, MG9 and MG10.
		PM12 (mapped)	**Enhance (or maintain a good condition of) existing acid grasslands** Use suitable techniques like grazing, or cutting if grazing cannot be arranged, to enhance the condition and diversity of acid grassland. On acid grassland, aim to create and manage a variety of sward heights including areas of short sward with bare ground and soil disturbance. See more detailed management guides to better understand what might be suitable on a given site. Ensure that grazing or cutting includes the removal of the cuttings to prevent nutrient levels from building up. Ensure that a thick thatch of grassy matter doesn't develop to increase nutrients, suppress wildflowers, or create a fire risk. There are some examples of these types of habitats found across Boars Hill, Frilford Heath, Shotover and other areas in Oxfordshire.

			Target habitats (UK Habs codes): lowland dry acid grassland (g1a6) National Vegetation Classification (NVC) U1-U4

		PM13 (countywide)	**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.
		PM14 (mapped)	**Enhance existing lowland meadows through grazing, cutting, or a combination to increase and support species diversity (particularly for floodplain and MG4 habitats).** 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. Target habitats (UK Habs codes): lowland meadows (g3a5 and g3a6), National Vegetation Classification (NVC) MG4, MG8, and MG5
		PM15 (countywide)	**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. A particular location within Oxfordshire where you can see this being practiced is FAI farm in Wytham.

P6	**Create and retain more area of scrub and pockets of 'messier, less tidy' habitat for their importance to biodiversity.** Wider benefits: Education and knowledge, Interaction with nature, Carbon storage, Flood protection, Erosion protection, Air quality regulation, Cooling and shading, Pollination, Pest control.	PM16 (countywide)	**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. A large number of locations were mentioned by people and organisations for this action to occur and this should be applied to all appropriate grasslands including parish nature reserves and local projects where suitable land has been acquired to allow nature to recover itself. Target habitats (UK Habs codes): Dense scrub (h3 - except for h3c and h3g), grassland (g) with secondary code – 10 (scattered scrub). National Vegetation Classification W21, W22
		PM17 (mapped)	**Manage existing areas of scrub to create a varied age and physical structure including glades and scalloped edges**. 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 Natural England's guide on scrub management. or see here for some examples of managing scrub on chalk grassland. Target habitats (UK Habs codes): Dense scrub (h3 - except for h3c and h3g), grassland (g) with secondary code – 10 (scattered scrub). National Vegetation Classification W21, W22

P7	**Create and enhance more road verges that are managed to allow wildflowers to grow in safe locations across Oxfordshire**. Wider benefits: Aesthetic value, Sense of place, Erosion protection, Carbon storage, Pollination, Pest control.	PM18 (mapped)	**Enhance (or maintain a good condition of) existing grassland around roads and infrastructure including road verge nature reserves (RVNR) to increase biodiversity.** This measure can apply to embankments, road verges, roundabouts and other suitable areas of grassland in both urban and rural settings. Manage the cutting regime flexibly for these grassland areas based on the species that are present or that could become present to allow them to grow, flower, and set seed. Over time, this management helps to make the verge less grass-dominant, and will create a lower growing, more diverse verge/habitat which should require fewer cuts. Reducing cutting patterns can help to support a greater range of wildlife including insects. Where road verges and other areas are already being managed in this way, continue to do so in safe and suitable locations where vegetation and any cuttings do not reduce the safety of road or path users (i.e. they do not block paths, roads, or lines of sight). After cutting, the best practice is to collect any arisings and remove them to reduce nutrient levels and promote floristic diversity. Ensure that enough management is undertaken to avoid any unintended scrub encroachment. You can access further urban grassland and road verge guidance here. Target habitats (UK Habs codes): lowland meadows (g3a6) and other neutral grassland (g3c) only where it qualifies as species-rich grassland – secondary code 18. National Vegetation Classification (NVC) MG5, and lowland calcareous grassland (g2a) and other calcareous grassland (g2c) only where it qualifies as species-rich grassland – secondary code 18 National Vegetation Classification (NVC) CG1-CG7, and Lowland dry acid grassland (g1a6) National Vegetation Classification (NVC) U1-U4

		PM19 (countywide)	**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. Target habitats (UK Habs codes): lowland meadows (g3a6) and other neutral grassland (g3c) only where it qualifies as species-rich grassland – secondary code 18. National Vegetation Classification (NVC) MG5. Lowland calcareous grassland (g2a) and other calcareous grassland (g2c) only where it qualifies as species-rich grassland – secondary code 18 National Vegetation Classification (NVC) CG1-CG7. Lowland dry acid grassland (g1a6) National Vegetation Classification (NVC) U1-U4
		PM20 (countywide)	**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.

P8	**Improve the abundance and range of grassland and scrub species that need specific additional potential measures**	N/a	See the 'Species Priorities List' [LINK] to see the potential measures that could be taken to support species that use and benefit from habitats within this type of environment. Some of these measures are mapped.

	Wider benefits: Education and knowledge, Interaction with nature, Sense of place, Pollination, Pest control.		
Heathland			
P9	**Enhance the condition of Oxfordshire's existing pockets of lowland heathland** Wider benefits: Recreation and leisure, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Erosion protection, Pollination, Pest control.	PM21 (mapped)	**Enhance (or maintain a good condition of) existing heathland.** Manage heathland areas to enhance their condition and structural diversity in Oxfordshire. Aim to retain or create a mosaic of vegetation types and prevent rapid colonisation of the heathland by excessive amounts of scrub, bracken, or woodland (through creating or retaining some pockets of scrub can be beneficial to structural diversity). There is more detail on how to achieve this kind of balance in a manner that is suitable to your site here. Grazing is the preferred management tool for maintaining a heathland mosaic but other techniques may be required. Incorporate actions to support any specialist species that are, or could become, present in the area. Preventing nutrient enrichment is important in this habitat type and it can be important to prevent some activities that present particular challenges to heathland success (trampling and disturbance). An overview of heathland management techniques can be found here by Buglife. Detailed heathland management guides from Natural England can be found here. The government outline how to manage lowland heathland for those using Countryside Stewardship. There are some examples of these types of habitats including Boars Hill, Frilford Heath, and Shotover. Target habitats (UK Habs codes): lowland heathland (h1a) National Vegetation Classification (NVC) H1 and H2 including any m16 wet heath if present.

P10	**Create (or restore) areas of lowland heathland in Oxfordshire**. Wider benefits: Recreation and leisure, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Erosion protection, Carbon storage, Pollination, Pest control.	PM22 (mapped)	**Create new areas of heathland on suitable soil types**. Create new areas of heathland with a commitment to long term management. The opportunities in Oxfordshire are very limited for this habitat creation because the type of soil and site requirements are very specific. Aim to create a diversity of vegetation structure with a variety of habitat niches including patches of bare soil. This guide includes information from Natural England about heathland creation for wildlife. Check government websites for payments for farmers e.g. to create heathland here. Target habitats (UK Habs codes): lowland heathland (h1a) National Vegetation Classification (NVC) H1 and H2
P11	**Improve the abundance and range of species that need specific additional potential measures within heathland habitats.** Wider benefits: Education and knowledge, Interaction with nature, Sense of place, Pollination, Pest control.	N/a	See the 'Species Priorities List' to see actions that could be taken to support specific species in Oxfordshire that are threatened or near-threatened with extinction. Some of these species actions are mapped to particular locations.

Mixed habitats including wood pasture, parkland, orchards, and open mosaic habitats			
P12	**Enhance and manage existing habitats to support biodiversity and to enhance their ecological condition. This includes wood pasture, parkland, orchards, open mosaic habitats, and mosaic habitats, which have a mixture of habitat types within a given area.** Wider benefits: Food production, Wood production, Recreation and leisure, Aesthetic value, Interaction with nature, Education and knowledge, Sense of place, Carbon storage, Air quality regulation, Cooling and shading, Pollination, Pest control.	PM23 (mapped)	**Enhance (or maintain a good condition of) existing wood pasture and parkland to support local species and future climates.** Within wood pasture and parkland, manage the habitats and 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. Many locations were regularly mentioned by people and organisations for this action to occur however this is not an exhaustive list of existing parks and estates: Ashdown Park, Ditchley Park, Blenheim Park, Broughton Castle, Glympton Park, Kiddington Park, Heythrop Park, Middle Barton and Sandford St. Martin Park, Watlington Park, Kirtlington Park, Bletchingdon Park, Tusmore and Shelswell Parks, Coleshill Park and Buscot Park, Faringdon, Barcote and Pusey, Cornbury Park, Eynsham Hall, Shotover House. Target habitats (UK Habs codes): grassland, woodland, heath or wetland with secondary code 26

		PM24 (countywide)	**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.
		PM25 (countywide)	**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 here.

		PM26 (mapped)	**Improve (or maintain a good condition of) existing orchards for biodiversity.** 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. Target habitats: UK Habs codes grassland or woodland with secondary code 27
		PM27 (countywide)	**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.

			Target habitats (Uk Habs codes): grassland, woodland, wetland, heathland, urban, sparsely vegetated land or rivers and lakes with secondary code 80
		PM28 (countywide)	**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.
P13	**Create more areas of mixed habitat in Oxfordshire including wood pasture, parkland, orchard, and open mosaic habitats to support biodiversity**. Wider benefits: Food production, Wood production, Recreation and leisure, Aesthetic value, Education and knowledge, Sense of place, Carbon storage, Air quality regulation, Flood regulation, Erosion regulation, Water quality regulation, Cooling and shading, Pollination, Pest control.	PM29 (mapped)	**Create (and manage) areas of new parkland and wood pasture, planning to produce future ancient and veteran trees.** 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. Target habitats (UK Habs codes): grassland, woodland, heathland or wetland with secondary code 26
		PM30 (mapped)	**Create new areas of habitat that contain a matrix of habitat types including small woodland patches, scattered trees, scrub, and grassland.** 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.
		PM31 (countywide)	**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. Target habitats: UK Habs codes grassland or woodland with secondary code 27

P14	**Create more, large, connected, functioning areas of ecosystems that contain a matrix of diverse habitat types within them to create rich, biodiverse natural spaces**. Wider benefits: Food production (wild), Wood production, Water supply, Recreation and leisure, Education and knowledge, Interaction with nature, Sense of place, Flood protection, Water quality regulation, Carbon storage, Air quality regulation, Cooling and shading, Noise reduction, Pollination, Pest control.	PM32 (countywide)	**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. This action could be delivered at a range of scales across a range of locations, not all locations can fit on this list. Some examples were regularly mentioned by people and organisations including: Gibbets Close Hill, Witney and the Bernwood Otmoor Ray area where proposals are underway to create a strategic landscape-scale project to

			connect the Otmoor, Bernwood, and Ray Nature Recovery Area across county borders.

P15	**Improve the abundance and range of species that need specific additional potential measures within mixed habitats including wood pasture, parkland, orchards, and open mosaic habitats.** Wider benefits: Education and knowledge, Interaction with nature, Sense of place, Pollination, Pest control.	N/a	See the 'Species Priorities List' to see the potential measures that could be taken to support species that use and benefit from these habitat types. Some of these measures are mapped.
Woodlands			
P16	**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.** Wider benefits: 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,	PM33 (mapped)	**Enhance existing woodlands to achieve a diverse structure and good ecological condition, suitable for the woodland type, age, and nearby species**. 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

	Cooling and shading, Noise reduction, Pollination, Pest control.		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. This action is suitable for all woodlands. Diverse woodlands can be found across Oxfordshire with particular examples in Wychwood Forest, Waterperry, Shabbington Woods, Shotover, and Brasenose Wood but there are many more. Target habitats (UK Habs codes): lowland beech and yew woodland (w1c), wet woodland (w1d), lowland mixed deciduous woodland (w1f), other broad-leaved woodland (w1g). National Vegetation Classification W1, W5, W6, W7,W8, W10, W12, W13, W14, W15, W16
		PM34 (countywide)	**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.
		PM35 (mapped)	**Enhance existing ancient woodland to improve structural diversity, woodland condition, and benefit local species**. 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. Target habitats (UK Habs codes): woodland habitats with secondary code 28

		PM36 (mapped)	**Enhance the biodiversity value of existing ancient woodlands that are 'plantations on ancient woodland sites' (PAWS).** Create a management plan specific for the site to steadily remove plantation trees from 'plantations on ancient woodland sites' (PAWS) and restore the woodland ecosystem back towards native woodland trees where possible. A sudden removal of all plantation trees could damage relict ancient woodland features like any remaining

			veteran trees and/or ground flora. Selective felling of plantation trees around any such remaining, relict features can support the survival of veteran trees, encourage natural regeneration and floristic diversity, and/or prevent overshading within the woodlands depending on the species present. Target habitats (UK Habs codes): woodland habitats with secondary codes 28
		PM37 (countywide)	**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. Target habitats (UK Habs codes): woodlands with secondary code 210 or 211

P17	**Create new, diverse woodlands in Oxfordshire that mature into good ecological condition and are managed to support biodiversity.** Wider benefits: Food production (wild), Wood production, Recreation and leisure, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Flood protection, Erosion protection, Water quality regulation, Carbon storage, Air quality regulation, Cooling and shading, Noise reduction, Pollination, Pest control	PM38 (mapped)	**Create new woodland by planting trees (or enabling their natural regeneration) using species that are suited to the soil type and site conditions**. 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. Target habitats (UK Habs codes): lowland beech and yew woodland (w1c), wet woodland (w1d), lowland mixed deciduous woodland (w1f), other broad-leaved woodland (w1g). National Vegetation Classification W1, W5, W6, W7,W8, W10, W12, W13, W14, W15, W16

		PM39 (countywide)	**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.

		PM40 (mapped)	**Create new areas of wet woodland along rivers, river corridors, and riparian land as appropriate.** 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). Some locations were mentioned by people and organisations thought this is not an exhaustive list. Areas included; around flooded gravel pits, Kirtlington Park, Gallos

			Brook, Priory Mill, Chipping Norton, areas adjoining Radley Pits Local Wildlife Site, Burcot, Little Wittenham, and Shillingford. Target habitats (UK Habs codes): wet woodland w1d (w1d5) National Vegetation Classification W1, W5, W6, W7.

P18	**Improve the abundance and range of woodland species that need specific additional potential measures** Wider benefits: Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Pest control.	N/a	See the 'Species Priorities List' to see the potential measures that could be taken to support species that use and benefit from habitats within this type of environment. Some of these measures are mapped.

Rivers, streams, ponds, standing water, and wetland habitats			
P19	**Improve water quality within freshwater habitats across the county to support biodiversity by making clean, healthy, and plentiful water more available in Oxfordshire (rivers, canals, lakes, ponds, ditches, reedbeds, and more).** Wider benefits: Fish production, Water supply, Recreation and leisure, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Water quality regulation.	PM41 (countywide)	**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.
P20	**Enhance and manage existing freshwater habitats in Oxfordshire to achieve good ecological condition and support biodiversity through clean, healthy, and plentiful water (rivers, canals, lakes, ponds, ditches, and reedbeds).** Improving the condition of rivers and freshwater habitats emerged as the top priority for people across Oxfordshire. Wider benefits: Fish production, Water supply, Recreation and leisure, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Flood protection, Erosion protection, Water quality regulation, Carbon storage, Cooling and shading.	PM42 (mapped)	**Restore river diversity and manage rivers and their riparian (riverside) habitats to achieve good ecological condition that supports species**. 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. Target habitats (UK Habs codes): Rivers - priority habitat (r2a)
		PM43 (countywide)	**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.
		PM44 (countywide)	**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. Target habitats (UK Habs codes): Canals (r1e)

		PM45 (mapped)	**Enhance the condition (or maintain a good condition) of lakes in Oxfordshire**. Implement good management techniques across lakes in Oxfordshire to support local species. Across lakes in Oxfordshire, take actions to minimise the input of polluted and nutrient-rich water to the lake from surrounding land-uses, establish and protect marginal habitats, establish quiet zones for wildlife on multiple-use lakes, and if

			relevant consider how fish-stocking and angling activities can be undertaken in a way which is compatible with the wildlife interest. This measure would contribute significantly towards the priority if taken in 'mesotrophic lakes' which are lakes with lower levels of nutrients than 'Eutrophic Standing Waters' and can therefore be particularly rich in plant and invertebrate life but the measure is relevant for all lakes. There are only a few examples of mesotrophic lakes in Oxfordshire found mainly amongst the old gravel pits of the Lower Windrush Valley. Typically, lakes are equal to, or larger than 2 hectares, whilst ponds are typically smaller than 2 hectares (Uk Habs). Therefore, this action has been mapped to standing waterbodies that are 2 hectares or more in size. Target habitats (UK Habs codes): eutrophic lakes (r1a), mesotrophic lakes (r1b)
		PM46 (mapped)	**Enhance existing ponds by undertaking sensitive management and restoration of ponds and pond complexes to improve biodiversity and water quality.** Manage ponds through low intervention techniques that cause minimal damage to local species and where possible, incorporate grazing to manage vegetation. Pond management and 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.

			Target habitats: (UK Habs codes) Standing open water (r1) with secondary code 40, ponds (priority habitat)

		PM47 (countywide)	**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. Target habitats (UK Habs codes): reedbeds (f2e). National Vegetation Classification (NVC) S4
P21	**Enhance and manage Oxfordshire's chalk rivers and streams to achieve ecologically healthy examples of this special and globally rare habitat type.** Wider benefits: Fish production, Water supply, Recreation and leisure, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Water quality regulation, Cooling and shading, Pollination, Pest control.	PM48 (mapped)	**Enhance, restore, or manage chalk rivers and streams to achieve (or maintain a good condition of) physical habitat and water quality.** Undertake appropriate physical habitat restoration of damaged chalk stream habitat seeking expert assessments and advice on the most appropriate techniques, including relevant species actions such as the removal of barriers to fish passage wherever possible. Establish buffer zones of un-intensive land-use and aim to establish diverse wildlife habitat running along the banks of the chalk stream corridors (preferably extending out a minimum of 10 metres either side of the bank) and seek to reduce pressures from agricultural management particularly in chalk stream headwaters. Advice can be sought from the Environment Agency, local catchment partnerships, the Chilterns Chalk Streams Project and from the CaBa chalk stream hub. In Oxfordshire there are a number of chalk streams and action should be taken across them all, some examples of chalk streams include (but are not limited to) Letcombe Brook, Holton Brook, Chalgrove Brook, Lewknor Brook, Cuttle Brook, Hendred Brook, Ginge Brook and Lockinge Brook. Target habitats (UK Habs codes): rivers (priority habitat) (r2a) with secondary code 51. National Vegetation Classification A17.

P22	**Enhance and manage ditches in Oxfordshire more sensitively to create wildlife-rich habitats that support biodiversity**. Wider benefits: Water supply, Flood protection, Erosion protection, Water quality regulation, Cooling and shading.	PM49 (countywide)	**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. Target habitats (UK Habs codes): habitats with secondary code 50

P23	**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.** Wider benefits: Water supply, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Flood protection, Erosion protection, Water quality	PM50 (mapped)	**Enhance existing fens through appropriate management and restoration to achieve good ecological condition.** 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).

	regulation, Carbon storage, Cooling and shading.		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. (1) **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. (2) **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. A detailed management and restoration guide for these fens can be found here. Freshwater Habitats Trust have an Oxfordshire Fens Project to work with communities and landowners across the county, get in touch for advice and support. See some of Oxfordshire fen locations and read more about fens here. 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. You can see more about Oxfordshire's Fen Project here. Target habitats (UK Habs codes): lowland fens (f2a). National Vegetation Classification: Swamp: S3,S5,S6,S7,S8,S12,S13,S14,S19,S22,S23,S28,Tall-herb fen: S25 Fen Mire and Fen Meadow M13,M22,M24
		PM51 (mapped)	**Manage fen buffer areas to create and enhance areas of rough vegetation that help to enhance the condition of the fen habitat** 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 here in the fen management handbook.
		PM52 (countywide)	**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. Target habitats (UK Habs Codes): Alder woodland on floodplains (w1d5). National Vegetation Classification W1, W5.

		PM53 (countywide)	**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.
P24	**Create more, new (or restored) high quality freshwater habitats in Oxfordshire including ponds, lakes, reedbeds, and marsh.** Wider benefits: Fish production, Water supply, Recreation and leisure,	PM54 (mapped)	**Create wetland habitats that contain a matrix of various habitat types suitable for the site (e.g. wet grassland, ponds, ditches, hedgerows, trees, or wet woodland)** 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

	Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Flood protection, Water quality regulation, Carbon storage, Cooling and shading, Pest control.		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. Target habitats (UK Habs codes): Fen, marsh, swamp, grassland, rivers, lakes and wet woodland with floodplain wetland mosaic secondary code 55

		PM55 (mapped)	**Create new, varied ponds in suitable locations across all habitat types to increase biodiversity and create more clean water habitats**. 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). Target habitats (UK Habs codes): Standing water (r1) with secondary code 40 ponds (priority habitat), other temporary ponds and scrapes (r1f6)
		PM56 (countywide)	**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. Target habitats (UK Habs codes): reedbeds (f2e). National Vegetation Classification (NVC) S4

		PM57 (countywide)	**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. Target habitats (UK Habs codes): Fen, marsh, swamp, rivers, lakes with floodplain wetland mosaic secondary code 55

P25	**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. Link and connect these habitats by creating and managing wildlife corridors along rivers and streams, providing natural flood**	PM58 (mapped)	**Create areas of new good quality grazing marsh and enhance (or maintain a good condition) of existing floodplain grazing marsh.** 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

	management services and improved water quality. Wider benefits: Food production, Recreation and leisure, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place, Flood protection, Erosion protection, Water quality regulation, Carbon storage, Pollination.		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. Target habitats (UK Habs codes): grassland, wetland or rivers and lakes with secondary code 19.
P26	**Enhance and manage 'riparian land' (the land running along the sides of our rivers and streams) to achieve good ecological condition to benefit wildlife, enhance freshwater habitats, and create joined-up corridors of connectivity through Oxfordshire.** Wider benefits: Fish production, Recreation and leisure, Flood protection, Erosion protection, Water quality regulation, Cooling and shading, Pollination, Pest control.	PM59 (countywide)	**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.
P27	**Improve the abundance and range of freshwater species that rely on rivers, streams, standing water, and wetland habitats and need specific additional potential measures.** Wider benefits: Fish production, Education and knowledge, Interaction	N/a	See the 'Species Priorities List' to see the potential measures that could be taken to support species that use and benefit from habitats within this type of environment. Some of these measures are mapped.

	with nature, Sense of place, Pest control		

Deadwood			
P28	**Retain more deadwood across all habitat types in Oxfordshire to support a wide range of species.** Wider benefits: Education and knowledge, Interaction with nature, Sense of place, Flood protection, Erosion protection, Carbon storage, Pollination, Pest control.	PM60 (countywide)	**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.

Hedgerows and hedgerow trees			
P29	**Enhance and sympathetically manage hedgerows and hedgerow trees to achieve good ecological condition and support biodiversity.** Wider benefits: Food production, Aesthetic value, Interaction with nature, Sense of place, Carbon storage, Air quality regulation, Cooling and shading, Flood protection, Erosion protection, Water quality regulation, Pollination, Pest control.	PM61 (countywide)	**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. Target habitats (UK Habs codes): Species-rich native hedgerow (h2a5)
P30	**Create more hedgerows across Oxfordshire to support biodiversity**. Wider benefits: Food production, Aesthetic value, Interaction with nature, Sense of place, Carbon storage, Air quality regulation, Cooling and shading, Flood protection, Erosion protection, Water quality regulation, Pollination, Pest control.	PM62 (countywide)	**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. Target habitats (UK Habs codes): Species-rich native hedgerow (h2a5)

Invasive Species

P31	**Reduce damage to local species and habitats from invasive species or unsustainably high populations of species. Reduce the spread of invasive or problematic species across all necessary habitat types.** Wider benefits: Wood production.	PM63 (countywide)	**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: Freshwater-associated species - American Mink, American Signal Crayfish, New Zealand pygmyweed, and Himalayan balsalm. 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. More information about what to do and how to record invasive species can be seen here with research and evidence available to read here.

Wider environment – agricultural (improved grassland and arable) and rural landholdings.

Please note, you may wish to refer to priorities for other habitats in the above sections if they are present on your landholdings (e.g. grasslands and

scrub, woodlands, rivers, floodplain grazing marsh, orchards, and others).			
P32	**Support farm businesses, rural landholdings, and tenant farmers to make more space for nature within the farmed landscape, regenerate healthy soils, incorporate wildlife-rich habitats, include agroforestry, and improve water quality. This would create excellent food/fibre production systems that offer valuable, connected spaces for biodiversity too, enabling species to spread through Oxfordshire's fields, edges, and corridors.** Wider benefits: Food production, Wood production, Water supply, Recreation and leisure, Interaction with nature, Sense of place, Flood protection, Erosion protection, Water quality regulation, Carbon storage, Cooling and shading, Pollination, Pest control.	PM64 (countywide)	**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. Target habitats (UK Habs codes): arable field margins (c1a)
		PM65 (countywide)	**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. Target habitats (UK Habs codes): arable field margins (c1a)
		PM66 (countywide)	**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. Target habitats (UK Habs codes): arable field margins (c1a)
		PM67 (countywide)	**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. Target habitats (UK Habs codes): arable fields – cultivated for annual flora (c1c9)
		PM68 (countywide)	**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. Target habitats (UK Habs codes): winter stubble (c1c5), arable fields - wild bird mix (c1c6), arable field margins (c1a)
		PM69 (countywide)	**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).
		PM70 (countywide)	**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.

P33	**Increase biodiversity within farmland soils.** Wider benefits: Food production, Flood protection, Erosion protection, Water quality regulation, Carbon storage, Pest control.	PM71 (countywide)	**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. Target habitats (UK Habs codes): temporary grass and clover leys (c1b), rye-grass and clover ley (c1b5), Legume-rich ley (c1b6), herb-rich ley (c1b7)
P34	**Increase the number, diversity and health of trees on farmland** Wider benefits: Wood production, Food production, Aesthetic value, Interaction with nature, Sense of place, Flood protection, Erosion protection, Water quality regulation, Carbon storage, Cooling and shading, Pollination, Pest control.	PM72 (countywide)	**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).
		PM73 (countywide)	**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).
P35	**Farm with nature by creating and implementing integrated pest management plans that reduce the need for chemical control of on plants, insects, and/or fungi**. Wider benefits: Food production, Interaction with nature, Pollination, Pest Control.	PM74 (countywide)	**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)
P36	**Improve the abundance and range of species that need specific additional potential measures within agricultural land.** Wider benefits: Education and knowledge, Interaction with nature, Sense of place, Pollination, Pest Control	N/a	See the 'Species Priorities List' to see the potential measures that could be taken to support species that use and benefit from habitats within this type of environment. Some of these measures are mapped.
Wider environment - Archaeological and heritage assets			
P37	**Restore and enhance biodiversity across the landscape in a manner that complements the landscape**	PM75 (mapped)	**Restore biodiversity around heritage assets and scheduled monuments in a complementary manner.** 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

	and historical and cultural features. Wider benefits: Flood protection, Erosion protection, Water quality regulation, Carbon storage, Pollination, Recreation and leisure, Aesthetic value, Education and knowledge, Interaction with nature, Sense of place		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 Historic England.
Wider environment – villages, towns, cities, and green spaces **Please note**, in addition to the measures below, you may also wish to deliver other measures that might be present in your local area (e.g. grasslands, scrub, road verges and road verge nature reserves, woodlands, rivers, orchards, and others). The relevant measures for those habitat types can be found in the above sections of this list.			
P38	**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 (at home, at work, and in parks and gardens) and to realise the wider benefits of nature in urban areas such as urban cooling, reduce surface water run-off and cleaner air.** Wider benefits: Recreation, Aesthetic value, Interaction with nature, Sense of place, Flood regulation, Air quality regulation, Carbon storage, Cooling	PM76 (mapped)	**Create and/or manage greenspaces and habitats in urban areas to enhance their condition to benefit wildlife, improve connectivity, and provide wider benefits.** 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's guidance here 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.

	and shading, Noise reduction, Pollination, Pest control		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.
		PM77 (countywide)	**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.
		PM78 (mapped)	**Create or enhance a mosaic of habitats in a manner and size that complements the current use of the land by the local community.** 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 here). 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.

		PM79 (countywide)	**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.
		PM80 (countywide)	**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.

		PM81 (countywide)	**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.
		PM82 (countywide)	**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.
		PM83 (countywide)	**Create and/or enhance community and local growing spaces, community farms, and allotments to improve soil health and benefit biodiversity.** Take actions to increase biodiversity and improve the health of soils in local growing spaces (farms, orchards, allotments) to enable long-term healthy food production that benefits local people and wildlife. Actions should be supported by local communities and suitable to the type of growing space. Look at guides which offer detail about growing food in community settings, permaculture principles, using water more sustainably and reducing the need for chemicals during food production. The National Allotment Society have lots of supportive information. Options will vary based on the type of site and could include the creation of ponds, hedges, hibernaculum, compost sites, and managing the area in a different or regenerative ways. Actions could also be taken for particular species like birds, bats, frogs, newts, snakes, and toads by creating areas of imperfection, nesting spaces, breeding spaces, and habitats or areas that benefit them.
		PM84 (countywide)	**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.
P39	**Build more awareness of biodiversity and enable more people to join and engage with habitat enhancement, creation, and education initiatives so that more people in Oxfordshire are connected with nature and feel more able to act as stewards for Oxfordshire's current and future environment.** Wider benefits: Recreation and leisure, Education and knowledge, Interaction with nature, Sense of place	PM85 (countywide)	**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.
P40	**Improve the abundance and range of species that need specific additional potential measures within, and around, settlements, people, and buildings.** Wider benefits: Education and knowledge, Interaction with nature, Sense of place, Pollination, Pest Control	N/a	See the 'Species Priorities List' to see the additional potential measures that could be taken to support species that use and benefit from habitats within this type of environment. Some of these measures are mapped.

You have reached the end of the LNRS ‘Statement of Biodiversity Priorities’

Appendices

Appendix A – Wider benefits from nature recovery

The benefits that nature provides to people are often known as 'ecosystem services'. In developing the LNRS we considered how nature recovery priorities could contribute towards delivering 18 ecosystem services. Healthy ecosystems, including plants, animals, soil and water (our 'natural capital) deliver a range of services (Figure A1). These include the provision of food, water, timber and fish, as well as cultural services such as nature-rich green spaces for recreation, beauty, education and interaction with nature. Nature also provides a range of regulating services including the control of floods, erosion, air and water quality, noise and climate, as well as pollination and natural pest control. All these services are described in Table A1.

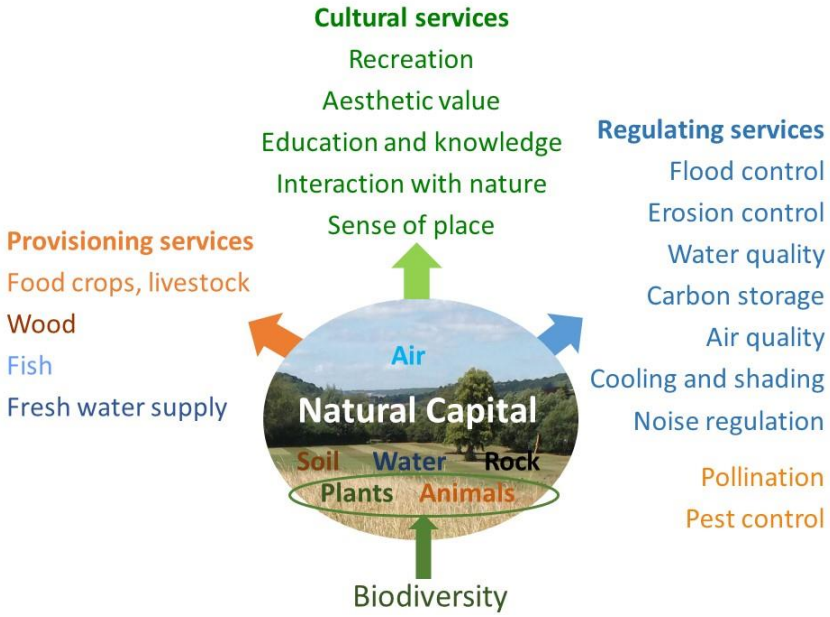


Figure A1. Healthy ecosystems can contribute to 18 ecosystem services.
Source: Alison Smith (2021) 'Natural Capital in Oxfordshire Short report', page 3. Environmental Change Institute, University of Oxford.

Table A1: The 18 ecosystem services that were considered when identifying wider benefits for people from the LNRS.
Source: Alison Smith (2021) 'Natural Capital in Oxfordshire Short report', page 4. Environmental Change Institute, University of Oxford.

Provisioning	**Food production**	Arable crops, horticulture, livestock, orchards, allotments, urban food, wild food (e.g. gathering berries or mushrooms).
	Wood production	Timber, wood production for paper, woody biofuel crops, coppice wood or wood waste used for biofuel.
	Fish production	Aquaculture, commercial fishing, recreational fishing (recreational fishing is also a cultural service, but the habitat conditions match those for fish production).
	Water supply	Impact of soil and vegetation on rainwater runoff and infiltration, and thus on groundwater recharge or surface water flow.
Regulating	**Flood protection**	Reduction of surface runoff, peak flow, flood extent and flood depth through canopy interception, evapotranspiration, soil infiltration and physical slowing of water flow.
	Erosion protection	The ability of vegetation to stabilise soil against erosion and mass wastage by protecting the soil from the erosive power of rainfall and overland flow, trapping sediment, and binding soil particles together with roots.
	Water quality regulation	Direct uptake of pollutants by terrestrial or aquatic vegetation; interception of overland flow and trapping / filtration of pollutants and sediment by vegetation before it reaches watercourses; breakdown of pollutants into harmless forms e.g. by denitrifying bacteria that convert nitrates into nitrogen gas. Also infiltration into the ground, allowing pollutants to be filtered out by the soil and preventing pollution of watercourses – though pollutants could enter groundwater supplies.
	Carbon storage	Carbon stored in vegetation and soil. In the context of land use change (with complete loss of habitats and often major soil disturbance), this is more relevant than carbon sequestered annually. The 'time to reach target condition' reflects the time taken for a new habitat to reach a typical carbon sequestration rate for a mature habitat.
	Air quality regulation	Removal of air pollutants by deposition, absorption and/or breakdown by vegetation. Fine particles ($PM_{2.5}$) are the most damaging type of pollution, but vegetation can also remove ozone and nitrogen oxides (by absorption into pores).
	Cooling and shading	Shade, shelter and cooling effect of vegetation and water, especially urban trees close to buildings, green roofs and green walls, which can reduce heating and cooling costs, or trees in urban parks which can provide shade on hot days.
	Noise reduction	Attenuation of noise by vegetation.
	Pollination	Pollination of crops (and wild plants, supporting other ES) by wild insects (mainly bees and hoverflies). Excludes pollination by managed honeybees.
	Pest control	Predation of crop or tree pests by invertebrates (e.g. beetles, spiders, wasps), birds and bats.

Cultural	**Recreation and leisure**	Provision of green and blue spaces that can be used for any leisure activity, e.g. walking, cycling, running, picnicking, camping, boating, playing or just relaxing.
	Aesthetic value	Provision of attractive views, beautiful surroundings, and pleasing, calming or inspiring sights, sounds and smells of nature.
	Education and knowledge	Opportunities for formal education (e.g. school trips), scientific research, local knowledge and informal learning (e.g. from information boards or experiences).
	Interaction with nature	Provision of opportunities for formal or informal nature-related activities, e.g. bird watching, botany, random encounters with wildlife, or feeling 'connected to nature'. There is some overlap with biodiversity, but access by people can have negative impacts on some wildlife habitats. Excludes recreational fishing; hunting / shooting (not covered); the intrinsic value of nature (covered by the biodiversity metric); existence value (from just knowing that nature exists).
	Sense of place	The aspects of a place that make it special and distinctive – this could include locally characteristic species, habitats, landscapes or features; places related to historic and cultural events, or places important to people for spiritual or emotional reasons.

Within this set of LNRS priorities and measures you will see 'wider benefits' associated with each priority. These are examples of the main benefits that each group of actions could provide alongside achieving the biodiversity priorities. This shows how nature recovery can play a key role in other priorities for the county, including climate resilience, health and well-being, air and water quality, and wider socio-economic benefits. Detailed examples are provided in the sections below.

It is important to understand that the actual benefits delivered will depend on the type of nature recovery action, the type and age of habitat, the location, public accessibility, and a range of other factors. This means that nature recovery actions can be optimised to deliver wider benefits and minimise trade-offs between goals. For example, in urban areas, trees or hedgerows can be positioned to act as air pollution barriers between busy roads and houses or schools. To help protect water quality, buffer strips of tussocky grass, trees and shrubs can be created alongside watercourses to intercept polluted run-off from farmland. Trees can be planted on steep slopes and erodible soils to help reduce soil erosion. Actions such as creating or improving parks, planting street trees, and creating wildflower meadows or community orchards can be targeted in urban areas that currently don't have much green space (see Oxfordshire's greenspace-deprived neighbourhoods).

There can also be trade-offs for some services. For example, planting woodland on farmland will produce benefits for carbon storage and flood protection, but also means it can no longer be used for food production. We have taken account of this when mapping the best locations for each measure. For example, we made it harder for the most productive farmland being selected for habitat creation actions (although some is still included). There are also limits to what nature can do. For example, while nature

recovery can help to absorb carbon dioxide and reduce air and water pollution, this must not distract from the urgent need to reduce emissions and pollution at source, which will have a far greater impact. Indeed, habitats used as a 'buffer' to soak up noise or pollution may have less value for wildlife.

Below are some more detailed examples of how measures in the LNRS can deliver wider benefits for people.

Climate change mitigation

It is estimated that Oxfordshire's soils and vegetation currently store about 85 million tonnes of carbon dioxide. That is equivalent to over 20 times the amount we produce every year by burning fossil fuels (four million tonnes). Oxfordshire's habitats also soak up about 316,000 tonnes of CO2 every year – about 8% of our annual emissions. So while the most urgent priority is to reduce emissions from fossil fuels and other sources, it is also vital to protect and enhance the great amounts of carbon stored in Oxfordshire's habitats. The LNRS can support this priority by prioritising areas to keep existing habitats in good condition and by recommending the creation of new areas of woodland, scrub, grassland, and wetland in places where they offer the greatest benefits for biodiversity too. On farmland, measures such as PM73 (increasing biodiversity in farmland soils) can also help to store a lot more carbon in the soil, and in urban areas measure PM78 (increase tree canopy cover) can also store large amounts of carbon in urban trees.

Climate change adaptation

The LNRS measures can play a key role in helping the county adapt to climate change. One of the main benefits can come from natural flood management, such as by planting trees in upper catchments to intercept and soak up rainwater, reducing flooding downstream (PM35, PM39). Also, rivers can be reconnected to their floodplains (PM40) to allow floodwater to gradually seep into the ground or slowly back into the river, reducing flood peaks in settlements downstream. In urban areas, creating more nature-rich green space (PM77) and tree canopy cover (PM78) can help to cool urban areas and provide shade in heatwaves, as well as soaking up heavy rain and reducing urban flooding. On farmland, measures such as PM73 (increasing biodiversity in farmland soils) can improve the infiltration in the soil, so that heavy rain is absorbed rather than running off the surface, eroding the soil and polluting nearby watercourses. Many of the actions in PM73 also add more organic matter to the soil, which helps it to store more moisture, meaning the soils are more resilient to droughts as well as enabling the land to hold more water and increase infiltration rates into bedrock helping to reduce flooding. Planting and maintaining trees on farmland (PM74 and 75) is very important for providing shade and shelter for livestock in very hot or stormy weather. Hedgerows (PM62 and PM63) also play a valuable role in reducing soil erosion and flooding during extreme weather events. All these farmland measures for reducing the impact of floods, droughts and heatwaves can reduce the economic cost of crop and livestock yield losses for farmers.

Pollination and natural pest control

There has been a dramatic decline in insect populations in the UK over the last few decades, including beneficial insects such as pollinating bees and hoverflies, and pest predators such as beetles, spiders and wasps. This has had a knock-on effect on other species that depend on insects for food, including birds, bats, reptiles and amphibians (frogs, toads and newts) – and these are also natural pest predators. Supporting pollinators and natural pest predators can increase crop yield and reduce the need for farmers to use expensive and dangerous agro-chemicals such as pesticides and herbicides.

Many of the LNRS measures can help to support our struggling pollinators and pest predators by providing habitat and food resources. Measures that create and maintain scrub, wildflowers and dead wood are particularly important, because insects need nectar from flowers as well as structurally diverse (‘messy’) habitats to use for nesting and over-wintering sites. Habitats including tussocky grass, dead hollow stems, leaf litter, different ages of scrub, dead wood, old trees with hollows, flaking bark and crevices, and patches of bare ground are all really valuable. The Oxfordshire LNRS consultation revealed strong support for more of these naturally diverse mosaic habitats. Examples of key measures include PM03 (creating grasslands with a bumpy ground structure and different sward heights), PM05 and PM06 (creating and maintaining flower-rich grasslands), PM07 and PM08 (creating and maintaining varied scrub patches on grasslands), PM17 to PM27 (creating and maintaining mosaic habitats including wood pasture and parkland with veteran trees), PM37 (creating dense shrubby habitat in woodlands), PM60 (creating dead wood habitat), PM61 to PM64 (creating and maintaining hedgerows and walls), PM66 to PM69 (creating flower-rich field margins) and PM76 (integrated pest management to reduce use of agrochemicals).

Human health and wellbeing

There is now strong evidence that nature-rich green spaces can improve human physical and mental health and well-being and can have wider socio-economic benefits. For example, interaction with nature can improve a range of health conditions including heart and lung health, high blood pressure, diabetes, immune function, depression and anxiety. Nature-rich green spaces in and around urban areas can make them a better place to live, work and invest, helping to attract visitors and businesses to the area and improving local economies. Urban trees (PM78) and hedgerows (PM61 to 63) can also help to trap air pollution and act as a noise barrier in urban areas.

Water quality

Improving water quality and improving the health of rivers and freshwater habitats emerged as most people's top priority from earlier workshops and surveys which were held in 2024 to inform the LNRS. The main route for tackling poor water quality is by reducing discharges of untreated sewage however this particular action is beyond the control of the LNRS. Reducing untreated sewage discharges is an action that needs to be enforced by the relevant organisations within industry and by national government which is why it is out of scope of the LNRS. However, some of the LNRS 'potential measures' in the table above can help to reduce water pollution including another source of water pollution – runoff from agricultural fields. Key measures include creating riparian buffers of trees, shrubs and tall, tussocky grassland on the edge of watercourses (PM40), chalk streams (PM45) and ponds (PM43), creating wet woodland in riparian areas (PM38), and creating reedbeds (PM44 and PM53) and wetland mosaics (PM51 and PM54). Measures to reduce soil erosion can also help to stop polluted soil being washed into watercourses: this could include ensuring that new woodlands (PM35), woodland/scrub/grassland mosaics (PM24), tussocky grasslands (PM03) and hedgerows (PM61 to 63) are created on steep slopes, especially where there are soils that are vulnerable to erosion. Finally, there are a number of habitat measures around the freshwater environment that will improve the structure, condition, and diversity of rivers, ponds and wetland habitats although these alone will not directly improve water quality.

Appendix B - The local, regional, and national plans, objectives, and/or strategies that were reviewed as part of the process of choosing potential priorities and potential measures for Oxfordshire's Local Nature Recovery Strategy.

During the development of the Local Nature Recovery Strategy 'priorities' and 'potential measures' you will see that, after we listed priorities and potential measures from workshops and the survey, we then reviewed these against local plans and strategies to add in, or add detail to priorities and measures.

When reviewing strategies or documents, those reviewing them were asked to look for whether any potential priorities, potential measures, particular locations, or particular targets were mentioned that needed to be considered when we finalised our list of priorities, potential measures, and targets for this LNRS. The strategies reviewed included:

National

- National Environmental Objectives
- Environmental Improvement Plan Objectives
- River Catchment management plans
- Water framework directive

Regional, local, and county projects

- Chilterns Nature Recovery Plan (currently being written)
- Cotswolds National Landscape Management Plan
- Chilterns National Landscape Management Plan
- North Wessex Downs National Landscape Management Plan
- Cotswolds Nature Recovery Plan
- National Landscape Target 8
- North Wessex Downs Nature Recovery Plan
- Conservation Target Areas

County Council

- Oxfordshire County Council - Oxfordshire Environmental Principles
- Oxfordshire County Council - Minerals and Waste Local Plan
- Tree Policy for Oxfordshire
- Oxfordshire Net Zero Route Map and Action Plan 2023-2050

District and City Council Local Plans and Green Infrastructure Strategies

- South and Vale District Council Joint Local Plan Preferred Options
- Oxford Local Plan 2036
- Oxford Local Plan 2040 (submission draft)
- Cherwell Green and Blue Infrastructure Strategy
- Salt Cross Area Action Plan - yet to be adopted
- South and Vale Green Infrastructure Strategy
- West Oxfordshire Local Plan 2031 – adopted
- West Oxfordshire Local Plan 2041. Focused Consultation: Ideas and Objectives. Aug 2023
- West Oxfordshire District Council Nature Recovery Plan 2024 – 2030
- Oxford Urban Forest Strategy A Master Plan to 2050 SEPTEMBER 2021

Whilst there was limited resource to review the neighbourhood plans at this stage, Oxfordshire's LNRS has run specific activities and events to engage with the 300+ parish and town councils within Oxfordshire through the Oxfordshire Association of Local Councils. Parish and town councils were encouraged to participate in our surveys and workshops as well as other in-person events so that we could incorporate their priorities and potential measures.

In addition to written strategy documents, many organisations provided the LNRS with further information and data about locations where key activities are being undertaken or could be undertaken including information from Forestry Commission, Freshwater Habitats Trust, BBOWT, and many more. This has been used within our mapping process to create the Local Habitat Map.

Appendix C – project partner representatives who oversaw the priority setting for Oxfordshire.

The priorities and potential measures decision-making was overseen by a group of representatives from each and all of:

- Oxfordshire County Council
- The District and City Councils, biodiversity and planning representatives
- Natural England
- Forestry Commission
- Environment Agency
- Cotswolds National Landscape (representing protected landscapes in Oxfordshire)
- BBOWT - Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust
- Oxfordshire's Local Nature Partnership
- Wild Oxfordshire
- Thames Valley Environmental Records Centre (TVERC)
- Director of the Durrell Institute of Conservation and Ecology (DICE)
- University of Oxford, Environmental Change Institute, Leverhulme Centre for Nature Recovery

Appendix D – How was this list made?

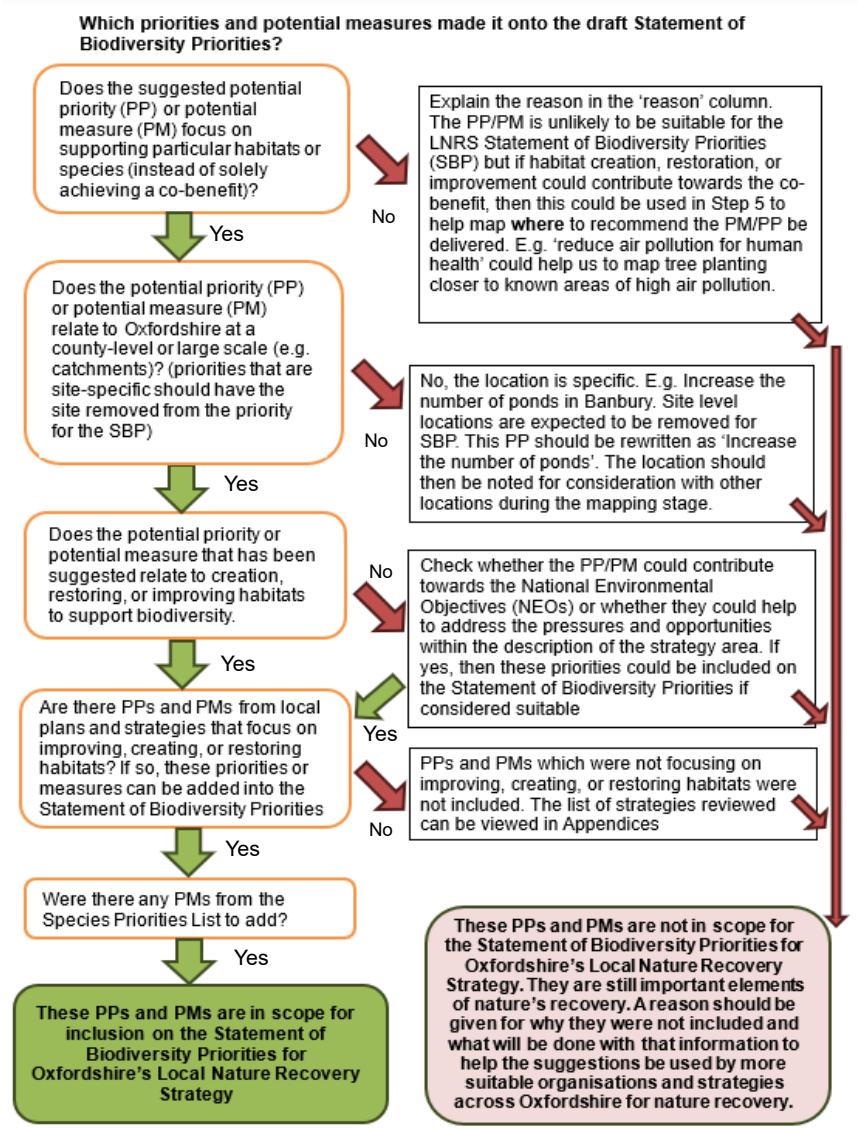
This ‘Statement of Biodiversity Priorities’ was produced by first collecting actions and priorities that were recommended to support biodiversity by local people and organisations who joined our workshops and used our survey in February and March 2024. We received 7,959 mentions of priorities and actions that people wanted to see be achieved in Oxfordshire and these were grouped into themes e.g. ‘create meadows’, ‘improve river condition’. The LNRS was able to include the 4,667 comments that mentioned creating or improving habitats for biodiversity. We were unable to include actions that didn’t relate to habitat creation or enhancement LNRSs are expected to focus mostly on actions to create and/or enhance habitats. The other requests mostly included requests to:

- Stop or reduce house building, developments, and infrastructure
- Regulate, fine, or punish, for poor practice
- Stop the creation of pollution
- Reduce traffic, or pets

Whilst it is beyond the scope of the LNRS to resolve those requests, it is of key importance to nature recovery that each of these issues are addressed by their relevant authorities and organisations.

The image of the flowchart in this document shows the process that was taken to decide whether proposed priorities and potential measures could be included on this list. The full process and further information about the 7,959 comments we received can be viewed on the LNRS website. The strategies that contributed to this process can be found in Appendix B.

In Oxfordshire, the process of agreeing the priorities and potential measures that are included in this document was overseen by representatives from a range of organisations (see Appendix C). These representatives helped to shape and refine priorities and potential measures and helped to sense-check the process whilst reviewing the priorities of local people and organisations from our workshop and survey results. To view further documents and spreadsheets that show how the statement of biodiversity priorities was made in more detail, please view the documents on Oxfordshire County Council’s LNRS website.


Which priorities and potential measures made it onto the draft Statement of Biodiversity Priorities?
Does the suggested potential priority (PP) or potential measure (PM) focus on supporting particular habitats or species (instead of solely achieving a co-benefit)?
No
Explain the reason in the 'reason' column. The PP/PM is unlikely to be suitable for the LNRS Statement of Biodiversity Priorities (SBP) but if habitat creation, restoration, or improvement could contribute towards the co-benefit, then this could be used in Step 5 to help map where to recommend the PM/PP be delivered. E.g. 'reduce air pollution for human health' could help us to map tree planting closer to known areas of high air pollution.
Yes
Does the potential priority (PP) or potential measure (PM) relate to Oxfordshire at a county-level or large scale (e.g. catchments)? (priorities that are site-specific should have the site removed from the priority for the SBP)
No
No, the location is specific. E.g. Increase the number of ponds in Banbury. Site level locations are expected to be removed for SBP. This PP should be rewritten as 'Increase the number of ponds'. The location should then be noted for consideration with other locations during the mapping stage.
Yes
Does the potential priority or potential measure that has been suggested relate to creation, restoring, or improving habitats to support biodiversity.
No
Check whether the PP/PM could contribute towards the National Environmental Objectives (NEOs) or whether they could help to address the pressures and opportunities within the description of the strategy area. If yes, then these priorities could be included on the Statement of Biodiversity Priorities if considered suitable
Yes
Are there PPs and PMs from local plans and strategies that focus on improving, creating, or restoring habitats? If so, these priorities or measures can be added into the Statement of Biodiversity Priorities
Yes
PPs and PMs which were not focusing on improving, creating, or restoring habitats were not included. The list of strategies reviewed can be viewed in Appendices
No
Yes
Were there any PMs from the Species Priorities List to add?
Yes
These PPs and PMs are in scope for inclusion on the Statement of Biodiversity Priorities for Oxfordshire's Local Nature Recovery Strategy
These PPs and PMs are not in scope for the Statement of Biodiversity Priorities for Oxfordshire's Local Nature Recovery Strategy. They are still important elements of nature's recovery. A reason should be given for why they were not included and what will be done with that information to help the suggestions be used by more suitable organisations and strategies across Oxfordshire for nature recovery.